IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

JOINT ADDENDUM:

Exhibits in Support of Movant Respondent-Intervenors' Responses in Opposition to Motions for Stay

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[1] The States of New York, California (by and through Governor Edmund G. Brown Jr., the California Air Resources Board, and Attorney General Kamala D. Harris), Connecticut, Delaware, Hawaii, Illinois, Iowa, Maine, Maryland, Minnesota (by and through the Minnesota Pollution Control Agency), New Hampshire, New Mexico, Oregon, Rhode Island, Vermont, Washington, the Commonwealths of Massachusetts and Virginia, the District of Columbia, the Cities of Boulder, Chicago, New York, Philadelphia, and South Miami, and Broward County, Florida ("State and Municipal Intervenors")

[2] American Lung Association, Center for Biological Diversity, Clean Air Council, Clean Wisconsin, Conservation Law Foundation, Environmental Defense Fund, Natural Resources Defense Council, Ohio Environmental Council, Sierra Club, The West Virginia Highlands Conservancy, the Ohio Valley, Environmental Coalition, Coal River Mountain Watch, the Kanawha, Forest Coalition, Mon Valley Clean Air Coalition and Keepers of the, Mountains Foundation ("Environmental and Public Health Intervenors")

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[3] Calpine Corporation, the City of Austin d/b/a Austin Energy, the City of Seattle, by and through its City Light Department, National Grid Generation, LLC, NextEra Energy, Inc. and Pacific Gas and Electric Company (collectively, "Power Companies")

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Part A

Declarations in Support of State and Municipal Intervenors

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF EDITH CHANG,

DEPUTY EXECUTIVE OFFICER OF THE CALIFORNIA AIR RESOURCES BOARD

I, Edith Chang, declare:

1. I am a Deputy Executive Officer of the California Air Resources Board (ARB), which is the agency charged with implementation of the federal Clean Power Plan in the state of California. I hold a B.S. in Mechanical Engineering from the University of California, Berkeley, and an M.S. in Mechanical Engineering from the University of California, Irvine and am a registered Mechanical Engineer in the State of California. I have more than twenty years of experience at ARB, and have worked on a wide variety of projects, including

implementation of ARB's zero-emission vehicle program, preparation of State Implementation Plans, and diesel incentive programs. My current responsibilities include overseeing ARB's Cap-and-Trade program, and our Clean Power Plan compliance strategy. This Declaration is based upon my experience managing Clean Air Act programs for California.

2. The purposes of this declaration are to: (i) discuss the serious harms that climate change caused, in part, by power sector emissions, is causing and will continue to cause to California unless those emissions are reduced, (ii) demonstrate California's need for greenhouse gas emissions reductions from the power sector; (iii) describe California's success in reducing these and other emissions through state planning, and to compare those planning efforts with the Clean Power Plan's requirements for state compliance plans; and (iv) explain the ways in which California's regulatory efforts will benefit from continued implementation of the Clean Power Plan and the denial of a stay.

I. Climate Change Threatens California, Requiring Immediate Greenhouse Gas Pollution Reductions

3. ARB and the state of California are committed to reducing greenhouse gas emissions in all sectors because climate change poses a pressing threat to public health and prosperity in our state, as well as throughout the world. California's

Office of Environmental Health and Hazards Assessment, for instance, has concluded that climate change is having increasingly negative effects on our state.[1] These effects include:

- A marked increase in extremely hot weather, resulting in increased deaths associated with heat waves. Hotter weather, including increases in extremely hot days, also contributes to ground-level ozone (or "smog") formation, which is linked to asthma, heart attacks, and pulmonary problems, especially in children and the elderly. Smog also reduces visibility, damages crops, and harms wildlife.
- Severe drought and the continuing collapse of the Sierra Nevada snowpack, which is a critical water supply source for California. Indeed, researchers have recently reported that the snowpack recently hit a 500-year low.[2] The drought has already been linked to climate change,[3] and the long-term trend for the

[1] *See* California Office of Environmental Health and Hazards Assessment, *Indicators of Climate Change in California* (2013), available at: http://oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsReport2013.pdf

[2] *See* Monte Morran, "Sierra Nevada Snowpack Is Much Worse Than Thought: A 500-Year Low," *Los Angeles Times*, (Sept. 14, 2015), available at: http://www.latimes.com/science/sciencenow/la-sci-sn-snowpack-20150911-story.html

[3] *See* Justin Gillis, "California Drought is Made Worse by Global Warming, Scientists Say," *New York Times* ("Global warming caused by human emissions has most likely intensified the drought in California by 15 to 20 percent, scientists said …. The odds of California suffering droughts at the far end of the scale, like the current one that began in 2012, have roughly doubled over the past century,

state under worsening climate change points to increasingly severe drought conditions.[4] As a result of the vanishing snowpack and statewide drought, Californians have been forced to significantly curtail water usage, with very substantial economic consequences. Already, California agriculture is experiencing major challenges as a result of the drought,[5] and continued severe drought will imperil both our agricultural sector and our economy generally.

• An increase in the severity and size of wildfires, with resulting lives lost, property damage, air quality harm resulting from the smoke (including from fine particles in the ash), and water quality risks from denuded slopes. This past summer, California experienced some of the most serious wildfires in its history, destroying large portions of entire towns, and many of these fires

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they said."), available at: http://www.nytimes.com/2015/08/21/science/climate-change-intensifies-california-drought-scientists-say.html?_r=0

[4] *See id.* *See also* California Department of Water Resources, "Climate Change," ("Warmer temperatures will cause what snow we do get to melt faster and earlier, making it more difficult to store and use. By the end of this century, the Sierra snowpack is projected to experience a 48-65 percent loss from the historical April 1st average. This loss of snowpack means less water will be available for Californians to use. Climate change is also expected to result in more variable weather patterns throughout California. More variability can lead to longer and more severe droughts."), available at: http://www.water.ca.gov/climatechange/

[5] *See, e.g.*, Dale Kasler, "More California farmland could vanish as water shortages loom beyond drought," *Sacramento Bee* (Nov. 26, 2015), available at: http://www.sacbee.com/news/state/california/water-and-drought/article46665960.html

continued to burn into the autumn. Scientists project increased wildfire risk from climate change in the future.[6]

• Rising sea levels. The ocean has already risen between 6 to 8 inches along the California coast, and much larger increases have been predicted globally over the next century.[7] Sea level rise threatens low-lying cities and infrastructure throughout the state, including the Sacramento/San Joaquin Delta, which is the core of the state's water infrastructure.

• Ocean warming and acidification. In addition to warming of the ocean due to climate change, CO_2 absorbed by the ocean is increasing the acidity of ocean water.[8] This has very negative consequences for California's fisheries

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[6] *See*, Joshua Emerson Smith, "Wildfire risk to rise by six times, study says," *San Diego Union Tribune* (Nov. 8, 2015) ("Climate change will steadily amplify the risk of wildfires in California by six-fold, according to the study, which is published in the current issue of the Bulletin of the American Meteorological Society. The report's authors more specifically quantified increases in extreme fire conditions linked to climate change, a connection that many other researchers had established over the years but in broad terms."), available at: http://www.sandiegouniontribune.com/news/2015/nov/08/wildfires-california-climate-change-yoon-gillies/ ; *see also* Union of Concerned Scientists, *Science Connections: Western Wildfires and Climate Change*, available at: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/Infographic-Western-Wildfires-and-Climate-Change-Methodology-and-Assumptions.pdf.

[7] *See Intergovernmental Panel on Climate Change*, "FAQ 5.1: Is Sea Level Rising?" available at: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/faq-5-1.html.

[8] *See, e.g.*, Nicolas Gruber *et al.*, *Rapid Progression of Ocean Acidification in the California Current System*, Science Express (2012), available at:

and coastal wildlife. Changing ocean conditions have already contributed to a toxic algal bloom that led California to close its lucrative crab fishery this year.[9] We have also seen record strandings of starving marine mammals this year, as warmer waters and changing ocean conditions makes it difficult for them to survive.[10]

4. These are just a sampling of the negative effects California is experiencing. In many regards, climate change, caused by greenhouse gases, threatens the public health and welfare of all Californians. Addressing this issue requires immediate, sustained, and deep cuts to greenhouse gas emissions, including from electric power plants.

5. I have reviewed the discussion of climate change and its impacts in the preamble to U.S. EPA's final "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (the "Clean Power Plan"). U.S. EPA's description of a wide range of scientific studies demonstrating that greenhouse gases endanger public health and welfare is well supported, and is

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https://www.oceanfdn.org/sites/default/files/Rapid%20Progression%20of%20Ocean%20Acidifcation%20in%20the%20California%20Current%20System.pdf

[9] *See* Azure Gilman, "A California crab ban reveals trouble in the Pacific Ocean," *Al Jazeera America* (Nov. 6, 2015), available at: http://america.aljazeera.com/articles/2015/11/6/a-california-crab-ban-reveals-troubled-pacific-ocean.html

[10] *See* Marine Mammal Center, "Unusual Ocean Conditions Continue to Cause Record Strandings" (Nov. 19, 2015), available at: http://www.marinemammalcenter.org/about-us/News-Room/2015-news-archives/record-strandings.html

consistent with California's experience and conclusions. I fully concur with U.S. EPA's analysis, including its finding that "climate change impacts touch nearly every aspect of public welfare" and that "[c]hildren, the elderly, and the poor are among the most vulnerable to … climate-related health impacts."

6. The National Academies of Science,[11] the U.S. Global Change Research Program,[12] and the Intergovernmental Panel on Climate Change,[13] are among the many scientific bodies that have concluded that there is a limited amount of time left to reduce emissions to safe levels. This is, in part, because carbon dioxide, the principal greenhouse gas, persists in the atmosphere for centuries. As a result, every year of additional greenhouse gas emissions results in persistent climate disruption for years to come. Conversely, the earlier we begin to reduce emissions, the more limited future damage from climate change is likely to be.

7. In light of these very serious risks, and the closing window of opportunity to address them, California has long been focused on reducing greenhouse gas emissions. California's Global Warming Solutions Act, AB 32, is one of several statutes directing ARB and other state agencies to take action. It recognizes this

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[11] *See generally* National Academies of Science, *American's Climate Choices* (2011), available at: http://dels.nas.edu/Report/America-Climate-Choices-2011/12781.

[12] *See generally* U.S. Global Change Research Program, *National Climate Assessment* (2014), available at: http://nca2014.globalchange.gov/.

[13] *See generally* Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report, Summary for Policymakers* (2014), available at: http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf

"serious threat" and directs California, and ARB, to support "other states, the federal government, and other countries" as they act to address emissions. *See* Cal. Health & Saf. Code §38501. This effort, supported by California Governors from both major political parties, involves agencies across state government and a wide range of programs.

8. California is currently on track to reduce total greenhouse emissions from all sectors to 1990 levels by 2020. Consistent with available science, California will then pursue emission reductions of 40% below 1990 levels by 2030, and 80% below 1990 levels by 2050.[14]

9. California's emissions reductions experience demonstrates that greenhouse gas emissions reductions can be consistent with economic prosperity. As we have reduced our emissions towards 1990 levels and put our carbon market into operation, jobs grew by 3.3% – outpacing the rest of the country.[15] Personal income and wages are up – again growing at rates well above the national average.[16] Our electric power grid delivers power reliably, resiliently, and

[14] *See* Governor Edmund G. Brown Jr., Executive Order B-30-15 (Apr. 29, 2015), available at: https://www.gov.ca.gov/news.php?id=18938
[15] Environmental Defense Fund, *Carbon Market California* (2014) at 5, available at: http://www.edf.org/sites/default/files/content/carbon-market-california-year_two.pdf.
[16] *Id.*

efficiently thanks to the continued stewardship of our transmission operators.[17] And power bills are down: Californians pay among the lowest power bills in the country – twenty dollars less per month than the national average, and forty dollars less than Texans pay on average.[18]

10. California's experience has not gone unnoticed. Many jurisdictions, international and domestic, are implementing similar programs, and are committing to continue reductions. According to the International Energy Agency, renewable energy will be the single largest source of electricity sector growth over the next five years.[19] By 2020, the IEA expects that the energy coming from renewables worldwide will exceed the energy consumption of China, India, and Brazil combined. California is helping to bring together subnational actors via the "Under 2 MOU" to support this process. To date, 43 jurisdictions in 19 countries and 5 continents have signed. They collectively represent 474 million people, and

[17] *See* California Independent System Operator, *What Are We Doing to Green the Grid?* (2014), available at: http://www.caiso.com/informed/Pages/CleanGrid/default.aspx

[18] Energy Information Administration, *2013 Average Monthly Bill – Residential*, http://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf

[19] IEA, *Renewables to Lead World Power Market Growth to 2020* (2015), available at: http://www.iea.org/newsroomandevents/pressreleases/2015/october/renewables-to-lead-world-power-market-growth-to-2020.html

a GDP of $13.6 trillion – the equivalent of the second largest economy in the world.[20]

11. Although California's emission reductions, and these international efforts, are an important contribution, they alone are not sufficient to fully address global climate change. Doing so requires national and international action. It is clear that United States leadership on this issue is critical, both because national emissions reductions in the United States as a whole can be very substantial, and because United States leadership on this issue will support international climate action.

12. The Clean Power Plan is a critically important part of this necessary national effort. It addresses the largest national stationary source of greenhouse gas emissions, electricity generation, and, according to U.S. EPA's estimates, will generate 32% reductions in emissions from that sector relative to a 2005 baseline. The Clean Power Plan thus makes a very meaningful contribution to reducing United States emissions, and demonstrates the sort of leadership needed to secure further reductions internationally. Benefits from the Clean Power Plan are very significant in all of these regards; indeed, U.S. EPA estimates that the monetized net climate and public health benefits of the plan itself (leaving aside its

[20] *See* http://under2mou.org/?page_id=238.

contribution to international pollution reductions) will be as much as $45 billion by 2030.

13. The Clean Power Plan will also help support and reinforce necessary efforts to reduce other pollutants, including ozone and particulate matter (in lay terms, "smog" and "soot" – both very dangerous to human health). California has significant air pollution challenges that can only be fully addressed by greatly reducing fossil-fuel emissions from all sources, including from power plants. The Clean Power Plan reinforces progress needed to support these reductions in-state and across the country.

14. Securing the full benefits of the Clean Power Plan for California, the country, and the world in the most effective way requires planning for compliance. Any disruptions to the Clean Power Plan have the potential to make it more difficult to achieve cost-effective emissions reductions based upon well-developed plans, resulting in intensified climate change risks, as well as challenges integrating federal programs like the Clean Power Plan with existing state programs.

15. For these reasons, and those discussed more fully below, California would be harmed by any judicial decision delaying Clean Power Plan implementation or decreasing the rigor of the Clean Power Plan.

II. Consistency of the Clean Power Plan's Requirements with Past Planning Efforts

16. One of the significant strengths of the Clean Power Plan is that it relies on the Clean Air Act's successful state/federal planning model, which has helped California and states across the country reduce air pollution for more than forty years. Based on my experience developing California's State Implementation Plans under the Clean Air Act, and on my current responsibilities, I conclude that the Clean Power Plan compliance process is fundamentally similar to the Clean Air Act planning processes that all states have long undertaken, and thus imposes no unique or special burdens on those states that wish to submit their own plans. Instead, it uses highly similar procedures to those that the states successfully employ as a matter of course.

17. Specifically, section 111(d) planning, as envisioned by the Clean Power Plan, is very similar to the planning processes states regularly undertake under Section 110 of the Clean Air Act to meet federal ambient air quality standards for criteria pollutants. That cooperative federalism approach, now in use in the Clean Power Plan, has allowed states to achieve large air pollution reductions while tailoring programs to meet their particular circumstances.

18. Nationally, Section 110 plans (also called State Implementation Plans) and other Clean Air Act programs have reduced aggregate national emissions of criteria pollutants by 72% from 1970 to 2012; during the same period, GDP grew by 219%.[21] This progress has saved, and will continue to save, hundreds of thousands of lives.[22] U.S. EPA reports that monetizing this progress demonstrates $2 trillion of benefits, which exceed costs by a ratio of 30-to-1.[23]

19. Progress in California has also been dramatic. While California's population has increased by 29% since 1990, state and federal clean air planning led to reductions in emissions of ozone-forming pollutant emissions of 50% and toxic pollutants of 80% in that same period.[24] Almost two-thirds of Californians now reside in areas that meet federal ozone smog standards, up from only 24% in 1990.[25]

20. To make this progress, California, like other states, has developed considerable administrative expertise in air pollution control planning. State and

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[21] *See* U.S. EPA, *Progress Cleaning the Air and Improving People's Health* (2013), available at: http://www2.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health

[22] *See id.*

[23] *See id.*

[24] *See* California Air Pollution Control Officers' Association (CAPCOA), *California's Progress Towards Clean Air* (2015), available at: http://www.capcoa.org/wp-content/uploads/2015/04/2015%20PTCA%20CAPCOA%20Report%20-%20FINAL.pdf

[25] *See id.*

local clean air agencies employ expert staffs to develop and implement state plans, and planning is an ongoing and regular part of our duties. California state and local agencies, for instance, have developed nearly fifty Clean Air Act implementation plans under Section 110 of the Clean Air Act since the year 2000 alone. California has also successfully implemented U.S. EPA's past section 111(d) emissions guidelines.

21. For instance, California's efforts to meet section 110 standards for particulate matter (PM 2.5) that poses serious health risks to the "South Coast" region – Los Angeles and environs – demonstrates how state planners regularly address potentially complex clean air planning challenges. U.S. EPA set air quality standards for this pollutant for the first time in 1997; addressing these standards was challenging because particulate matter is created by many pollution sources, and the pollutant itself is made up of many different compounds. The South Coast region was designated as out of attainment with those standards in 2005, starting a three-year clock for plan development. South Coast regional officials and ARB worked with U.S. EPA, and successfully developed a plan for these new standards within only two years. The plan contains an extensive and carefully modeled set of measures, regulatory initiatives, and modeling demonstrations intended to demonstrate attainment, and was developed with extensive stakeholder input. The plan was submitted in 2007. This past year, U.S.

EPA, recognizing the progress made, proposed to find that the South Coast region is now in attainment with the standards.[26] This sort of progress is not unusual: California, like other states, regularly implements comprehensive air pollution plans, and has seen significant pollution decreases as a result.

22. I have reviewed the state planning requirements of the Clean Power Plan. For states that choose to develop their own state plans (which are not required), the Clean Power Plan's requirements are no more demanding than those which the states have already met in previous Section 110 and Section 111(d) plans. Both processes require careful analysis of pollution sources and the effects of proposed regulatory regimes on those sources, and careful modeling to demonstrate emissions trajectories. Thus, the task of plan development under Section 111 will be familiar to agencies experienced in Section 110 planning.

23. In some ways, in fact, section 111 plans are somewhat more straightforward substantively. Notably, section 110 plans, which are focused on attaining ambient air quality levels for particular pollutants typically involve measures that affect many source categories – both stationary and mobile – as well as atmospheric modeling to understand the effect of sources on pollutant levels in the atmosphere. Hence, considerable effort is needed to consider measures and impacts across economic sectors. Section 111 planning, by contrast, focuses on

[26] *See* 70 Fed. Reg. 72,999, 73,000 (Dec. 9, 2014) (describing this procedural history and proposing attainment designation).

pollutants from a single source category, and does not require atmospheric modeling.

24. Further, in some regards, the Clean Power Plan also affords states very significant procedural flexibility as they develop their plans that is not always available in the Section 110 process. For instance, California, along with many other states, urged U.S. EPA to offer a wide range of state plan designs, including "state measures" plans that avoid rendering many state programs directly federally enforceable. U.S. EPA granted this request, providing state planners with a very wide range of designs, including the "state measures" option. This state measures option largely allows states to use new or existing programs and policies which are projected to achieve federally required emissions levels without subjecting those policies to federal enforcement – an important source of flexibility that could allow the use of a wide range of policies to respond to the Clean Power Plan at state discretion, including successful energy efficiency policies. Further enhancing state options, U.S. EPA has also proposed model plans and federal plans that states may use as models, or accept as alternatives.

25. Plan submission and implementation timelines under the Clean Power Plan also afford states more than ample time. U.S. EPA requires only a basic initial submission in 2016 to secure an extension for plan submittal to 2018, if necessary. U.S. EPA has also proposed a range of additional submission options –

including partial, conditional, and parallel processing and approval options – that will further accommodate state planners and their schedules. The fact that plans need not begin to meet compliance period requirements until 2022 further provides administrative flexibility.

26. The full seven years between finalization of the Clean Power Plan and the initial compliance period, the fact that emissions reductions then phase in through to 2030, and the up-to three years allowed for plan submissions, with revisions possible thereafter, provides ample time for ARB to enact and implement an appropriate plan. In contrast, ARB has implemented many highly complex state programs that are more sweeping than the Clean Power Plan in significantly less time. For example, California's economy-wide Cap-and-Trade Regulation, which encompasses all large greenhouse gas emitters in the state, took approximately three years to develop and move into implementation from the time the state determined to move forward with the program in ARB's first climate change Scoping Plan.

27. California's experience is not unique in this regard. In my view, the decades of experience which states have accrued in successfully developing and implementing Clean Air Act compliance plans, the wide array of possible plan designs, and the extended implementation and compliance timelines of the Clean Power Plan all render compliance planning entirely manageable for the Air

Resources Board, as well as for other states that wish to submit their own plans. Experience with the Clean Air Act to date strongly suggests that state plans of this sort will be effective and can be implemented smoothly, just as has generally been true for pollution control planning under the Act.

III. Benefits to California of Uninterrupted Implementation of the Clean Power Plan

28. California is moving ahead to implement the Clean Power Plan in accordance with other planning activities for the post-2020 period. I believe that expeditious, integrated planning in California, and across the country, provides significant benefits.

29. Our planning activities include a "scoping plan" establishing California's overall plans for economy-wide greenhouse gas emissions reductions out to 2030, and amendments to our Cap-and-Trade Regulation, which structures California's greenhouse gas emissions trading market. That market has operating since 2012, and the greenhouse gas emissions compliance instruments traded in the market reflect billions of dollars in value. The market is used to guarantee emissions reductions throughout the state by requiring participants to meet a declining cap on total emissions, under which trading may occur to allow for more economically

efficient compliance. The power plants affected by the Clean Power Plan generally are also covered by our Cap-and-Trade Regulation, and participate in the market.

30. ARB is beginning the planning process to ready the Cap-and-Trade Regulation for the post-2020 period. Providing a clear path forward to market participants is important to provide certainty to market participants, maintain the value of the market for participants, and ensure that the program continues to operate smoothly to produce emissions reductions. The planning process began with a workshop in October 2015, and is expected to unfold throughout 2016, with a final scoping plan and amendments to the Cap-and-Trade Regulation expected to be considered for approval in late 2016 and early 2017, respectively.

31. ARB is integrating its Clean Power Plan compliance planning efforts with our state-level scoping plan and Cap-and-Trade amendments because all of these processes bear on the obligations of affected power plants now participating in the California greenhouse gas emissions trading market. ARB is making significant efforts to ensure that the compliance obligations created by the Clean Power Plan can be smoothly integrated into the state market program. U.S. EPA has provided ample flexibilities in the Clean Power Plan to support this effort.

32. In order to develop a unified post-2020 regulatory plan for the power sector that will also provide market certainty, it is important that the state and federal planning processes move forward together, allowing carbon and power

market participants to fully understand their obligations going forward. A delayed Clean Power Plan compliance process, on the other hand, could create uncertainty in the market, diminishing market efficiency, and could force California to revisit the state-level rulemakings that will move forward from 2015 to 2017, at considerable administrative cost and inconvenience for all parties. For instance, a stay could push Clean Power Plan compliance planning beyond the planning period for the state-level rulemakings – such as by delaying U.S. EPA's ability to reach a decision on California's compliance plan, and by creating regulatory uncertainty around the process of plan development. The result would be that ARB would have to consider moving forward with state regulatory development, but without fully integrating Clean Power Plan compliance and without the benefit of U.S. EPA regulatory decisions on ARB's determinations for a portion of that period. If a stay generated delays beyond the timeline of the state regulatory process, ARB would likely have to reopen closed state regulatory and planning processes to incorporate the delayed federal requirements, and do so very close to the beginning of the post-2020 period. The resulting administrative and market disruption costs have the potential to be significant. Compliance instruments traded in the California market are cumulatively worth billions of dollars, and the market itself contributes to controlling millions of tons of greenhouse gases,

meaning that even small disruptions to the smooth functioning of the market can have large absolute consequences.

33. Our climate planning process also involves substantial efforts to consult with disadvantaged communities. This consultation, including through a formal Environmental Justice Advisory Committee, is focusing on many aspects of ARB's programs, including our post-2020 programs. Here, too, providing stakeholders a comprehensive planning process aids in ensuring a thorough and effective consultation to help address these communities' concerns.

34. This coordination process also involves jurisdictions whose own carbon market programs are linked (in the sense of sharing fungible compliance instruments within coordinated policy designs) to the California market. California's carbon market is currently connected in this way to that of the Canadian Province of Quebec, and other jurisdictions are also exploring linkage. Because the Clean Power Plan compliance process is likely to affect the design of our carbon market, plan development will need to address this linkage as well. For this reason, a unified planning process – that can incorporate linkage considerations – is of considerable importance to avoiding market disruption in other jurisdictions as well and to securing cost-effective greenhouse gas reductions through this growing international effort.

35. Further, the Clean Power Plan compliance strategy for California is being developed at approximately the same time as major planning efforts that will affect our electricity system. One of the state's major electricity grid operators, the California Independent System Operator, will be involved in exploring expanding its power market to embrace power markets in other western states (including Oregon, Utah, and Wyoming) over the 2015-17 period. At the same time, our Public Utilities Commission and Energy Commission will be considering how to implement a new 50% renewable procurement target and other utility planning mandates for the 2020-2030 period. The electricity market shifts required for these programs have the potential to affect power plants regulated under the Clean Power Plan. Accordingly, it is most efficient to develop our compliance strategy in coordination with these electricity system policy efforts; such an effort will best support cost-effective electricity planning, and will also support sensible planning for electrical reliability as these policies are implemented. Again, delaying the Clean Power Plan compliance planning process will make it more difficult to ensure that the power market changes and greenhouse gas emission reduction strategies can relate successfully to each other.

36. Finally, I note that California's successful carbon reduction efforts have been influential in international climate discussions, including both policy efforts amongst subnational entities and in the discussions around the pending Paris

climate negotiations facilitated by the United Nations. Continued successful operation of the California programs, as examples of successful reduction efforts, and as venues to explore policy approaches, is likely to help support efforts worldwide to build upon our efforts. Moreover, international climate negotiations have been strongly influenced towards delivering the pollution reductions necessary by demonstrations that the United States, and individual states, are committed to greenhouse gas emission reduction programs. Accordingly, continued implementation of both our programs and the Clean Power Plan itself, which both help to foster continued international pollution reductions. Delays to implementation may disrupt these international efforts, which are necessary to climate stabilization.

37. Accordingly, California benefits substantially from being able to include Clean Power Plan compliance with its overall planning effort, and can only do so effectively if the Clean Power Plan is not stayed.

38. These potential harms are not likely to be limited to California. Many states are now developing greenhouse gas reduction programs at the state level. These states, too, will benefit from being able to incorporate federal compliance planning into their efforts.

39. California will also experience benefits from expeditious, effective Clean Power Plan compliance efforts nationwide. These benefits include durable state

emission reductions plans, further limiting greenhouse gas emissions endangering Californians. Earlier planning and implementation efforts are also likely to provide opportunities for regional coordination of planning efforts, which could help enhance reductions or reduce costs. Because coordination between state governments takes time, a planning window not shortened by a stay is likely to encourage states to explore and capture these potential benefits.

IV. Harms to California Resulting from a Stay

40. If the Clean Power Plan is stayed, California will experience several serious, and irreparable, harms.

41. First, as I have discussed above, it will be difficult and perhaps impossible to seamlessly coordinate state and federal planning for the post-2020 period in California if the Clean Power Plan is stayed. State-level planning must continue in 2016, but, if a stay is granted, these plans may need to be reopened or adjusted once full federal compliance planning can begin. Moreover, holding the federal compliance planning process so close to 2020, the beginning of the next compliance phase within the state greenhouse gas emissions trading market, will introduce unnecessary market uncertainty, and so may impair the program. The resulting market uncertainty, procedural complexity, and administrative costs

would cause significant harm to California's efforts to develop a unified and effective compliance program.

42. Moreover, staying the Clean Power Plan, or otherwise weakening it, will make it more difficult for state planners to develop durable plans that will deliver the requisite greenhouse gas emissions reductions. During the pendency of a stay, the uncertainty created, along with potential limits on U.S. EPA's implementation abilities, will make it more difficult to move state plans forward with full federal and state involvement in the process. Delays could also create a less certain planning timeline, making it more difficult to coordinate with other state processes. Because thoughtful coordination of this sort is important to effective planning, a stay would make it more difficult to integrate Clean Power Plan requirements into ongoing state processes.

43. Further, any delay to the Clean Power Plan will likely make it more difficult for California and the United States to encourage greenhouse gas reductions from other countries.

44. Critically, if a stay results in further delays to compliance deadlines for the CPP, or to state-level efforts to reduce greenhouse gas emissions, these emissions will likely accumulate in larger quantities in the atmosphere, resulting in increased climate risk to Californians.

45. The net result is that a stay to the plan will impair greenhouse gas reduction efforts at the state, national, and international levels, create uncertainties in California's functioning emissions market, potentially delay compliance deadlines resulting in extended periods of elevated greenhouse gas emissions exacerbating climate risk to California, and impose unnecessary additional planning and process coordination costs on California and similarly situated states.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 4, 2015.

/s/ Edith Chang
Edith Chang, Deputy Executive Officer

California Air Resources Board

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF STUART CLARK

I, STUART CLARK, hereby declare:

1. I am now and at all times mentioned have been a citizen of the United States and a resident of the state of Washington, over the age of 18 years, competent to make this declaration, and I make this declaration from my own personal knowledge and judgment.

2. I am currently employed by the Washington State Department of Ecology (Ecology) as the manager of the Air Quality Program. As manager of the Air Quality Program, I oversee the work of Ecology's Air Quality Program throughout the state of Washington. I have worked in this position for approximately ten years. I have worked with Ecology on air quality issues for

more than thirty years. Ecology's Air Quality Program is responsible for preserving, protecting and enhancing the air quality of the state for current and future generations.

3. As part of my work as the manager of the Air Quality Program, I have been involved in numerous efforts to regulate air quality in the state of Washington including air quality planning, state implementation planning, greenhouse gas emissions reduction programs, regulating the power sector, and coordinating with air/utility regulators. Following EPA's issuance of its final rules establishing greenhouse gas emission standards for power plants under Sections 111(b) and (d) of the federal Clean Air Act (CAA), I have been overseeing Ecology's efforts to comply with those rules.

4. Greenhouse gas emissions are causing climate change on a global and national scale, and in the Pacific Northwest, including Washington. A recent "State of the Knowledge Report," entitled Climate Change Impacts and Adaptation in Washington State, released in December 2013 by Climate Impacts Group, University of Washington, and reinforced in its 2015 assessment, summarizes and presents existing knowledge about the likely effects of climate change on Washington State and the Pacific Northwest. The report states that significant changes in Earth's climate system and the climate

of the Pacific Northwest, including Washington, are projected for the twenty-first century and beyond as a result of greenhouse gas emissions.

5. The changes in regional climate, water resources, and coastal conditions that have been observed are consistent with trends we would expect to see as a result of human-caused greenhouse gas emissions. Washington and the Pacific Northwest have experienced long-term warming, a lengthening of the frost-free season, and more frequent nighttime heat waves. Sea level is rising along most of Washington's coast, coastal ocean acidity has increased, glacial area and spring snowpack have declined, and peak stream flows in many rivers have shifted earlier.

6. Projected regional warming and sea level rise are expected to bring new conditions to Washington State. By midcentury, Washington is likely to regularly experience average annual temperatures that exceed the warmest conditions observed in the twentieth century. Washington is also expected to experience more heat waves and more severe heavy rainfall events. These and other local changes are expected to result in a wide range of impacts for Washington's communities, economy, and natural systems. These projected changes threaten our water resources, forests, species and ecosystems, oceans and coasts, infrastructure, agriculture, and human health.

7. Current and future choices about greenhouse gas emissions are important because they will have a significant effect on the amount of warming that occurs after about the 2050s. For example, global warming projected for the end of the century ranges from +1.8°F (range: +0.5°F to +3.1°F), if greenhouse gases are aggressively reduced, to +6.7°F (range: +4.7°F to +8.6°F) under a high "business as usual" emissions scenario. In a Washington-specific economic study, potential costs to Washington of not taking action from climate change impacts are projected to reach nearly $10 billion per year by 2020 and $16 billion per year by 2040.

8. The power sector is one of the largest emitters of greenhouse gases in Washington along with transportation emissions and fossil fuel use in the residential, commercial, and industrial sectors. In addition to combating climate change, reductions in greenhouse gas emissions from power plants will also have cobenefits. We would expect to see decreases from natural gas and coal sources in NOx, fine particulates, and SO_2, pollutants that can directly harm public health and the environment. Washington enacted requirements for the state's largest single source of greenhouse gas emissions, the Centralia coal plant, to shut down operations by 2025 with a schedule of

emissions reductions to be met along the way. The shutdown will also result in decreases in NOx, fine particles, mercury and SO_2.

9. Limits on the Boardman power plant in Oregon will not only address that plant's emissions of greenhouse gases but its emissions of nitrates and its visibility impairment of the eastern portion of the Columbia River Gorge National Scenic Area, spanning southern Washington and northern Oregon. As renewable energy sources continue to be utilized and energy efficiency increases under the Clean Power Plan (CPP), fossil fuel sources will be used less thus decreasing greenhouse gases and other pollutants associated with these sources.

10. Many Washington communities, government agencies, and organizations are preparing for the impacts of climate change. Ecology released a state adaptation plan on April 3, 2012, entitled Washington State Integrated Climate Change Response Strategy. Ecology and a number of other state agencies developed the strategy as a framework for decision-makers to help protect Washington's communities, natural resources, and economy from the impacts of climate change. The framework includes ways to protect people and the environment by reducing risk of damage to buildings, transportation systems, and other infrastructure; reducing forest and agriculture vulnerability;

improving water management; safeguarding fish, wildlife, habitat, and ecosystems; reducing risks to the ocean and coastlines; supporting the efforts of local communities; and strengthening capacity to respond and engage the public.

11. Washington has taken numerous steps to mitigate climate change impacts in the last decade. These include enacting statewide greenhouse gas emission reduction limits that require reductions in greenhouse gas emissions over time including reaching 1990 levels by 2020; 25 percent below 1990 levels by 2035; and 50 percent below 1990 levels by 2050, or 70 percent below expected emissions that year.

12. For power plants, Washington has enacted carbon dioxide mitigation requirements, renewable portfolio standards, and greenhouse gas emission performance standards. It enacted legislation for the shutdown of the Centralia coal plant, the state's largest single source of greenhouse gas emissions. It has established requirements for utilities to perform integrated resource planning on a two-year frequency for meeting forecasted annual peak and power demand, with the lowest reasonable cost and risk. Utilities must pursue all available conservation that is cost-effective, reliable, and feasible.

13. Washington has enacted economy-wide greenhouse gas reporting requirements for large emitters including power plants. Ecology has adopted EPA's "Tailoring rule" that establishes greenhouse gas emissions standards for major stationary sources, including power plants that are subject to the federal Prevention of Significant Deterioration Program, to use best available control technology to reduce those emissions. Washington has adopted greenhouse gas emission standards for Washington's existing refineries. Washington has enacted greenhouse gas emission standards for motor vehicles. All of these statutory and regulatory actions have been accomplished while the economy of Washington has continued to grow and energy prices have remained among the lowest in the country. Currently, Ecology is developing a rule setting a declining cap on carbon emissions in Washington to achieve reductions in greenhouse gas emissions from the state's largest emitters of greenhouse gases including power plants. Combined, these policies will go a long way to reducing Washington's statewide greenhouse gas emissions.

14. Washington strongly supports federal greenhouse gas emission standards under the CPP. Federal standards will benefit Washington because they will ensure reductions of greenhouse gas emissions throughout the

country to mitigate harms from climate change and create incentives for development of cleaner sources of power in Washington. To express its support of the CPP rule, Ecology, in partnership with the Washington State Department of Commerce (Commerce) and the Utilities and Transportation Commission (UTC) reviewed and submitted comments on the proposed rule to EPA on December 1, 2014. The State Energy Office at the Department of Commerce (Commerce) is the state executive agency responsible for developing and analyzing state energy policies. The Utilities and Transportation Commission (UTC) is an independent quasi-judicial regulatory body that regulates the rates and services of investor-owned utilities, and ensures reliable and affordable service.

15. Ecology, Commerce, and UTC have reviewed the final rule. EPA's model plans have been helpful to understand the rule's provisions. The three agencies' comments on the proposed CPP suggested that the rule could be improved if EPA used a multi-year average between three to five years to establish the baseline for setting the interim and final state goals because Washington is a hydro-dominant state and 2012 was an uncharacteristically high water year to use as a baseline where little fossil fuel generation occurred. EPA addressed that comment with a three-year average using the

year before and after 2012, for a more representative baseline. The agencies also suggested that EPA allow the states to submit amendments to their plans at any time subject to EPA's approval. EPA responded by defining a process for states to submit amendments. Finally, we suggested that we have flexible interim compliance targets and changes to how the rule would address energy efficiency. EPA responded positively to make appropriate changes that still kept a stringent overall rule but made implementation more flexible and improved the final rule. After its review of the final rule, Washington believes it is well positioned to implement the CPP.

16. Ecology has begun its efforts to develop the plan to comply with the CPP. These efforts include a stakeholder meeting/listening session to get early views from stakeholders on what approaches it should consider and what areas the stakeholders consider important for discussion. Additional stakeholder and public meetings will be held and Ecology will use webinars and other internet-based tools to present options and elicit opinions from the stakeholders. A technical meeting was held in early November to begin addressing key technical issues related to the Northwest's power generation system and the effects various CPP policy choices might have on the power system. Ecology is developing a plan to work with low income and vulnerable

communities on impacts and opportunities resulting from the CPP. These and other appropriate actions will enable Washington to make its initial submittal by September 6, 2016, as required by EPA's final rule. Washington will be ready to submit its final plan on or before September 6, 2018.

17. Ecology, together with Commerce and UTC, has the ability to direct adequate technical resources and staff to analyze the rule and develop the plan to comply with the CPP. Ecology has determined that rulemaking will be required to implement the CPP. The three agencies are using normal funding sources from state appropriations to fund this work.

18. Ecology should have sufficient ongoing resources to develop and submit the state's CPP plan while also continuing to work on state implementation plan update requirements for new National Ambient Air Quality Standards and including updated regulatory text into those plans. It does not expect the need to divert resources from Ecology's other public policy priorities to implement the CPP.

19. The CPP is not expected to interfere with the state's regulation of the power sector that ensures system reliability and just and fair rates for consumers. Various power planning entities have analyzed impacts of shifting to cleaner energy. The Western Electricity Coordinating Council promotes

regional electric service reliability in western Canada and the western United States and performs system-wide modeling for power demand and system reliability. In 2014 the Western Electricity Coordinating Council modeled the consequences of the shutdown of approximately 7000 MW of coal-fired generation in the west and determined no adverse impact on system reliability.

20. The Northwest Power and Conservation Council performs system load modeling for periodic power plans, including modeling for the seventh plan which is currently being developed. Both the sixth and draft seventh power plans show relatively flat load growth in the Northwest and that cost-effective conservation and energy efficiency programs should ensure that the bulk of the power needs are met. The plans show a continued shift away from coal to natural gas, increased energy efficiency, and renewables to comply with state and federal laws and regulations without creating reliability issues or compromising fair rates. Commerce and UTC, working with Ecology, will help to ensure the final Washington plan does not conflict with rate and reliability priorities.

21. Washington's energy conservation efforts and renewable resource requirements in the energy sector affect greenhouse gas emissions. Washington compels utilities to be proactive and forward-thinking with

requirements of ten-year conservation potentials and biennial conservation targets. Utilities also have annual deadlines for reporting their compliance with Washington's conservation and renewable portfolio standards. The investor-owned utility companies regulated by the UTC have been meeting their renewable portfolio standards obligations to provide an increasing percentage of electricity generated from renewable resources, which will increase to 9 percent in 2016 and to 15 percent in 2020.

22. The UTC regulates the recovery of the costs of these conservation and renewable energy efforts by requiring timely reports, evaluating the prudence of the costs incurred, and ensuring that costs included in rates charged to the public are fair, just, reasonable, and sufficient. The strength of its conservation and renewable energy programs highlights a blueprint for Washington to comply with the CPP. While Washington can already be considered a leader in energy conservation and promotion of renewable resources, it welcomes rules that will directly regulate greenhouse gas emissions in the electricity sector and does not anticipate immediate harm or negative consequences from the CPP's planning requirements.

23. The CPP's compliance measures are consistent with market trends affecting the state's electric power sector, and actions taken to comply

with the plan will not require a major reorganization or disruption of the state's energy economy or regulatory programs. For example, renewable portfolio standards have driven the market to develop almost 9 GW of wind generating capacity in the northwestern United States. Washington has a requirement that utilities are to develop all cost-effective energy efficiency measures. Current power market costs and dispatch favor hydropower, wind, and natural gas combined cycle combustion turbines over coal units, especially those coal units owned by independent power producers. The CPP is expected to support the trend to conservation and renewables and to continue to support development of cleaner power that is cost-effective.

24. To assist with the completion of the state implementation plan for the CPP, the state has available data and analyses from existing programs that will inform the state's process. In addition to the data mentioned above, Ecology administers a greenhouse gas reporting program that requires the power sector to report its emissions. Commerce and the UTC have information about power demand, reliability, and cost. Finally, information comes from investor and consumer-owned utilities in Washington that prepare integrated resource plans.

25. Commerce is coordinating a series of meetings with the investor-owned utilities and others concerning power system modeling to further evaluate the utilities' costs to comply and overall system reliability under the CPP.

26. We do not expect implementation of the CPP to interfere with implementation of Washington's other energy policies and priorities. Instead we expect it to complement those other priorities that have the same objectives that the CPP will advance, including the emissions performance standard, renewable portfolio standard, and energy efficiency resource standard. Other federal systems have not negatively affected the delivery of electricity. For example, the creation of Bonneville Power Administration (federal power agency) and the federal hydroelectricity system have provided the region with low power costs that have benefitted utilities and retail electric customers.

27. Ecology has prepared and submitted state planning documents to EPA before under CAA, including state implementation plans. Washington State has been involved in developing and implementing plans to meet the CAA, Section 110 requirements and nonattainment and maintenance plans since the first plans were required in the 1970s. Ecology has developed at least two plans under CAA, Section 111(d). Ecology has adopted and implemented

Section 111 regulations applicable to new sources and those issued under Section 129 for waste incinerators. Throughout those processes, Ecology worked closely with EPA to ensure each plan met all requirements and expectations. Ecology will continue its close cooperation with EPA to implement the CPP, incorporating any feedback and refining submission(s) as necessary.

28. Washington has developed previous CAA implementation plans in significantly less time than the three-plus years the CPP allots for states to develop compliance plans. Based on this experience and Ecology's review of the CPP, Ecology anticipates developing a final plan within the timelines established in the CPP.

29. Ecology does not anticipate that it will need to seek new legislation to comply with the CPP. However, should it need to do so, Ecology has previous experience seeking state legislation necessary to implement federal environmental laws and clean energy policies. In 2012, Ecology successfully obtained legislative authority in the Washington Clean Air Act, Wash. Rev. Code 70.94, to allow it to regulate emissions from woodstoves and wood heating devices in areas threatened to violate or in violation of the federal particulate matter National Ambient Air Quality Standard. The

legislation needed was obtained in one legislative session in less than one year. Ecology has experience adopting rules to implement federal programs including new emission standards for hazardous air pollutants for industrial facilities under Section 112 of the CAA, and new National Ambient Air Quality Standards under Section 110 of the Act. Ecology can rely on this and other rulemaking experience to timely adopt rules necessary to implement the CPP.

30. Ecology routinely coordinates with Commerce and the UTC on issues of shared interest. For example, when the Washington Legislature enacted emission performance standards for electricity generating units, Commerce worked closely with Ecology, and involved UTC as Ecology adopted a rule to implement the standards. Similarly, Commerce worked with Ecology on Ecology's rule that implemented statutory CO_2 mitigation requirements for power plants. Ecology has also worked with Commerce since 2008 to biennially determine the total emissions of greenhouse gases for Washington and to develop an emissions reporting system to allow a comprehensive inventory of emissions of greenhouse gases from all significant sectors of the Washington economy.

31. EPA has made available a draft model federal plan that would satisfy the CPP requirements for state plans. Washington may want to use the model rules as the state plan, as the basis of a state plan, or, under a "state measures" plan, as a backstop plan.

32. The state has repeatedly sought to expedite EPA action to place federal limits on greenhouse gas emissions. Washington was one of a group of states who through litigation succeeded in requiring EPA to adopt greenhouse gas emission standards for motor vehicles, as well as the power plant rules at issue in this case. Washington was one of a group of states that supported EPA in the litigation challenging EPA's "Tailoring rule".

33. Staying the CPP could delay long-overdue reductions in emissions from the nation's power sector, whose emission reductions would help prevent the worst impacts of climate change in Washington. Delays in emission reductions from these sources will cause the emissions to stay in the atmosphere for many years to come and aggravate the climate change harms to Washington. It will also delay the public health and environmental cobenefits of reductions in criteria and hazardous air pollutants.

34. The CPP acknowledges and provides mechanisms to credit the state's past, present, and future investments in renewable energy and energy

efficiency. It will allow Washington to utilize the benefits from emission reductions generated by investments in renewable energy and energy efficiency that occur after 2013.

35. Washington appreciates that the CPP provides incentives for early action, in the form of bonus emission reduction credits or carbon allowances. These can be obtained by implementing renewable energy deployment and low-income energy efficiency programs that provide emission reductions in 2020 and 2021 that are completed by January 2022. The state is considering including these incentives in its compliance plan.

36. A stay of the final rule would create harmful uncertainty about the timeframe for new renewable or energy efficiency projects to qualify for the program's incentives. If the stay were not lifted until after the state plans are due (under the current rule), this could compress project development times and significantly delay projects or limit their ability to qualify for compliance.

I declare under penalty of perjury that the foregoing is true and correct.

DATED this 3rd day of December 2015, in Lacey, Washington.

STUART CLARK

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF KATHERINE S. DYKES, DEPUTY COMMISSIONER OF THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION

I, Katherine S. Dykes, hereby declare:

1. I am over the age of 18 and understand and believe in the obligations of an oath.
2. I am the Deputy Commissioner for Energy of the Connecticut Department of Energy and Environmental Protection ("DEEP). I joined DEEP in March 2012, after previously serving as Deputy General Counsel for the White House Council on Environmental Quality and as Legal Advisor to the General Counsel for the U.S. Department of Energy.

3. I hold a bachelor's degree in history and environmental studies from Yale, a master's degree in history, also from Yale, and a J.D. from the Yale Law School.

4. Connecticut is a founding member of the Regional Greenhouse Gas Initiative ("RGGI"). RGGI is the first market-based regulatory program in the United States to reduce greenhouse gas emissions. It is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce CO2 emissions from the power sector.

5. I currently serve as the Chair of the RGGI, Inc. Board of Directors. RGGI, Inc. is the non-profit corporation created to support the development and implementation of RGGI.

6. Through RGGI, Connecticut auctions nearly all of its emission allowances. The proceeds from the annual auction cover the administrative costs of implementing the program and furthering Connecticut's climate change programs under Conn. Gen. Stat. § 22a-200c. The administrative costs to administer the program consume only 7.5% of the proceeds. The remaining 92.5% of the proceeds are invested in energy efficiency and renewable energy, through programs administered by the Connecticut Green Bank and Connecticut utility companies. Investments in these programs are spurring

innovation and attracting private investment in the clean energy economy, and creating green jobs in Connecticut and the other RGGI states.

7. Through Connecticut's participation in RGGI and other climate change mitigation programs, our state has demonstrated that significant reductions in carbon pollution—such as the Clean Power Plan now requires—can be achieved affordably and reliably. Between 2005 and 2012, Connecticut reduced gross CO2 emissions from the power sector by 23%, and per capita emissions by 25%. Concurrently between 2005 and 2011, Connecticut's economy-wide emissions of harmful criteria pollutants dropped precipitously; overall emissions of nitrogen oxides (NOx) and sulfur oxides (SOx) decreased by 80% and 91% respectively.
8. Collectively, the RGGI states have reduced carbon pollution by over 40 percent since 2005. During this time, the RGGI states' use of non-hydro renewables has increased by 63%. In 2013, the RGGI states produced about half of their power from clean or renewable sources.
9. Connecticut and the other RGGI states are well-positioned for compliance. As a group, the RGGI states are on track to reduce our power sector carbon pollution to 50 percent below 2005 levels by 2020, well beyond the national Clean Power Plan projection of a 32 percent reduction by 2030.

10. A 2015 peer-reviewed study concluded that RGGI is playing a significant role in the region's reduction in carbon pollution.[1] Complementary state policies and programs are also helping to drive these cost-effective achievements. These policies include utility-administered energy efficiency programs and renewable portfolio standards, which are established policies in many states across the country. Market forces are driving further reductions, by encouraging fuel-switching to less carbon-intensive generation such as high-efficiency, low-emitting natural gas combined cycle generating technology. The RGGI program works in tandem with these policies and market trends to reduce pollution and establish long-term solutions for a reliable energy system.

11. Thanks to investments in energy efficiency, Connecticut families and businesses are using less electricity, which is helping to lower energy bills for customers who install efficiency measures, and for all ratepayers who benefit from lower wholesale electricity prices and avoided energy, generation capacity, and transmission costs. Between 2005 and 2012, electricity consumption in Connecticut decreased by 11% on a per capita

[1] "Why have greenhouse emissions in RGGI states declined? An econometric attribution to economic, energy market, and policy factors." Brian Murray and Peter T. Maniloff, 2015. *Available at* https://sites.nicholasinstitute.duke.edu/environmentaleconomics/files/2014/05/RGGI_final.pdf (last accessed November 25, 2015).

basis and 13% on a gross basis. As a result, Connecticut has ranked among the top ten states on the American Council for an Energy-Efficient Economy Energy Efficiency Score Card for eight consecutive years.

12. By reinvesting RGGI proceeds and other funds in clean energy, Connecticut achieved a tenfold increase between 2010 and 2013 in the amount of renewable energy generation deployed in our state, including solar photovoltaics and fuel cells. Connecticut's renewable portfolio standard mandates that 19.5% of the state's electricity supply be sourced from renewable generation facilities in 2015, a proportion that will increase to 27% by 2020. Through a combination of in-state programs—including investments made by the Connecticut Green Bank[2] with RGGI proceeds—and long-term contracting for grid-scale regional renewables, Connecticut is staying on track to meet its renewable portfolio standard commitments.

Independent Studies on the Economic Benefits of RGGI

13. In 2015, the Analysis Group performed an independent evaluation of the economic impact of the RGGI program for the years 2012-2014.[3] The Analysis Group report concludes that RGGI created $1.3 billion in net

[2]Connecticut's Green Bank was established in 2011 to leverage public and private funds to accelerate the growth of green energy in Connecticut.

[3]Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States, (2015) *available at* http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_july_2015.pdf

overall economic benefits for the region, with each participating state experiencing positive net benefits. During this period, disbursement to states of nearly $983 million in proceeds reduced consumer energy bills by $460 million, resulted in an increase of 14,200 job-years, and saved $1.27 billion in payments to out-of-region fossil fuel providers.

14. The Analysis Group's 2015 study followed its 2011 study, which found that during the RGGI program's first three years in operation (2009-2011), RGGI generated $1.6 billion in net economic benefit for the region, 16,000 job-years, and $1.3 billion in consumer energy bill savings for the participating states.[4]

15. In addition to the Analysis Group, Synapse Energy Economics, Inc. conducted a high level analysis to determine the benefits of using the RGGI proceeds to fund energy efficiency programs in the participating states.[5] With the benefit of one year of auctions, RGGI auctions generated almost $600 million in proceeds with almost half that amount devoted to energy efficiency. Synapse's original analysis, completed in 2010, found that in states with a focus on electricity energy efficiency programs, the benefits

[4] *Id.*

[5] Synapse Energy Economics, Inc., Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis, (2010) *available at* http://www.synapse-energy.com/sites/default/files/SynapseReport.2010-10.RAP_.EE-Benefits-of-RGGI-Proceeds.10-027.pdf

range from $2.17 to $3.76 for every dollar of program cost. This analysis was updated in 2012, and includes an evaluation of other fuel programs funded through RGGI.[6] In the updated study Synapse found that, for every dollar of RGGI auction revenues that was invested in energy efficiency in 2010, participating states received $1.30 to $6.80 in total energy benefits, with a weighted average of $2.30.

16. In July 2015, The Clean Air Task Force analyzed the changes in health impacts caused by the power plants in the RGGI states over the 2005 to 2012 time period using the emissions reported to the EPA's Continuous Emissions Modeling System (CEMS) database.[7] The baseline year was 2012 for which a detailed, plant-by-plant analysis of health impacts was available. Impacts for the earlier years were calculated from the 2012 baseline by comparing emissions in those years to 2012 emissions. Emissions of SO2, NOx and PM2.5 were factored into the analysis. The reductions in emissions and health impacts from 2005 to 2012 were very

[6]Synapse Energy Economics, Inc., Energy Benefits Resulting from the Investment of 2010 RGGI Auction Revenues in Energy Efficiency, (2012) *available at* http://www.synapse-energy.com/sites/default/files/SynapseReport.2012-02.RAP_.RGGI-Energy-Efficiency-Benefits.10-027A.pdf

[7]Clean Air Task Force, RegulationWorks: How science, advocacy and good regulations combined to reduce power plant pollution and public health impacts; with a focus on states in the Regional Greenhouse Gas Initiative (2015) *available at* http://www.catf.us/resources/publications/files/RGGI-Report.pdf

significant. Reductions in overall health-impact-related emissions over that time period were 88.5%. Specifically:

a. Mortality decreased from 1,500 to 180 deaths per year.

b. Asthma incidents decreased from 26,000 to 3,000 per year.

c. Hospital admissions decreased from 1,200 to 145 per year.

d. Health impact cost decreased from $12.3 billion to $1.4 billion per year.

17. The Clean Air Task Force found that in addition to the reduction in health impacts there were similar reductions in emissions. Reductions in overall health-impact-related emissions over that time period were 88.5%. Similarly, the dollar cost to society of the health impacts went down by the same 88.5%. The reduction in CO2 emissions, while not factored into the health impact calculations, was 42.3%.

18. Specific to Connecticut, the Clean Air Task Force found the following results:

	Mortality (Laden[8])	**Mortality (Pope[9])**	**Bronchitis Acute & Chronic**	**Heart Attacks**	**Asthma Incidents**	**Hospital Admissions**
2005	43	17	34	31	280	14
2006	38	15	30	27	250	12
2007	35	13	27	25	226	11

[8]Mortality studies by Francine Laden et al.
[9]Mortality studies by C. Arden Pope III et al.

2008	35	14	28	25	232	11
2009	19	7	15	14	125	6
2010	21	8	16	15	137	7
2011	6	2	4	4	37	2
2012	2	1	2	2	14	1

19. The RGGI states have achieved extensive economic and health benefits in a short period of time. RGGI serves as a concrete example that a stay of the CPP is unnecessary as avenues exist for all states to achieve compliance with the CPP without unacceptable drops in revenue, power generation and jobs. Furthermore, the demonstrated health benefits of RGGI provide further incentives for states to act.

RGGI Has Achieved Cost-Effective Carbon Reductions While Maintaining Reliability

20. As a RGGI state, Connecticut has demonstrated that significant pollution reduction can be achieved in the power sector while maintaining grid reliability. Investments in peak demand reduction and energy efficiency programs—funded in part by RGGI proceeds—have enabled Connecticut to contribute to a more resilient, reliable electricity system.

21. Climate change and aging infrastructure also pose threats to reliability, which RGGI helps to mitigate by reducing climate pollution. The recent U.S. Department of Energy *Quadrennial Energy Review* found that severe

weather is the leading cause of power disruptions, costing the U.S. economy from $18 billion to $33 billion per year.

22. Connecticut has already experienced these adverse climate impacts, resulting in direct costs to our citizens and businesses. In 2011 and 2012, a series of intense storms left record numbers of residents without electricity, communications, heat, or reliable supplies of water. More than 800,000 customers lost power during Tropical Storm Irene in August 2012; six weeks later, an unusual Halloween nor'easter caused a record-setting 880,000 customer outages; and in 2012, more than 625,000 customers lost power during Superstorm Sandy. The cost of restoring power and rebuilding electric distribution lines damaged in those storms has reached to the hundreds of million dollars, and will be recovered from Connecticut ratepayers. According to the state's Department of Insurance, properties along the Connecticut coastline are collectively valued at over $570 billion. Insurance companies paid out nearly $1 billion for 200,000 covered claims as a result of the 2011-2012 storms.

Federal Action is Necessary and Proper

23. Connecticut has long been an advocate for federal action to limit greenhouse gas emissions. RGGI was created with the goal that it would serve as a model that could eventually be expanded into a federal program. As the

EPA noted in the CPP, RGGI is a model other states can duplicate without difficulty or states can enter into the federal trading program.

24. Connecticut has long demonstrated its support for the CPP. Connecticut joined other RGGI participating states in a letter dated December 2, 2013, urging the EPA to take action under 111(d).

25. On November 28, 2014, Connecticut submitted comments on the draft of the CPP supporting EPA's general approach. Connecticut also joined RGGI participating states' joint comments and supplemental comments supporting the Draft CPP, submitted on November 5, 2014 and December 1, 2014, respectively. Additionally, Connecticut joined thirteen other states (California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, and Washington) in joint comments on December 1, 2014, supporting the general approach taken by EPA in the draft Clean Power Plan.

RGGI States are Well-Positioned to Comply with the CPP

26. The CPP compliance process for Connecticut will be very similar to the process Connecticut and the other RGGI participating states undertook in the formation of RGGI in 2008 and the RGGI program review in 2012. In fact, the CPP submission deadlines align comfortably with RGGI's 2016 Program

Review, which was planned well in advance of the deadlines established by the final CPP. Connecticut expects some adjustments will have to be made to conform RGGI to the final CPP, but does not expect significant difficulties in implementing these changes and achieving timely submission of the state's implementation plan on the timeline required under the final CPP.

27. The RGGI states have already begun the CPP compliance process. The RGGI participating states are addressing regional pathways for CPP compliance with the final CPP as part of the regular RGGI Program Review already planned for 2016. The RGGI Program Review provides an opportunity for regular engagement with stakeholders and compliance entities to strengthen RGGI program design and implementation.

28. The 2016 RGGI budget allocated sufficient funds, collected by the participating states' dues to RGGI, Inc., to complete the Program Review process. Connecticut will also conduct a Connecticut-specific process to engage with stakeholders on CPP compliance, utilizing existing resources. Furthermore, proceeds from the RGGI auction are supporting DEEP staff work on Connecticut's CPP compliance.

29. The first RGGI stakeholder meeting was held on November 17, 2015 in New York City. Further stakeholder comments are welcome through December

4, 2015. In addition, there will be quarterly meetings throughout 2016, both in person and via webinar. Stakeholders are encouraged to attend these meetings to maximize their input regarding the advantages of different state plans.

30. RGGI, Inc. will be undertaking modeling as part of the 2016 Program Review. Due to RGGI funds available through the shared resources of participating states, there is sufficient funding to engage in modeling. The modeling will permit RGGI states to customize the RGGI program design and CPP compliance approach to meet the needs and policy objectives of all of the participating states. The RGGI experience shows that investment in energy efficiency and renewable energy is consistent with economic growth and in fact creates more growth than business as usual.

I declare under penalty of perjury that the foregoing is true and correct

Executed this 30th of November, 2015.



Katherine S. Dykes
Deputy Commissioner for Energy of the Connecticut Department of Energy and Environmental Protection

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF ROBERT KLEE,
COMMISSIONER OF THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION

I, Robert Klee, hereby declare:

1. I am over the age of 18 and understand and believe in the obligations of an oath.

2. I am the Commissioner of the Connecticut Department of Energy and Environmental Protection (DEEP). I was appointed Commissioner of DEEP by Connecticut Governor Dannel P. Malloy in January of 2014.

3. I have served DEEP since April of 2011. I hold a Ph.D. from the Yale School of Forestry & Environmental Studies in industrial ecology, a law degree from the Yale Law School, and an undergraduate degree from Princeton University in geology and environmental science.

4. As the Commissioner of DEEP, my job includes guiding DEEP's integration of energy and environmental policies and helping Connecticut to build a sustainable and prosperous 21st-century economy.

5. In 2011, in recognition of the essential interconnectivity of effective energy and environmental policies, Governor Malloy, in conjunction with the Connecticut General Assembly, merged the Department of Environmental Protection, the Department of Public Utility Control, and the energy policy section of The Office of Policy and Management and created the single agency of DEEP. This action resulted in a more successful alignment of Connecticut's energy and environmental policies. As a consolidated agency, DEEP is well-positioned to review, analyze and respond successfully to the recent Clean Power Plan final rules. The Connecticut team that will respond to the Clean Power Plan final rules includes members from both the Bureau of Energy and Technology Policy and the Bureau of Air Management. I am in direct and frequent contact with this team as is my Deputy Commissioner of Energy and current Chair of the Board of Directors of RGGI, Inc., Katherine S. Dykes.[1]

[1] *See* Declaration of Katherine S. Dykes.

Connecticut's Vulnerability to the Effects of Greenhouse Gases

6. It is imperative that states reduce greenhouse gas emissions in order to avert the severe economic, environmental and human harm from climate change. Connecticut is already experiencing the impacts of climate change. These impacts are directly harming the health and welfare of Connecticut residents and causing significant economic damage. Heavy rainfall events, flooding, and hurricane activity have increased in frequency and intensity in recent years and are expected to continue to increase. In August 2011, Tropical Storm Irene left 800,000 Connecticut customers without power for up to nine days. This record outage was surpassed just six weeks later when an October snowstorm disrupted power for 880,000 Connecticut customers. And in October 2012, Superstorm Sandy struck many of the areas still recovering from Tropical Irene and disrupted power for the greater portion of a week to more than 625,000 customers. Superstorm Sandy was deemed a superstorm because of the confluence of several severe weather systems, but also due to a warming climate. Rising sea levels increase the prospect that states like Connecticut will be increasingly vulnerable to these types of storms in the years ahead. The estimated cost to Connecticut for the 2011 storms will exceed $750 million dollars. That figure does not include

uninsured losses that could push the total losses over $1 billion dollars. The impact from these storms is not limited to Connecticut and affected numerous states.

7. The health of Connecticut's citizens is negatively impacted when greenhouse gases are not sufficiently controlled. Increased greenhouse gasses cause higher temperatures, which in turn cause an increase in ozone levels. High ozone levels aggravate existing conditions like asthma, cause breathing difficulties and can result in death.

8. In April 2010, the Governor's Steering Committee on Climate Change produced a report that predicted the impact of climate change on Connecticut's agriculture, infrastructure, natural resources and public health. In general the report concluded that the impact of climate change on these four areas would be largely negative; Connecticut crops such as maple syrup, apple and pear production, and shellfish will suffer; infrastructure to control coastal flooding and stormwater could be substantially damaged; rare habitats and critical species face elimination; and Connecticut's public health, particularly of the most vulnerable communities, is threatened by a decrease in air quality, extreme heat and the favorable conditions for increased disease.

Connecticut's Experience Addressing Greenhouse Gas Emissions

9. Connecticut is a founding member of the Regional Greenhouse Gas Initiative (RGGI). RGGI is the first market-based regulatory program in the United States to reduce greenhouse gas emissions. It is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce carbon dioxide (CO_2) emissions from the power sector.

10. Through RGGI, Connecticut auctions nearly all of its emission allowances. The proceeds from the annual auction cover the administrative costs of implementing the program and furthering Connecticut's climate change programs under Conn. Gen. Stat. § 22a-200c. 92.5% of Connecticut's RGGI proceeds are invested in energy efficiency and renewable energy. *See* Declaration of Katherine S. Dykes for further information regarding the positive impacts of RGGI.

11. In addition to its participation in RGGI, Connecticut's commitment to climate change action is reflected in its leadership in developing climate change legislation. Connecticut has passed many laws that will help Connecticut attain our greenhouse gas mitigation goals. For example, in 2008, Connecticut adopted An Act Concerning Global Warming Solutions

that sets forth economy-wide greenhouse gas emission reduction requirements of 10% below 1990 levels by January of 2020 and 80% below 2001 levels by 2050. These statutory mandates have ensured that Connecticut is on a trajectory to achieve the power sector reductions required by the Clean Power Plan. Connecticut expects to continue to lead by example and achieve reductions of carbon dioxide beyond the levels established by the federal program.

12. Furthermore, DEEP is statutorily required to prepare a Comprehensive Energy Strategy for Connecticut every three years, and an Integrated Resources Plan for the electric sector every two years. Both the Comprehensive Energy Strategy and the Integrated Resources Plan provide a strategic planning framework. This framework includes an integrated approach to environmental and energy planning that enables Connecticut to identify cost-effective strategies to achieve emission reductions in the electric sector while maintaining a reliable electric grid and achieving affordable energy for consumers. As such, Connecticut is well positioned to coordinate activities across the State's agencies to comply with the final Clean Power Plan. The attached appendix to this declaration contains a list of these and other Connecticut laws intended to help prepare for and respond to climate change concerns. *See* attached Appendix.

Connecticut's Success in Addressing Climate Change

13. Connecticut is addressing the unavoidable impacts of climate change through adaptation strategies that focus on land use, shoreline preservation, flood and storm surge projections, resilient engineering, policy and financing tools – as well as protection of natural resources, habitats and species. The Connecticut Global Warming Solutions Act of 2008 requires the Department of Energy and Environmental Protection to issue a Progress Report on the State's progress toward reducing greenhouse gases and building resilience to the harmful impacts the global community is too late to avoid. The most recent report, Taking Action on Climate Change, was issued in 2014. *See* DEEP, Taking Action on Climate Change 2014 Progress Report (2014), *available at* http://www.ct.gov/deep/lib/deep/climatechange/ct_progress_report_2014.pdf

14. In 2013, the Connecticut General Assembly enacted two important adaptation bills, Public Act 13-179, and Special Act 13-9. Public Act 13-179 contains updated sea level rise considerations and planning procedures, including projected impact on coastal development and permitting. Special Act 13-9 calls for a plan to establish a Connecticut Center for Coasts as well

as for significant data collection, monitoring requirements, and reporting guidelines.

15. Global climate change is expected to significantly increase the risks of disruption to the regional power grid, so DEEP has awarded $23 million in funding through its microgrid grant program to help communities establish distributed generation networks to keep critical infrastructure operational during a power outage. DEEP followed this initial investment with a recently announced third round of $30 million in additional funding. DEEP will begin accepting applications for this third round of funding beginning December 10, 2015, and will review applications on a rolling basis.

16. Furthermore, Connecticut has partnered with the University of Connecticut to create the Connecticut Institute for Resilience and Climate Adaptation (CIRCA). CIRCA is a multi-disciplinary, regional center of excellence, which brings together experts in the natural sciences, engineering, economics, political science, finance, and law to provide practical solutions to the impacts of a changing climate. CIRCA has made grants of more than $60,000 available to municipal governments and councils of government for initiatives that advance resilience, including the creation of conceptual design, construction (demonstration projects or other) of structures, or the design of practices and policies that increase a structure's resilience to

climate change and severe weather. CIRCA has also granted almost $100,000 in matching funds to Connecticut institutions, universities, foundations, and other non-governmental organizations for projects that address practical solutions to climate change.

17. On April 22, 2015, Governor Malloy issued Executive Order 46 creating the Governor's Council on Climate Change, also known as the GC3. GC3 replaced the former Governor's Steering Committee on Climate Change and is charged with examining the efficacy of existing policies and regulations designed to reduce greenhouse gas emissions and identifying additional measures and strategies to meet the state's greenhouse gas emissions reduction target of 80% below 2001 levels by 2050. GC3 is tasked with developing interim statewide greenhouse gas reduction targets for the years 2020-50 and will identify short- and long-term statewide strategies to achieve the necessary reductions. GC3 is composed of representatives from state agencies, quasi-state agencies, businesses, and nonprofits.

18. In the wake of Superstorm Sandy, the state applied for and received recovery money from the United States Department of Housing & Urban Development that helped repair some of the damage to properties along Connecticut's shoreline. Despite those funds, significant damage remains and far more funding is needed to both increase the resiliency of

communities already devastated as well as diminish the risk of future storms. In response to the United States Department of Housing & Urban Development Billion Dollar Natural Disaster Relief Competition, the State worked with CIRCA to develop and submit a Phase 1 application in October, 2015. When the State was subsequently invited to submit a Phase 2 application, the State formed a council called State Agencies Fostering Resilience. State Agencies Fostering Resilience collaborated with consultants to develop a Phase 2 application, which is focused on the advancement of resilient, transit oriented development based on the scientific research of CIRCA and the unmet needs of underserved constituencies and critical infrastructure in New Haven and Bridgeport, cities that were heavily impacted by Superstorm Sandy.

19. Through Connecticut's participation in RGGI and other climate change mitigation programs, our state has demonstrated that significant reductions in carbon pollution—such as the Clean Power Plan now requires—can be achieved affordably and reliably. Between 2005 and 2012, Connecticut reduced gross CO_2 emissions from the power sector by 23%, and per capita emissions by 25%. Concurrently, between 2005 and 2011, Connecticut's economy-wide emissions of harmful criteria pollutants dropped

precipitously; overall emissions of nitrogen oxides (NO_x) and sulfur oxides (SO_x) decreased by 80% and 91% respectively.

20. Collectively, the RGGI states have reduced carbon pollution by over 40 percent since 2005. During this time, the RGGI states' use of non-hydro renewables has increased by 63%. In 2013, the RGGI states produced about half of their power from clean or renewable sources.

21. Thanks to investments in energy efficiency, Connecticut families and businesses are using less electricity, which is helping to lower energy bills for customers who install efficiency measures, and for all ratepayers who benefit from lower wholesale electricity prices and avoided energy, generation capacity, and transmission costs. Between 2005 and 2012, electricity consumption in Connecticut decreased by 11% on a per capita basis and 13% on a gross basis. As a result, Connecticut has ranked among the top ten states on the American Council for an Energy-Efficient Economy Energy Efficiency Score Card for eight consecutive years.

22. Connecticut's proactive energy and environmental policies are keeping Connecticut on track to further reduce greenhouse gas emissions by pursuing a cheaper, cleaner, and more reliable energy future. In 2011, Connecticut established the nation's first Green Bank, to leverage public and private funds to accelerate the growth of green energy in Connecticut. Over the past

two years, each $1 of public funds invested via the Green Bank, attracted approximately $5-$10 of investment from private sources.

23. By reinvesting RGGI proceeds and other funds in clean energy, Connecticut achieved a tenfold increase between 2010 and 2013 in the amount of renewable energy generation deployed in our state, including solar photovoltaics and fuel cells. Connecticut's renewable portfolio standard mandates that 19.5% of the state's electricity supply be sourced from renewable generation facilities in 2015, a proportion that will increase to 27% by 2020. Through a combination of in-state programs—including investments made by the Connecticut Green Bank with RGGI proceeds—and long-term contracting for grid-scale regional renewables, Connecticut is staying on track to meet its renewable portfolio standard commitments.

24. Connecticut has been a national leader on climate change action since 2001, when the State helped to develop the first ever international, multi-jurisdictional climate change action plan. This plan, the 2001 New England Governors/Eastern Canadian Premiers (NEG/ECP) Climate Change Action Plan, included an agreement on regional greenhouse gas reduction goals designed to achieve climate stability by mid-century. This agreement provided the basis for the targets established by the Connecticut General Assembly with the passage of the Global Warming Solutions Act. On

August 31, 2015, the New England Governors and Eastern Canadian Premiers adopted a resolution on climate change (Resolution 39-1) to continue NEGC/ECP's international leadership on climate change by establishing a 2030 reduction marker for the region to achieve at least a 35%-45% decrease in emissions from 1990 levels.

25. Connecticut's continuing efforts are laying a foundation to achieve the dramatic reductions in carbon emissions necessary by mid-century to fight climate change while creating jobs and generating savings and revenue that flow back into our local economy.

Federal Action is Necessary and Proper

26. Connecticut has long been an advocate for federal action to limit greenhouse gas emissions. RGGI was created with the goal that it would serve as a model that could eventually be expanded into a federal program. RGGI is a model other states can duplicate without difficulty.

27. On April 18, 2008, Connecticut joined seventeen other states signing the Governors' Declaration on Climate Change. In the declaration, the eighteen governors recognized the threat to their states' resources from climate change, encouraged the federal government to establish a strong and effective federal climate policy and recommitted themselves to stop global warming through a "federal-state partnership." The declaration specifically

recognized that a federal cap and trade system could drive meaningful climate action. Several of the governors from states now opposing the Clean Power Plan signed on to this declaration, including Kansas, Arizona, Colorado, Florida and Michigan.

28. Connecticut has long demonstrated its support for the Clean Power Plan. Connecticut joined other RGGI participating states in a letter dated December 2, 2013, urging the EPA to take action under Section 111(d) of the Clean Air Act.

29. On November 28, 2014, Connecticut submitted comments on the draft of the Clean Power Plan supporting EPA's general approach. Connecticut also joined RGGI participating states' joint comments and supplemental comments supporting the Draft Clean Power Plan, submitted on November 5, 2014 and December 1, 2014, respectively. Additionally, Connecticut joined thirteen other states (California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, and Washington) in joint comments on December 1, 2014, supporting the general approach taken by EPA in the draft Clean Power Plan.

Connecticut is Well-Positioned to Address Its Obligations Under the Clean Power Plan

30. Many of the issues and suggestions raised in Connecticut's November 28, 2014 comment letter were constructively addressed in the final Clean Power Plan including; equity among state goals, fairer assessment of ability to deploy renewables, increased opportunities to use natural gas conversions as a compliance mechanism, and credit for early action. As a result of Connecticut's efforts to understand and prepare comments on the proposed rule, and its review of the final rule, Connecticut is well prepared to begin planning for compliance with the Clean Power Plan.

31. Connecticut has already begun its compliance planning efforts. The flexibility of the final rule, allowing for mass-based compliance, for which the EPA provided both interim and final targets, provides Connecticut and the other states a clear path toward compliance. Connecticut is conducting a joint stakeholder process with the other RGGI participating states as well as a Connecticut specific process.

32. Connecticut's efforts will be more than sufficient to support an initial submission that meets the requirements of the final rule by September 6, 2016, and a final plan by September 6, 2018, if not before.

33. To comply with the Clean Power Plan, Connecticut will perform analysis, stakeholder engagement, and statutory or regulatory changes – in a manner similar to the process it has used in a myriad of other Clean Air Act rules. The process for compliance with Cross-State Air Pollution Rule (CSAPR) is essentially the same as the requirements of the Clean Power Plan. The Clean Power Plan compliance process for Connecticut is also very similar to the process Connecticut and the other RGGI states undertook in the formation of RGGI in 2008 and the RGGI program review in 2012. In fact, the Clean Power Plan submission deadlines align comfortably with RGGI's 2016 Program Review, planned well in advance of the deadlines established by the final Clean Power Plan. Connecticut expects some adjustments will have to be made to conform RGGI to the final Clean Power Plan, but does not expect significant difficulties in implementing these changes and achieving timely submission of the state's implementation plan on the timeline required under the final Clean Power Plan.

34. As announced at the kick-off of the 2016 Program Review on November 17, 2015, the RGGI participating states, including Connecticut, are folding the compliance with the final Clean Power Plan into the 2016 RGGI Program Review. The 2016 RGGI budget allocated sufficient funds, collected by the participating states' dues to RGGI, Inc., to complete this project.

Furthermore, proceeds from the RGGI auction are supporting DEEP staff work on Connecticut's Clean Power Plan compliance.

35. Connecticut will also conduct a Connecticut-specific process within existing resources.

36. Connecticut's analysis of the impacts of climate change show that absent action, the costs of adapting to climate change will be far greater than the costs of taking action. The RGGI experience shows that investment in energy efficiency and renewable energy can reduce the production of greenhouse gases while simultaneously generating economic growth.[2]

37. The Clean Power Plan will not interfere with a state's sovereignty. Through its participation in RGGI, Connecticut has demonstrated that states can cooperate and still retain sovereignty and control over their own energy and environmental policies. For example, each of the RGGI states invests its share of the auction proceeds in line with its own priorities.

38. Connecticut, along with the United States Congress through the enactment of the Federal Power Act, has long recognized that the electric grid is interconnected and is not limited to states' borders. The trading program currently in place in RGGI and envisioned by the Clean Power Plan,

[2] *See* Declaration of Katherine S. Dykes for further details of the benefits Connecticut has realized through its participation in RGGI.

recognizes the reality of our interconnected grid and allows states to implement their own policy goals.

39. Connecticut is very familiar with the process of preparing and submitting State Implementation Plans ("SIPs"). Some recent examples of Connecticut's SIP submissions include plans to address infrastructure requirements for national ambient air quality standards (NAAQS) as they are revised; regional haze plans; plans addressing reasonably available control measures (RACT) requirements under ozone NAAQS; and the transformation of the state's vapor recovery program. In particular, Connecticut's generation of the Regional Haze 5-Year Progress Report (July 13, 2015) and the RACT Analysis under the 2008 Ozone NAAQS (July 17, 2014) are heavily focused on ensuring reductions of emissions of NO_x, SO_x, and Fine Particulate Matter from electricity generating units ("EGUs"). And the Regional Haze Progress Report also demonstrates the effectiveness of coordinated efforts by northeastern and mid-Atlantic states to implement regional strategies to address haze and visibility as required by the Clean Air Act.

40. The timing of the Clean Power Plan state submissions does not pose a problem for Connecticut. For example, Connecticut's 2014 RACT submission and its Regional Haze 5-year Progress Report were both

developed in a period of about five months. Similar to the structure of the Clean Power Plan, implementation of the commitments made in these SIPs will extend over several years.

41. In response to EPA's promulgation of the Nitrogen Oxide (NO_x) SIP Call and NO_x Budget Rules, Connecticut crafted and implemented a summertime NO_x allowance trading program that mainly affected the power generation sector. Both programs involved close coordination by all the participating states and the EPA to co-manage the program to avoid adverse reliability impacts across multiple Regional Transmission areas. Both programs are quite similar to RGGI, the CSAPR, and the compliance options available under the Clean Power Plan. Connecticut's NO_x SIP call filing was developed and promulgated within a mere 12 months, met EPA timelines and involved close coordination between the agencies now constituting DEEP, the affected states, multiple EPA regions and stakeholders.

42. Recently, Connecticut demonstrated that it has the capacity to develop plans that require multi-year complex planning, coordination with EPA and regulatory, and legislative changes in a relatively short period of time. Following EPA's widespread use determination and waiver of the Stage II vapor recovery as an ozone nonattainment measure in May 2012, DEEP was able to promulgate a regulatory revision and coordinate with others resulting

in a legislative change to the authorization of the Stage II program so that a SIP could be submitted in 2015 demonstrating the satisfaction of Clean Air Act sections 184(b) and 110(*l*). Such extensive and timely regulatory development is typical in Connecticut, and the planning timeframes for the Clean Power Plan are adequate for Connecticut's development of a plan to implement the Clean Power Plan and any necessary regulatory revisions.

43. As demonstrated in the previous examples, DEEP has Air Bureau staff who are well-versed in Clean Air Act planning tasks that involve working closely with EPA, the Connecticut legislature, and other state agencies to submit an approvable plan on time.

44. The Clean Power Plan's compliance measures are in step with the current developments in Connecticut's energy market. In particular, the state has seen increasing dispatch of natural gas plants, new renewable energy projects, and deployment of energy efficiency measures. Connecticut has significant untapped renewable and efficiency resources that are available for development during the Clean Power Plan compliance period, and current market trends in the state confirm that developing those resources will be cost-effective.

45. Connecticut's efforts to address its own greenhouse gases in a responsible and effective manner have positioned it well to address the requirements of

the Clean Power Plan. States who have chosen to ignore the challenges of climate change and have continued to rely on carbon-intensive energy sources should not unfairly avoid carbon reduction measures given the broad ramifications of the problem. Moreover, the experience of RGGI states shows that states who have not yet acted to reduce CO2 emissions from the power sector have an opportunity to make substantial reductions through implementation of the more cost-effective efforts available to them.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 30th of November, 2015.



Robert Klee
Commissioner of the Connecticut Department of
Energy and Environmental Protection

Appendix to Declaration of Robert Klee, Commissioner of the Connecticut Department of Energy and Environmental Protection

I. Connecticut Legislation Reflecting Connecticut's Commitment to Addressing Greenhouse Gases and Climate Change.

Public Act 15-194: "An Act Concerning the Encouragement of Local Economic Development and Access to Residential Renewable Energy"

- Requires the Connecticut Green Bank to offer incentives to support the deployment of no more than 300 MW of residential solar.

Public Act 15-113: "An Act Establishing a Shared Clean Energy Pilot Program"

- Requires DEEP to establish a two-year pilot program for shared clean energy facilities using Class I renewable energy sources.

Public Act 15-107: "An Act Concerning Affordable and Reliable Energy"

- Authorizes DEEP to solicit and select proposals to meet winter reliability needs using Class I renewable energy sources, energy efficiency, Class III energy sources, large-scale hydropower, and natural gas.

Governor's Executive Order 46:

- Establishes a new Governor's Council on Climate Change to monitor the state's greenhouse gas emissions and make recommendations to meet the 2050 GWSA target.

Special Act 13-9: "An Act Concerning Climate Change Adaptation and Data Collection"

- Endorses the establishment of a Coastal Climate and Resiliency Center to provide resources and technical support.

Governor's Executive Order 32:

- Requires Connecticut to purchase renewable energy in increasing amounts, leading to 100% renewable energy by 2050.

Public Act 13-303: "An Act Concerning Connecticut's Clean Energy Goals"

- Allows for large-scale procurement of regional renewable power, commencing immediately with policy tools (long-term contracts, reverse auctions, reduced reliance on older biomass projects, etc.) to ensure that projects get built at the lowest possible cost to ratepayers.
- Tightens standards for biomass to qualify as a Class I Renewable, ensuring the most effective use of limited clean energy incentive dollars.
- Increases competitiveness in the clean energy marketplace by introducing large-scale hydropower, which will result in lower electricity rates to consumers.

Public Act 13-298: "An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy and Various Revisions to the Energy Statutes"

- Doubles funding for residential, commercial, and industrial energy efficiency investments throughout the state.
- Creates a robust "decoupling" mechanism to ensure that utilities are properly incentivized for investments in energy efficiency.
- Ensures availability of energy efficiency financing to lower income households.
- Allows for submetering for all residents and businesses that use a Class I renewable or Combined Heat and Power (CHP) unit for generation, which will result in increased energy efficiency gains and lower energy demand.
- Allows for residents to utilize on-bill financing to pay for heating systems and energy efficiency upgrades.
- Creates a new "Energize" program that drives energy efficiency upgrades through community aggregation and that drives natural gas conversions through community aggregation.
- Expands virtual net metering for government entities to include critical facilities and enables agricultural virtual net metering.
- Requires gas utilities to create an action agenda that will convert roughly 300,000 non-gas customers to a cheaper and cleaner natural gas supply.
- Revises the "hurdle rate" from 15 to 25 years to facilitate the expansion of the natural gas infrastructure by better aligning financing in terms with the life expectancy of gas mains and allowing gas companies to finance more gas main extensions.
- Enables the state to use non-taxpayer dollars to help deploy electric vehicle charging stations through the EVConnecticut initiative.

- Allows for the adjustment of the rate structure for electric vehicle charging stations.
- Adjusts the regulatory framework to allow for municipal ownership of microgrids that cross a public right of way.

Public Act 13-285: "An Act Concerning Recycling and Jobs"

- Helps Connecticut increase the recycling rate and lower per capita disposal costs by recapturing more of the valuable materials in the waste stream.

Public Act 13-239: "An Act Authorizing and Adjusting Bonds of the State for Capital Improvements, Transportation, Elimination of the Accumulated GAAP Deficit and Other Purposes"

- Commits an additional $25 million for energy efficiency upgrades in state buildings, on top of an existing $43 million investment.
- Commits an additional $30 million for the build-out of microgrids across the state.
- Provides $20 million for state acquisition of open space lands under the Recreation and Natural Heritage Trust Program.
- Provides $20 million for grants to municipalities and land trust organizations to support local open space purchase under the Open Space and Watershed Land Acquisition Grant Program.

Public Act 13-179: "An Act Concerning the Permitting of Certain Coastal Structures by the Department of Energy and Environmental Protection"

- Requires development of best practices for permitting of coastal structures and refines coastal regulatory procedures for ease of use by the public.

Public Act 13-78: "An Act Concerning Water Infrastructure and Conservation, Municipal Reporting Requirements and Unpaid Utility Cost Accounts at Multi-Family Dwellings"

- Promotes water conservation - and conservation of the energy used to treat and deliver it - through changes in water company rate structures.

Public Act 13-61: "An Act Concerning Property Tax Exemptions for Renewable Energy Sources"

- Creates a property tax exemption for Class I Renewable power projects.

Public Act 13-15: "An Act Concerning Sea Level Rise and the Funding of Projects by the Clean Water Fund"

- Takes a forward look at sea level rise to guide state investments.

Public Act 12-148: "An Act Enhancing Emergency Preparedness and Response"

- Establishes a pilot program to fund microgrids for critical facilities.
- Expands the depth of the state's civil preparedness and training requirements.

Public Act 11-80: "An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future"

- Creates the Department of Energy and Environmental Protection through the combination of the former Departments of Environmental Protection and Public Utility Control (DEP and DPUC respectively). The former DPUC becomes the Public Utilities Regulatory Authority (PURA).
- Requires DEEP to prepare a Comprehensive Energy Strategy for Connecticut on a tri-annual basis and requires DEEP to prepare an Integrated Resources Plan.
- Creates a Combined Heat and Power (CHP) pilot program.
- Authorizes state agencies and municipalities to enter into energy saving performance contracts with energy service companies.
- Requires that energy consumption in state-owned or state-leased buildings be reduced 10% by 2013, and an additional 10% by 2018.
- Creates the Clean Energy Finance and Investment Authority (CEFIA), the "green bank."
- Initiates a residential solar investment program, operated by CEFIA.

Public Act 08-98: "An Act Concerning Global Warming Solutions" (Global Warming Solutions Act, or GWSA)

- Adopted by the General Assembly in 2008, setting forth the following greenhouse gas emission reduction requirements:

  - By January 2020, reduce greenhouse gas emissions to 10% below 1990 levels; and
  - By January 2050, reduce greenhouse gas emissions to 80% below 2001 levels.
- Pursuant to the GWSA, the Department of Energy and Environmental Protection is required to:
  - Publish on this website a baseline inventory of greenhouse gas emissions to establish a baseline for such emissions in the state and publish a summary of greenhouse gas emission reduction strategies by December 2009;
  - Publish on this website by July 2010 the results of greenhouse gas reduction modeling scenarios, including, but not limited to, the evaluation of potential economic and environmental benefits and opportunities for economic growth based on such scenarios;
  - Analyze greenhouse gas emission reduction strategies and, after an opportunity for public comment, make recommendations by July 2011 on which such strategies will achieve the greenhouse gas emission levels specified in the GWSA; and
  - Beginning in July 2012 and every three years thereafter, develop with an opportunity for public comment, a schedule of recommended regulatory actions by relevant agencies, policies and other actions necessary to show reasonable further progress towards achieving the greenhouse gas emission levels specified in the GWSA.

Public Act 04-252: "An Act Concerning Climate Change"

- Requires mandatory reporting of Greenhouse Gas (GHG) emissions and creates a GHG registry.
- Adopts GHG emissions reduction targets established by the Conference of New England Governors and Eastern Canadian Premiers of achieving 1990 (regional) baseline GHG levels by 2010; 10% below 1990 levels by 2020; and 75-85% below 2001 GHG levels by 2050 (unless otherwise dictated by the Conference).
- Requires a Climate Action Plan be created that outlines steps to achieve the 2010 and 2020 GHG reduction targets.
- Requires the Department of Administrative Services (DAS) to identify and purchase when possible, recycled and/or environmentally preferable products, services, and practices.

Public Act 04-231: "An Act Concerning Clean and Alternative Fuel Vehicles"

- Promotes clean and alternative fuel vehicle adoption through provision of tax incentives.

Public Act 04-222: "An Act Concerning Preservation of the Family Farm and Long Island Sound"

- Promotes the purchase of Connecticut-grown foods by the State.
- Creates a "Connecticut Farm Fresh" program.

Public Act 04-85: "An Act Concerning Energy Efficiency Standards"

- Establishes energy efficiency standards for products and appliances.

Public Act 04-84: "An Act Concerning Clean Cars"

- Adopts California light duty motor vehicle emissions standards.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF DOUGLAS L. McVAY, CHIEF, OFFICE OF AIR RESOURCES, RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

I, Douglas L. McVay, declare:

1. This declaration is based on my personal knowledge. I am over the age of eighteen (18) years and suffer from no legal incapacity. I submit this declaration in support of the objections to the motions to stay filed in the above referenced matter.

2. I am the Chief of the Rhode Island Department of Environmental Management ("RIDEM"), Office of Air Resources. I have worked in Rhode Island's air pollution control program since 1977 in various capacities. I worked in the program as an Air Pollution Engineer from 1977 to 1979; as a Senior Air Pollution Control Engineer from 1979 to 1984; as a Principal Air Quality Engineer

from 1984 to 1992; as an Associate Supervising Sanitary Engineer from 1992 to 2008; and Chief from 2008 to date. Prior to becoming Chief in 2008, my work in those positions was exclusively with all aspects of regulating stationary sources of air pollution, including, but not limited to, inspections, permitting, writing regulations, emission testing and enforcement.

3. I have been Chief of the RIDEM Office of Air Resources since 2008. In that capacity, I am responsible for planning and administering a statewide program to preserve, protect and improve the air resources of the state and to formulate and administer a comprehensive program for air pollution control and to do related work as required.

4. The regulations to implement the Regional Greenhouse Gas Initiative and the Clean Power Plan in Rhode Island are/will be administered and enforced by the RIDEM Office of Air Resources, which I manage and direct. Staff that work under my direction will be responsible for developing Rhode Island's compliance plan for the Clean Power Plan. I also regularly participate in Agency Heads meetings of the Regional Greenhouse Gas Initiative ("RGGI"), which I describe in greater detail below.

5. The purpose of this declaration is to provide my understanding of the State of Rhode Island's readiness to comply with the administrative and procedural requirements of the United States Environmental Protection Agency's ("EPA")

final rules regarding greenhouse gas emissions from existing power plants under Section 111(d) of the Clean Air Act, published in the Federal Register at 80 Fed. Reg. 64,661 on October 23, 2015, and titled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (the "Clean Power Plan").

6. The State of Rhode Island is concerned about the impacts of greenhouse gas emissions from the electric power sector, the single largest source of these emissions in the United States and the second largest source in Rhode Island. Rhode Island has recognized that there is a compelling need to reduce greenhouse gas emissions from the electric power sector to mitigate the harms from global climate change, including sea level rise; coastal and shoreline changes; increased severe weather events, flooding, storm surges, and coastal erosion; critical infrastructure vulnerability; and ecosystem, economic, and health impacts.

7. In an effort to address the impacts from global climate change Rhode Island enacted the Resilient Rhode Island Act of 2014–Climate Change Coordinating Council, R.I.G.L. § 42-6.2-1, *et seq*. (the "Resilient RI Act"). The purpose of the Resilient RI Act is to assess, integrate, and coordinate climate change efforts throughout state agencies to reduce greenhouse gas emissions, strengthen the resilience of communities, and prepare for the effects of climate

change, including, but not limited to, coordinating vulnerability assessments throughout state government.

8. The Resilient RI Act requires that a plan be produced that includes strategies, programs, and actions to meet targets for greenhouse gas emissions reductions in Rhode Island as follows:

(i) Ten percent (10%) below 1990 levels by 2020;

(ii) Forty-five percent (45%) below 1990 levels by 2035; and

(iii) Eighty percent (80%) below 1990 levels by 2050.

9. The State of Rhode Island strongly supports federal efforts to limit greenhouse gas emissions from the power sector. Federal action is essential given that only the federal government can set national guidelines and standards, which are necessary to maximize both emissions reductions and incentives for the development of cleaner sources of energy.

Clean Power Plan Rule

10. I have followed the development of the Clean Power Plan, including working with representatives of the Regional Greenhouse Gas Initiative states ("RGGI States") to provide information to EPA as it developed the proposed Clean Power Plan, including the RGGI States' comments in response to the pre-proposal opportunity to comment, and to prepare detailed comments on the proposed rule. (*See* December 2, 2013 Letter from RGGI States available at

http://rggi.org_States_111d_ Letter_Comments.pdf; November 5, 2014 Letter from RGGI States available at http://www.rggi.org/docs/PressReleases/PR110714_CPP_Joint_Comments.pdf; and December 12, 2014 Letter from RGGI States available at http://www.rggi.org/docs/PressReleases/PR120114_RGGI_SupplementalComments_CPP.pdf.

11. I participated in RIDEM's review of the Clean Power Plan, including preparation of RIDEM's December 1, 2014 comments to the EPA regarding the proposed Clean Power Plan.

12. I am familiar with the final Clean Power Plan. The rule establishes state goals for carbon dioxide (CO_2) emissions for reducing emissions at electric generating units. It also specifies guidelines for states to use in developing, submitting, and implementing state plans to achieve the rule's goals. In the final rule, the state goals were determined using subcategory-specific CO_2 emission performance rates that reflect the "best system of emissions reductions… adequately demonstrated" (BSER) from the power sector. In the final rule, state goals are in two forms: rate-based and mass-based CO_2 goals to provide states with flexibility in developing their plans, including utilizing allowance trading programs and other measures.

13. The Clean Power Plan requires that states submit compliance plans or initial submittals requesting an extension to EPA by September 6, 2016. States that are granted an extension must submit their final compliance plans by September 6, 2018. The Clean Power Plan also permits states to join together and submit joint compliance plans in lieu of state-specific plans.

14. The Clean Power Plan acknowledges, and provides mechanisms to credit, the State of Rhode Island's past, present, and future investments in renewable energy and energy efficiency. In particular, if the State elects to adopt a mass-based state plan, all of the State's low-carbon resources and demand reduction investments, whenever undertaken, will facilitate the State's overall achievement of Clean Power Plan goals.

15. The RIDEM also acknowledges that the Clean Power Plan provides incentives for early action, in the form of bonus emission reduction credits or carbon allowances, for renewable energy deployment and low-income energy efficiency programs that provide emission reductions in 2020 and 2021, before compliance requirements under Clean Power Plan state plans take effect.

16. The RIDEM also recognizes that the Clean Power Plan allows states *not* to submit a plan without any sanction or penalty, in which cases EPA will impose a federal plan. If a state elects not to submit a plan, a state will not have

any obligation to conduct planning, adopt legislation or regulations, or expend taxpayer resources under the Clean Power Plan.

17. The RIDEM understands that the Clean Power Plan seeks to reduce emissions from electric generating units and that the entities regulated under the Clean Power Plan are the owners and operators of electric generating units, not states themselves, state environmental or energy agencies, or other participants in the state's energy sector. In this regard, the Clean Power Plan is not dissimilar to other air emissions regulations applicable to electric generating units. The RIDEM further understands that there is no regulatory or funding sanction if a state does not submit an approvable plan to EPA under the Clean Power Plan regulations.

18. The State of Rhode Island has already begun its compliance planning efforts. As a RGGI participating state, Rhode Island has and will continue to participate in stakeholder outreach through RGGI-wide stakeholder meetings. The first of an on-going series of stakeholder meetings occurred on November 17, 2015 in New York City. Stakeholder meetings will be a combination of in-person meetings and meetings via webinar. In addition, written comments are accepted as well. The draft proposed schedule for stakeholder meetings can be found http://www.rggi.org/design/2016-program-review/rggi-meetings. The RIDEM will also schedule a state specific stakeholder workshop in the near future. The RIDEM will extend outreach to all interested parties including but not limited to

vulnerable, low income or minority communities. The RIDEM may use a combination of the following approaches for community engagement: post CPP related information and notices on the RIDEM website, RGGI page, local media (newspaper), social media tools (e.g. Twitter, Facebook), and utilize the RIDEM's Press & Communications Office. In addition, as a RGGI participating state, the RIDEM staff engage in weekly conference calls with RGGI counterparts in the region. These discussions are ongoing and relate to the compliance obligations of the RGGI states in respect to the Clean Power Plan and include topics such as modifications to the Carbon Dioxide Allowance Tracking system (COATS), possible changes to the RGGI Model Rule, and modeling requirements. These conversations are being held at both staff level Program Committee level as well as with the respective Agency Heads of RGGI.

19. As a result of the State of Rhode Island's research and planning on climate change and its work with EPA and other RGGI States, the RIDEM fully anticipates that it can meet the planning deadlines in the Clean Power Plan by filing an initial submission by September 6, 2016, and a final plan by September 6, 2018.

Regional Greenhouse Gas Initiative

20. RGGI is a market-based program to reduce greenhouse gas emissions from the electric power sector. RGGI is a cooperative effort among the

RGGI States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

21. The program requires power plants to possess a tradable CO_2 allowance for each ton of CO_2 they emit. The program was developed under a Memorandum of Understanding signed by initial member state governors in 2005 and implemented by the RGGI States in 2009.

22. RGGI is grounded in each state's own statutory and regulatory authorities. Each state's laws and regulations establish "CO_2 Budget Trading Programs" that limit emissions of CO_2 from electric power plants, create CO_2 allowances, determine appropriate allowance allocations, and provide for participation in CO_2 allowance auctions. *See* R.I. GEN. LAWS §§ 42-17.1-2(19), 23-23, 23-82; R.I. CODE R. 25-4-46:46, 47:47.

23. Under contracts with the RGGI States, RGGI, Inc., a non-profit corporation, administers regional auctions to sell CO_2 allowances. States sell nearly all emission allowances through auctions and invest most of the proceeds—over $2.2 billion through September 2015—in energy efficiency, renewable energy, and other consumer benefit programs. *See* Press Release, CO_2 Allowances Sold for $6.02 in 29th RGGI Auction; $152 Million Raised for Reinvestment on RGGI's Seventh Anniversary, September 11, 2015, *at* http://www.rggi.org/docs/Auctions/29/PR091115_Auction29.pdf.

24. Collectively, the states' CO_2 Budget Trading Programs establish an annually declining cap on CO_2 emissions from the power sector within the RGGI States. The RGGI program, in conjunction with other state clean energy polices and other energy market factors, has helped the RGGI States reduce carbon dioxide emissions by approximately 40 percent since 2005.

2012 Program Review

25. The RGGI States completed a two-year comprehensive program review in 2012. Following the review, the states established a new regional CO_2 budget that lowered the cap on emissions to 91 million tons in 2014, a reduction of 45 percent from the original cap. Under the program changes, the cap will decline 2.5 percent each year from 2015 to 2020. To implement the newly lowered cap, the RGGI States then revised their own CO_2 Budget Trading Programs through their state-specific legislative and regulatory processes.

26. Using their own processes for revising their respective legal authorities, the RGGI States successfully adopted statutory and regulatory changes in time for the lower regional cap to be in place for 2014 regional auctions. In Rhode Island, for example, the state Department of Environmental Management adopted changes to the regulations governing the state's CO_2 Budget Trading Program in their Air Pollution Control Regulation Nos. 46 and 47, revised on December 25, 2013.

27. The RGGI States' successful 2012 program review demonstrated their ability to work together to set new goals for regional emissions reductions while timely amending their individual state programs to reflect those goals. *See* Press Release, RGGI States Make Major Cuts to Greenhouse Gas Emissions from Power Plants, Jan. 13, 2014, *at* http://www.rggi.org/docs/PressReleases/PR011314_AuctionNotice23.pdf.

RGGI States and the Clean Power Plan

28. In their comment letters on the proposed Clean Power Plan, the RGGI States offered their support of the rule's framework, which provides states with flexibility to craft plans to meet state-specific emissions targets. The RGGI States also lauded the provisions of the proposed rule encouraging states to work together to develop multi-state compliance plans. *See* RGGI States' Comments on Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (November 5, 2014); RGGI States' Supplemental Comments on Proposed Clean Power Plan (Dec. 1, 2014), referenced in paragraph 10 *supra*.

29. Under the final Clean Power Plan, states will begin demonstrating initial compliance by January 1, 2022, and states may set their own interim goals between 2022 and 2029. The RGGI States are working together to consider submitting one multi-state compliance plan or individual state plans that rely on

RGGI as a compliance mechanism. The RGGI States currently have a plan for completing this multi-state effort in a timeframe that will allow for timely submission of state plans. For example, as discussed in paragraph 18 above, the RGGI-wide stakeholder process is underway and will continue into at least the summer of 2016. Additional stakeholder meetings will be added as needed and Rhode Island will hold a state-specific community workshop as well. The RIDEM is also coordinating with other State agencies, including the Office of Energy Resources and the Division of Public Utilities in the planning process.

30. The State of Rhode Island has in place the necessary authorities and administrative procedures to assure timely compliance with federal Clean Air Act rules, including the Clean Power Plan. In this regard, Rhode Island has decades of experience complying with other federal Clean Air Act rules that require comprehensive state planning to achieve compliance, including state implementation plans to achieve the National Ambient Air Quality Standards for criteria air pollutants. *See* 40 C.F.R. Part 52, Subpart OO (Rhode Island).

31. The RIDEM routinely and effectively coordinates with the Rhode Island Office of Energy Resources, our state energy agency, on issues of shared interest, including the impact of federal environmental regulations on the State's regulated industries and the State's power sector in particular. As with prior federal environmental regulations, the RIDEM is prepared to coordinate its work

under the Clean Power Plan among the State agencies with implicated jurisdiction or interests.

32. The State of Rhode Island has a demonstrated track record of efficiently working with counterparts in other states to develop harmonized and/or coordinated regulatory programs that implicate multiple states, including membership in RGGI and in the Northeast States for Coordinated Air Use Management ("NESCAUM"), an association of air quality agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

33. Based on the RGGI States' experience complying with federal Clean Air Act rules and their successful implementation of the RGGI program, I am confident that the RGGI States, including Rhode Island, are well equipped and will be able to comply with the state planning requirements of the Clean Power Plan in a timely fashion.

State Harms from a Stay of the Clean Power Plan

34. The State of Rhode Island has repeatedly sought to expedite EPA action to place federal limits on greenhouse gas emissions. These actions include pushing EPA to regulate Greenhouse gases (as a plaintiff in *MA v. EPA* (549 U.S. 497 (2007)); clarifying the federal government's role in Greenhouse Gas regulation (as a plaintiff in *AEP v. CT* (131 S.Ct. 2527 (2011)); supporting EPA in its

regulation of greenhouse gases (as an Intervenor in *UARG v. EPA* (573 U.S. ___ (2014)) and *Delta Construction v. EPA* (Nos. 11-1428, 11-1441, 12-1427 (D.C. Cir. petition for rehearing en banc denied Aug. 3, 2015)); and supporting EPA's proposed Clean Power Plan as an Intervenor in this action.

35. Staying the Clean Power Plan could delay long overdue reductions in emissions from the nation's power sector, which the State sees as essential to preventing the worst impacts of climate change. There is no guarantee that a stay will not result in postponements of the compliance deadlines in the Clean Power Plan even if the Plan is ultimately upheld. For example, in the recent litigation in this Court over EPA's Cross-State Air Pollution Rule, a rule that was eventually upheld after a remand from the Supreme Court, a stay issued at the outset of the litigation resulted in EPA postponing the compliance deadlines by three years. Any such postponements would delay compliance actions that states and/or private actors would otherwise have taken, resulting in emissions that will stay in the atmosphere for many years to come and aggravating the climate change harms to the State.

36. A stay will interfere with the State of Rhode Island's activities under other federal and state air programs and with State clean energy planning. As part of the 2012 Program Review (described in paragraphs 25-27 above), the RGGI States committed to commencing a comprehensive program review no later than

2016 to consider program successes, impacts, and other program design elements. The RGGI States will use the regional 2016 Program Review as an opportunity to receive comments from stakeholders and experts on potential program changes in pursuit of compliance with the Clean Power Plan. RGGI's Program Review would be adversely affected by the uncertainty associated with a stay of the Clean Power Plan. A stay in the Clean Power Plan would also increase the uncertainties of federal involvement and complicate the State's future climate change mitigation planning activities.

I declare under penalty of perjury that, to the best of my knowledge and belief, the foregoing is true and correct.

Executed on this 1st day of December, 2015.

/s/ Douglas L. McVay_____
Douglas L. McVay, Chief
Office of Air Resources
Rhode Island Department of Environmental Management

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF DICK PEDERSEN, DIRECTOR, OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

I, Dick Pedersen, hereby declare:

1. I make this declaration from my personal and professional knowledge. I would testify to the following facts if called as a witness at trial.

2. I am the Director of the Oregon Department of Environmental Quality (DEQ). I have been Oregon DEQ Director since 2008.

3. My agency's responsibilities include implementing air quality programs in Oregon, including developing and implementing policies and programs to comply with and implement the federal Clean Air Act, 42 U.S. C. §§ 7401 et. seq.

Impacts of Climate Change in Oregon

4. Oregon already is experiencing adverse impacts of climate change and these impacts are expected to become more pronounced in the future, significantly affecting Oregon's economy and environment. The Oregon Climate Change Research Institute, for example, has analyzed current climate change impacts and climate change models and has concluded that climate change already is causing significant impacts in Oregon and will continue to do so. *Climate Change in the Northwest: Implications for our Landscapes, Waters, and Communities, Executive Summary*. Dalton, M.M., P.W. Mote, and A.K. Snover, eds., Island Press, available at: http://occri.net/wp-content/uploads/2013/11/ClimateChangeInTheNorthwestExecutiveSummary.pdf. These impacts include:

a. The seasonal flow cycles of rivers and streams are changing due to warmer winters and decreased snowpack accumulation, as more precipitation falls as rain, not snow. Spring peak flows will come sooner, and late-summer flow will decrease, depleting Oregon's supply of summer water for agriculture, stream flows for wildlife, and an expected decrease in hydropower generation.

b. Ocean sea levels will rise between four and 56 inches on the Oregon coast by the year 2100, ocean waters will continue to become more acidified, and coastal cities will be threatened by increased flooding and erosion.

Increased ocean acidification will have a particular detrimental impact on some marine organisms like shellfish, which will threaten marine ecosystems, fisheries and aquaculture.

c. Fire activity is projected to increase due to warmer, drier summers, which will also exacerbate insect outbreaks in forests as drought stress increases forest vulnerability.

5. June 2015 was the hottest June on record in the Pacific Northwest, with two historic heat waves each lasting over ten days. Intense forest fires again burned in the region this year, with the Canyon Creek Complex fire burning over 110,000 acres as of November 2, 2015, and with total firefighting costs in Oregon of more than $200 million. Water temperatures in the Columbia River system were higher this year, earlier in the season, than in the previous ten years, and the higher water temperatures contributed to significantly lower than normal survival rates for sockeye salmon (see October 28, 2015 memorandum by the Columbia River Fish Passage Center, *Requested data summaries and actions regading sockeye adult fish passage and water temperature issues in the Columbia and Snake rivers* at http://www.fpc.org/documents/memos/159-15.pdf).

State Efforts to Combat Climate Change

6. Oregon has been concerned about the negative impacts of climate change for almost three decades and has been working on strategies to reduce and mitigate those impacts for nearly as long, beginning with the Governor's creation of the Oregon Task Force on Global Warming in 1988. The Oregon Legislature has established "the policy of this state to reduce greenhouse gas emissions in Oregon" and adopted greenhouse gas emission reduction goals for the State. ORS 468A.205. In furtherance of these goals, the Oregon Environmental Quality Commission has adopted a mandatory greenhouse gas reporting requirement for stationary emission sources, which the Legislature has expanded to apply to other sources. OAR chapter 340, division 215; ORS 468A.280. The Environmental Quality Commission also recently adopted the Oregon Clean Fuels Program, OAR chapter 340, division 257, requiring motor vehicle fuel providers to lower the lifecycle carbon emissions of fuel used in Oregon by ten percent by the year 2025.

7. In 2010, the EQC approved new regional haze reduction rules, pursuant to Clean Air Act requirements, that will require Portland General Electric's Boardman power plant, Oregon's only operational coal-fired power plant, to permanently shut down by 2020. OAR 340-223-0080. In adopting this plan, the Oregon Department of Environmental Quality concluded that

implementation of the shutdown plan would permanently eliminate approximately 4,000,000 tons per year of greenhouse gasses and all of the plant's mercury emissions, which currently range from 137 to 281 pounds per year, among other environmental and health benefits.

8. But while Oregon has been making good progress on reducing greenhouse gas emissions, more must be done to meet reduction goals and arrest climate change globally. For example, in 2013, the Oregon Global Warming Commission concluded that, "Oregon met its 2010 greenhouse gas reduction goal, having arrested the growth of greenhouse gas emissions and, it appears, also establishing a downward emissions trajectory in which emission levels are expected to be reduced into the future." *Report to the Legislature*, Oregon Global Warming Commission (2013). But the Commission also counseled that further strides must be made if Oregon is to meet its 2020 and 2050 greenhouse gas reduction goals. This report can be found at: http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/OGWC_2013_Rpt_Leg.pdf.

Federal Action to Reduce CO2 Emissions is Essential

9. Oregon has taken significant steps to begin to reduce CO2 emissions from power plants, but for a comprehensive solution to climate change, the federal

government and other states must also take action. Only concerted action across the entire United States will achieve all of the necessary reductions in CO2, and only the federal government can set national guidelines and standards to maximize both emissions reductions and incentives for the development of cleaner sources of energy. Furthermore, United States leadership on emission reductions will support global action, and the Clean Power Plan is an essential element of our national effort.

10. Any delays or disruptions to the Clean Power Plan risk making it more costly to achieve substantial greenhouse gas reductions in the future, and could jeopardize our very ability to reduce emissions to a level that is needed to avoid the worst impacts of climate change. For these reasons, and those I discuss below, Oregon would be harmed by any judicial decision to delay or disrupt implementation of the Clean Power Plan.

Oregon's Efforts to Implement the CPP Have Begun

11. Oregon is not part of any regional greenhouse gas reduction regulatory program, but Oregon will be able to use the numerous analytical and regulatory efforts described above, and also described in the Declaration of Jason Eisdorfer, Utility Program Director at the Oregon Public Utility Commission, to develop our implementation plan for the Clean Power Plan.

12. The Department of Environmental Quality (DEQ) has begun working closely with the Oregon Department of Energy (Energy Department) and the Oregon Public Utility Commission (PUC) to develop the state's compliance plan. These agencies have held individual and open forum meetings with stakeholders, including an initial, open stakeholder meeting on October 27, 2015, that included representatives from power companies, environmental organizations, and ratepayer organizations. The group discussed stakeholder input received to date, criteria for evaluating compliance options, conceptual compliance scenarios, and the proposed process that will be used to develop Oregon's plan.

13. These Oregon agencies are working together to analyze plan compliance options and to develop criteria to assess the best compliance plan for Oregon. Factors under consideration include cost and risk to Oregon utility ratepayers, effect on CO2 emissions, cost to energy suppliers, effect on reliability of the electricity system, administration requirements, and connections and compatibility with other Oregon policies.

14. The agencies also have developed a planning timeline and schedule to meet the planning deadlines in the Clean Power Plan and fully anticipate making an initial submission to EPA by September 6, 2016.

15. As required under Oregon law (Oregon Revised Statute 182.545), Oregon's planning process will include engaging in public outreach to minority

and low-income communities that may be affected by the program. Oregon intends to engage in that public outreach process in 2016, to consider their input and concerns regarding program impacts, and to identify opportunities to address those concerns and to mitigate any potential disparate impacts on such communities. This outreach also offers an opportunity for Oregon's planning process to identify ways to reduce or mitigate existing impacts on these communities. In particular, stakeholders in Oregon have expressed strong interest in EPA's proposed Clean Energy Incentive Program which will spur further investment in energy efficiency programs in low income communities.

16. Oregon has sufficient personnel, time and resources to develop our compliance plan with the Clean Power Plan, and this is due in part to the fact that the requirements of this process will be very similar to the planning process DEQ has engaged in to comply with prior Clean Air Act requirements. The Clean Power Plan imposes no new or different burdens beyond the procedures Oregon used to develop its Clean Air Act State Implementation Plan (SIP), and that it continued to use to develop particular Nonattainment and Maintenance area plans and other required SIP amendments under Section 110 of the Clean Air Act.

17. Specifically, Oregon has a well-established process by which we will analyze the impacts of the final rule, consult with stakeholders, draft necessary regulatory or statutory changes, and prepare the appropriate documentation to

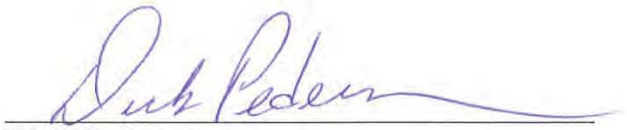
provide to EPA. We have developed extensive expertise in this process through our efforts with other air pollutants.

18. Over the past 10 years, for example, Oregon has developed three specific area plans to achieve national emission standards for particulate matter and ozone, completing all of them within required EPA deadlines. In May 2007, DEQ completed the Portland-Salem Ozone Maintenance Plan, to ensure that area continues to meet the 8-hour ozone national ambient air quality standard adopted by EPA. EPA approved the plan in December 2011. In August 2007, DEQ completed the Salem-Keizer Carbon Monoxide Limited Maintenance Plan, to ensure that that area continues to meet EPA's carbon monoxide national ambient air quality standard. EPA approved the plan in December 2008. And, finally, DEQ completed the Klamath Falls PM 2.5 Attainment Plan in December 2012, to bring that region back into compliance with the 24-hour small particulate national ambient air quality standard adopted by EPA. EPA approved the plan in August 2015.

19. Oregon is proud of the steps we have already taken to combat climate change and of our clean energy investment strategy, and we are in a good position to comply with the Clean Power Plan. If states collaborate and cooperate, the Clean Power Plan offers the United States a path toward finally addressing the real and pressing issue of climate change on an integrated and least cost basis.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 4, 2015.



Dick Pedersen
Director, Oregon Department of Environmental Quality

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF JARED SNYDER, ASSISTANT COMMISSIONER NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

I, Jared Snyder, hereby declare:

1. I am the Assistant Commissioner for Air Resources, Climate Change, and Energy at the New York State Department of Environmental Conservation ("Department"). I have served in this role since joining the Department in 2007. My responsibilities as Assistant Commissioner include oversight of the Department's regulations implementing the Clean Air Act ("Act"), including submission of State Implementation Plans ("SIPs") and state plans to the U.S. Environmental Protection Agency ("EPA"), and coordination and implementation of state programs and policies to reduce greenhouse gas emissions. Part of my duties currently include coordinating the Department's response to EPA's final

Clean Power Plan rule under Section 111(d) of the Act, *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule*, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan"). This involves evaluation of state plan options under the Clean Power Plan, outreach with stakeholders regarding the State's implementation of the Clean Power Plan, and ultimately the submission of a state plan to EPA to comply with the Clean Power Plan.

2. I have personal knowledge and experience regarding the Clean Power Plan, the Regional Greenhouse Gas Initiative ("RGGI"), and New York State's SIP submissions to EPA under the Act. This includes following the development and finalization of the Clean Power Plan rule, providing information and comments to EPA regarding the Clean Power Plan, working with representatives of other states on the development and implementation of the RGGI program,[1] and serving as the Department's primary official responsible for oversight of SIP submissions to EPA. I also currently serve as a Director on the RGGI, Inc. Board of Directors, and will serve as the Vice Chair of the RGGI, Inc. Board of Directors in 2016.

3. The purposes of this declaration are to: (i) briefly summarize existing state programs to reduce greenhouse gas emissions from the electric power sector;

[1] In addition to New York, the other states currently participating in RGGI are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, Rhode Island, and Vermont (collectively the "RGGI States").

(ii) describe activities the Department and the State have taken to evaluate the Clean Power Plan; (iii) provide examples of prior instances in which the Department has implemented regulatory programs applicable to the energy sector, prepared and submitted state planning documents to EPA under the Act, and collaborated with other states and entities such as the New York Independent System Operator ("NYISO"); and (iv) explain the State's readiness and ability to comply with the administrative and procedural requirements of the Clean Power Plan.

I. Existing State Programs to Reduce Greenhouse Gas Emissions

4. The State is already experiencing the impacts of climate change, and has recognized the urgent need to reduce the greenhouse gas emissions that contribute to climate change. For example, heat waves, coastal flooding, and riparian flooding will continue to threaten the State's environmental, social, and economic systems. The State has already been subject to an increase in extreme precipitation, with the Northeast experiencing a greater increase in extreme precipitation than any other region in the nation. Sea-level rise along New York's Atlantic coast has exceeded 18 inches since 1850. In 2011, Hurricane Irene and Tropical Storm Lee ravaged New York. A year later, Hurricane Sandy killed at least 61 New Yorkers and caused more than $50 billion in damage. Researchers estimate that sea-level rise since 1900 alone resulted in the flooding of

approximately 80,000 additional residents from Sandy, and sea-level rise alone will increase the costs from storms like Sandy in the future.

5. As a result of these impacts and for other reasons, New York State is committed to reducing greenhouse gas emissions, including by limiting those emissions from the electric power sector. The electric power sector is the largest source of greenhouse gas emissions across the country, and one of the largest sources of those emissions in the State.[2]

6. New York State has long supported federal efforts to limit greenhouse gas emissions, including through EPA regulation of the electric power sector under the Act. For example, as far back as 2008, the Department submitted comments to EPA on the Advance Notice of Proposed Rulemaking, *Regulating Greenhouse Gas Emissions under the Clean Air Act*, 73 Fed. Reg. 44,354 (July 30, 2008). More recently, even before EPA proposed the Clean Power Plan, New York joined the RGGI States in submitting comments to EPA supporting the regulation of greenhouse gases from the electric power sector under Section 111(d) of the Act.

7. In the absence of federal limits on greenhouse gas emissions from power plants, the State has implemented various programs to reduce those

[2] See U.S. Greenhouse Gas Inventory Report: 1990-2013, available at: http://www3.epa.gov/climatechange/ghgemissions/usinventoryreport.html; New York State Greenhouse Gas Inventory and Forecast: Inventory 1990-2011 and Forecast 2012-2030, Final Report April 2014, Revised June 2015, available at: http://www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-Prices/Energy-Statistics/greenhouse-gas-inventory.pdf.

emissions from the electric power sector. For example, in 2012 the Department adopted regulations limiting carbon dioxide ("CO_2") emissions from new and expanded power plants. See *CO_2 Performance Standards for Major Electric Generating Facilities*, N.Y. Comp. Code R. & Regs. (NYCRR), tit. 6, Part 251, ("Part 251"). In addition, the State participates in RGGI, which is a multi-state market-based program that has set a limit on CO_2 emissions from both new and existing power plants since 2009. The Department implemented RGGI in New York through adoption of and revisions to its *CO_2 Budget Trading Program*, 6 NYCRR Part 242, ("Part 242") regulations.

8. New York has implemented these and other programs to reduce greenhouse gas emissions from the electric power sector without significant negative impacts to the economy or electric system reliability. In fact, CO_2 emissions from power plants covered by RGGI in New York have decreased by approximately 45% since 2005, while the state economy has grown by 8%. And according to independent analyses, the RGGI program has provided close to $700 million in economic benefits to the State, saving electricity consumers more than $200 million, and saving the State more than $400 million dollars in avoided fuel costs.[3]

[3] See The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States, Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period, Nov. 15, 2011, available at:

9. I coordinate with officials from other New York State agencies and authorities, including the New York State Public Service Commission and Department of Public Service (collectively "PSC") and New York State Energy Research and Development Authority ("NYSERDA"), to implement New York State's policies to reduce greenhouse gas emissions. These policies are in furtherance of the State's overall goal of reducing greenhouse gas emissions by 80 percent from 1990 levels by 2050. In addition to Part 251 and RGGI, this includes existing programs to transition to a clean energy economy and reduce greenhouse gas emissions from the electric power sector, such as:

a. PSC's Reforming the Energy Vision ("REV") initiative, which aims to achieve wholesale changes in the regulatory and market structures of the State's energy system, including to promote cleaner and more distributed sources of energy, increase resiliency and reliability, and empower consumers with additional choice.

b. The State Energy Plan, which establishes the State's clean energy goals for 2030, including: (i) achieving a 40% reduction in greenhouse gas emissions from 1990 levels from the energy sector; (ii)

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http://www.dec.ny.gov/docs/administration_pdf/ag11rggi.pdf; The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States, Review of RGGI's Second Three-Year Compliance Period (2012-2014), July 14, 2015, available at: http://www.dec.ny.gov/docs/administration_pdf/ag15rggi.pdf.

generating 50% of electricity from renewable energy sources; and (iii) decreasing energy consumption in buildings by 23% from 2012 levels.

10. I am currently collaborating with PSC and NYSERDA regarding the implementation of REV, the State Energy Plan, and the Clean Power Plan. This collaboration will provide the State with the ability to implement the Clean Power Plan in conjunction with its other programs and policies regarding the electric power sector.

II. Evaluation of Clean Power Plan and Options for States

A. Development of Clean Power Plan

11. I have followed the development of the Clean Power Plan since at least 2013. For example, prior to EPA's proposal of the Clean Power Plan, I worked with representatives of the RGGI States to develop and submit comments supporting EPA's regulation of greenhouse gases from the power sector under Section 111(d) of the Act. These pre-proposal comments also included recommendations to EPA about such a regulation, such as providing flexibility to states to determine the appropriate compliance mechanism, allowing for the use of mass-based compliance approaches, and encouraging the use of multi-state programs.

12. I reviewed EPA's proposed Clean Power Plan, 79 Fed. Reg. 34,830 (June 18, 2014) ("Proposal"). The Proposal included many of the

recommendations the RGGI States made in the pre-proposal comments, including providing flexibility to states to build their own plans, allowing for mass-based programs, and facilitation of regional programs that include multiple states working together.

13. I worked with officials from the RGGI States to evaluate the Proposal, and to develop and submit comments to EPA on the Proposal. In their comment letters, the RGGI States supported the basic structure of the Clean Power Plan and provided recommendations to EPA to strengthen the final rule. See RGGI States' Comments on Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Nov. 5, 2014), Document ID EPA-HQ-OAR-2013-0602-22395; RGGI States' Supplemental Comments on Proposed Clean Power Plan (Dec. 1, 2014), Document ID EPA-HQ-OAR-2013-0602-24208.

14. In addition to working together with the RGGI States, I worked with other New York State officials to evaluate the Proposal and its potential impacts on the State. Together with PSC and NYSERDA, the Department submitted comments to EPA on the Proposal. See New York State Comments on Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources (Dec. 1, 2014), Document ID EPA-HQ-OAR-2013-0602-23627. In addition to generally supporting the Proposal, New York State's comments included recommendations

to EPA regarding the methodology used by EPA to calculate the State's CO_2 emission goal.

B. Final Clean Power Plan Rule

15. The State has completed a review of the final Clean Power Plan and associated rulemaking documents. This includes my own review and assessment of the rule, evaluation of the final rule by other Department staff, collaboration with PSC and NYSERDA regarding the final rule, and discussions with NYISO, entities that would be subject to the state plan, and other stakeholders.

16. As a result of the State's prior efforts to evaluate and comment on regulation of greenhouse gases under Section 111(d) and the Proposal, as well as other activities, the State had an understanding of the basic structure of the Clean Power Plan even before EPA finalized the rule. This includes that EPA would set state-specific CO_2 emission goals that each state must meet, based on CO_2 emission performance rates reflecting the "best system of emission reduction" for existing fossil-fueled power plants as determined by EPA. Moreover, the final rule specifies guidelines for states to use in developing, submitting, and implementing state plans to achieve the rule's CO_2 emission goals. The final Clean Power Plan provides states with flexibility in developing their plans, including utilizing allowance trading programs like RGGI, working with other states, and other

measures. EPA did not significantly change this basic structure of the Clean Power Plan between the Proposal and the final rule.

17. EPA did, however, constructively address many of the issues raised by the RGGI States in their comments and by New York State in its own comments. The final Clean Power Plan, for example, includes state-specific CO_2 emission goals that better reflect progress already made by states like New York in reducing emissions, as well as additional emission reduction opportunities achievable in other states. Moreover, consistent with comments made by the RGGI States and New York, the final Clean Power Plan includes mass-based compliance options for states, facilitates the use of emissions trading for compliance, and clarifies certain issues regarding interstate collaboration.

C. Other Options Available to States

18. The Clean Power Plan provides states with the option of not submitting a state plan. In that case, EPA would not impose any sanctions on the state, such as the withholding of federal funds from the state. 40 C.F.R. § 60.5736. Instead, EPA would impose a federal plan, which is currently available for public comment. See *Federal Plan Requirements for Greenhouse Gas Emissions from Electric Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; Proposed Rule*, 80 Fed. Reg. 64,966 (Oct. 23, 2015) ("Proposed Federal Plan").

19. The Proposed Federal Plan also includes model rule language. This model rule language can be adopted by states for their own state plans under the Clean Power Plan. The model rule language may also be tailored by states in development of their state plans. This is similar to the processes described below, in which the RGGI States each adopted individual state regulations within approximately 24 months of the issuance of a final RGGI Model Rule in 2007, and adopted revisions to individual state regulations within approximately eleven months of the issuance of a revised RGGI Model Rule in 2013.

20. Because of the availability of the Proposed Federal Plan and associated model rule language, states do not need to devote significant time or resources to developing a state plan under the Clean Power Plan. Instead, states have the option of being subject to a federal plan, or of using model rule language contained in the Proposed Federal Plan.

21. Even for states that become subject to a federal plan, the Clean Power Plan still provides flexibility for states. For example, even after a federal plan has been implemented in a state, the federal plan will be withdrawn if and when EPA approves a plan submitted by the state. See 40 C.F.R. § 60.5720(b).

III. Examples of Prior Power Sector Regulations and Planning Efforts

22. The Department has extensive experience developing and implementing regulations applicable to the energy sector. This includes, for

example, the promulgation of Part 242 and Part 251 regulating CO_2 emissions from power plants, as well as regulations for other non-greenhouse gas pollutants. Before implementing these types of regulations applicable to the energy sector, the Department collaborates with entities such as NYISO, PSC, and NYSERDA, discussing, among other things, any issues regarding potential impacts to reliability or electricity cost. This experience will provide a useful framework for collaboration regarding electricity planning and utility regulation as the State develops and implements a plan to comply with the Clean Power Plan.

A. RGGI Implementation and Program Review

23. RGGI is one example of a program the State has developed and implemented to reduce greenhouse gas emissions from the power sector. RGGI is a market-based program to reduce CO_2 emissions from power plants, and is a cooperative effort amongst the RGGI States.

24. RGGI was initially developed through a collaborative process amongst the RGGI States. This included dialogue amongst the states, coordination amongst the environmental and energy agencies within each state, discussions with NYISO and the other relevant regional organizations, modeling of the electricity sector under various scenarios, and interaction with stakeholders and experts to obtain input regarding the design of the RGGI program.

25. The RGGI program is grounded in each state's own statutory and regulatory authorities. Following the initial development process, the RGGI States collectively drafted a Model Rule containing model regulatory language that could be used to implement the RGGI program in each state. The RGGI States issued a final Model Rule with technical corrections on January 5, 2007. See Regional Greenhouse Gas Initiative Model Rule, Final with Corrections, available at: http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf.

26. Each of the RGGI States then used this Model Rule as the basis for developing its own regulation and implementing RGGI through its own statutory and/or regulatory processes. As a result, each state established a "CO_2 Budget Trading Program" regulation that contained substantially similar provisions.[4] These regulations became effective in each state by the end of 2008, or within approximately 24 months of the release of the final corrected Model Rule. During the interim period between the release of the Model Rule and the adoption of individual state regulations, as part of individual state rulemakings, New York and other states participating in RGGI worked together with relevant independent

[4] See Conn. Agencies Regs. § 22a-174-31; Del. Admin. Code tit. 7, ch. 1147; 06-096 Me. Code R. 156; Md. Code Regs. 26.09; 310 Mass. Code Regs. 7.70; N.H. Code Admin. R. Env-A 4600, 4700; N.Y. Comp. Codes R. & Regs. tit.6, § 242; R.I. Code R. 25-4-46:46; Vt. Code R. 12-031-002.

system operators and public utility commissions to assess electricity cost and reliability issues.

27. The primary requirement of the RGGI program, as implemented by each state's CO_2 Budget Trading Program, is for each power plant subject to the program to obtain a tradeable CO_2 allowance for each ton of CO_2 it emits over a compliance period. RGGI's first three-year compliance period began on January 1, 2009, within just a few months of when each of the RGGI States established its individual CO_2 Budget Trading Program. At the end of the compliance period, each power plant must make such CO_2 allowances available to the Department, or to the environmental agency in the relevant RGGI state, for permanent deduction.

28. Collectively, the RGGI States' CO_2 Budget Trading Programs establish a declining cap on CO_2 emissions from the power sector within the RGGI States. Since 2005, CO_2 emissions from power plants covered by RGGI have decreased by approximately 45% across the RGGI States.

29. After the initial three-year compliance period (2009-11) of effective program operation, the RGGI States conducted a comprehensive Program Review in 2012. This Program Review assessed the benefits and impacts of the program to date, and evaluated potential options for changes to the RGGI program. The 2012 Program Review included many of the same components as the initial development of the RGGI program, including coordination amongst the environmental and

energy agencies of each state, outreach to stakeholders, and electricity sector modeling.

30. Following this 2012 RGGI Program Review, the RGGI States established a new regional CO_2 emissions cap of 91 million short tons, a 45 percent reduction from the original regional cap. Moreover, under the program changes following the 2012 Program Review, the cap will decline by 2.5 percent each year from 2015 through 2020.

31. To implement these and other changes to the RGGI program, the RGGI States first collectively developed revisions to the RGGI Model Rule. The RGGI States issued a revised Model Rule on February 7, 2013. See RGGI Model Rule, Issued February 7, 2013, Revised December 23, 2013, available at: http://www.rggi.org/docs/ProgramReview/_FinalProgramReviewMaterials/Model_Rule_FINAL.pdf. Each state then revised its own CO_2 Budget Trading Program through state-specific statutory and/or regulatory processes. In New York State, the Department proposed amendments to its Part 242 regulation on July 10, 2013, and adopted such amendments effective on January 1, 2014. The RGGI States all successfully adopted regulatory changes in time for the new lower regional cap to be in place for 2014, or within approximately eleven months of the release of the revised RGGI Model Rule.

32. Therefore, on two separate occasions, the State has successfully worked with other states to develop and implement a cooperative regulatory program for reducing greenhouse gas emissions from power plants. On both occasions, this included many of the same elements that may be required for states to develop and implement state plans under the Clean Power Plan, such as electricity sector modeling, collaboration with environmental and energy agencies, outreach to stakeholders, interaction with Independent System Operators/Regional Transmission Organizations, and individual state legislative and/or regulatory processes. Moreover, many of the steps taken by the RGGI States to design the RGGI program may not be necessary for states developing a state plan under the Clean Power Plan, because of the availability of existing regulatory language and other materials for states under the Clean Power Plan.

33. New York State's experience in developing, implementing, and revising the RGGI program provides a useful framework for potential collaboration by other states in submitting a plan for compliance under the Clean Power Plan. It also demonstrates the ability of states to develop common regulatory language, and then independently implement such language expeditiously though each state's own statutory and regulatory processes.

B. SIP Submittal and Federal Regulatory Review

34. The Department has decades of extensive experience developing plans for submittal to EPA under the Act. Most notably, this includes the development and submittal of SIPs to meet and maintain relevant National Ambient Air Quality Standards ("NAAQS") for criteria pollutants under the Act. The process for developing SIPs and submitting SIPs to EPA for approval shares many similarities with the process for developing and submitting a state plan to EPA for approval under the Clean Power Plan. At the same time, certain elements of many SIP processes will not be part of the state plan development process under the Clean Power Plan, such as complex ambient air quality modeling analyses.

35. Part of the SIP process includes working with EPA to understand federal regulatory requirements. For example, Department staff frequently discuss applicable requirements with EPA staff, and then incorporate any feedback from these discussions into SIP submittals. This is similar to the ongoing process with EPA staff regarding the Clean Power Plan, in that Department staff are engaged in an ongoing dialogue with EPA staff regarding specific provisions of the Clean Power Plan, which in turn informs evaluation of state plan options under the Clean Power Plan.

36. The SIP process typically includes the promulgation of regulations by the Department as well as emissions inventory projections and complex ambient

air quality modeling analyses. As part of SIPs, the Department commonly promulgates new regulations, or revises existing regulations, applicable to the electric power sector. Moreover, the establishment of such regulations is often subject to a timeline established by EPA, which is sometimes shorter than that provided for state plan submittal under the Clean Power Plan.

37. Department staff routinely evaluate changes to federal standards under the Act, including standards applicable to the electric sector. This evaluation includes an assessment of the impact of any federal regulation on the State's electric power system, and frequently involves coordination with PSC, NYSERDA, and NYISO.

38. In addition to regulatory changes to meet or maintain a NAAQS and submit a SIP, the Department routinely promulgates regulations to implement other federal standards under the Act. The process of responding to new EPA regulations, including by making changes to Department regulations, is therefore familiar to me and to Department staff.

39. The Department's familiarity with SIP preparation and review of federal regulations will serve to facilitate its response to the Clean Power Plan. The processes the Department undertakes to prepare SIPs and respond to other relevant EPA regulations are similar to what the Department is currently undertaking in response to the Clean Power Plan.

C. Other Planning Efforts and Regional Collaboration

40. The State has conducted numerous analyses of the electric power sector in support of various policies and regulations. In addition to modeling and other analyses to support RGGI and SIPs, this also includes analyses in support of other air regulations, clean energy policies such as the REV initiative and State Energy Plan, and other programs. These efforts have been ongoing for years and will help inform evaluation of options for the State under the Clean Power Plan.

41. The Department has also worked effectively with its counterpart agencies in other states to develop coordinated regulatory programs implicating the laws of multiple states. In addition to RGGI, this also includes participation in the Ozone Transport Commission and development of SIPs in collaboration with other states. For example, the Department regularly coordinates SIP submissions for ozone and fine particulate matter (PM 2.5) non-attainment with the neighboring states of Connecticut and New Jersey. This coordination includes inventorying of emissions and projections, air quality modeling, and emission reduction strategies reflected in individual state rulemakings.

IV. New York's Ability to Develop a State Plan

A. Coordination with Other Policies

42. While the Clean Power Plan requires states to submit plans to EPA for compliance, actual regulatory requirements under a state plan will be applicable

to owners or operators of affected electric generating units, and not states, environmental or energy agencies, or other organizations. In this respect, the Clean Power Plan is similar to other air emission regulations applicable to the electric power sector.

43. Moreover, because of this similarity to other air emission regulations and for other reasons, I do not expect the Clean Power Plan to interfere with the State's other energy and environmental policies, including other programs to reduce greenhouse gas emissions from power plants. The Department's ongoing coordination with PSC, NYSERDA, and NYISO regarding the implementation of policies applicable to the electric power sector will enable the State to allocate staff resources efficiently.

44. Furthermore, many of the State's other policies, such as the REV initiative and the State Energy Plan, are intended to help serve some of the same objectives as the Clean Power Plan. For example, many of these other policies are aimed, in part, at reducing greenhouse gas emissions, accelerating the transition to cleaner and renewable energy sources, and reducing other air pollutants. In this way, the Clean Power Plan is complementary to the State's existing efforts under State law.

B. State Plan Timing and Submittal

45. The Clean Power Plan requires that, by September 6, 2016, states submit to EPA either a final state plan or an initial submittal requesting an extension. 40 C.F.R. § 60.5760. In order to be granted by EPA, an initial submittal requesting an extension must contain only minor and non-binding information, including: (1) an identification of the final plan approaches under consideration and a description of progress made to date; (2) an explanation of why additional time is necessary to submit a final state plan; and (3) a description of the opportunities for public comment and meaningful engagement with stakeholders during preparation of the initial submittal, and plans for engagement during development of the final plan. See id.; id. § 60.5765; EPA Memorandum from Stephen D. Page to Regional Air Directors, Initial Clean Power Plan Submittals under Section 111(d) of the Clean Air Act, October 22, 2015, available at: http://www3.epa.gov/airquality/cpptoolbox/cpp-initial-subm-memo.pdf. For those states granted an extension, a final state plan must be submitted to EPA by September 6, 2018. 40 C.F.R. §§ 60.5760, 60.5765. Therefore, states have almost three years from the finalization of the Clean Power Plan to the extended deadline for final state plan submittal. For the reasons described in this declaration, the Department can readily meet the initial and final submittal deadlines.

46. In addition to the availability of this almost three-year period for final state plan submittal to EPA, the final CO_2 emission goals in the Clean Power Plan do not need to be achieved until 2030. See 40 C.F.R. §§ 60.5770, 60.5855. Furthermore, the final rule establishes less stringent state-specific interim CO_2 emission goals, which must be achieved on average or in aggregate over the eight-year interim period from 2022-2029. See id. States therefore have flexibility in determining the pace of emission reductions over the interim period. In other words, actual requirements on affected power plants will not become effective until 2022 under the Clean Power Plan, and even then will only be based on a phased-in interim goal that is less stringent than the final goal for 2030.

C. Development of State Plan

47. The State has already begun its efforts to develop a state plan for compliance with the Clean Power Plan. In addition to evaluation of the various plan approaches available to states under the Clean Power Plan, these efforts include stakeholder outreach, ongoing modeling and other analyses of the electric power system, collaboration with NYISO, PSC, and NYSERDA, and discussions with officials representing the RGGI States.

48. The State is conducting two parallel stakeholder outreach processes. These include:

a. New York State-specific outreach, including discussions with entities that would be subject to the state plan to comply with the Clean Power Plan, NYISO, non-governmental organizations, and environmental justice communities. The Department has already held initial focus group meetings with two of these groups to discuss development of the state plan and implementation of the Clean Power Plan, including on November 2, 2015 with representatives of entities that would be subject to the state plan, and on November 20, 2015 with non-governmental organizations. The Department plans to hold a webinar with representatives of environmental justice organizations on December 11, 2015, which will also include discussion of plans for additional engagement with communities across the State.

b. Stakeholder outreach together with the RGGI States. The outreach by the RGGI States began with a meeting in New York City on November 17, 2015, and included discussion of electricity sector modeling, key topics regarding RGGI program review, and potential compliance under the Clean Power Plan. This includes the potential for compliance together with other states, such as through the addition of new RGGI participating states, naming additional trading partners, or the so-called “trading ready” mechanism under the Clean Power Plan. The RGGI States also released

materials explaining plan options available under the Clean Power Plan, describing key items for RGGI program review, listing draft assumptions for electricity sector modeling, and providing an anticipated schedule of additional stakeholder outreach. See November 17 Meeting Materials, available at: http://www.rggi.org/design/2016-program-review/rggi-meetings.

49. The RGGI States are currently conducting electricity sector modeling and other analyses to support review of the existing RGGI program and potential compliance options under the Clean Power Plan. This includes the use of modeling to project emissions, CO_2 allowance prices, electricity prices, and other variables under various Clean Power Plan compliance scenarios.

50. In addition to this electricity sector modeling being conducted by the RGGI States, New York is conducting its own modeling and other analyses to support electricity sector planning, which will inform consideration of state plan options under the Clean Power Plan. This includes the State Resource Planning effort, which is a collaborative study that includes participation by staff from the Department, NYSERDA, and PSC, in addition to participation of NYISO and regulated utilities. This effort is intended, in part, to assess the State's electricity system to ensure that it meets various public policies and regulations by 2030, including the Clean Power Plan, while maintaining reliability with the least

economic impact to consumers. This effort is complementary to the State Energy Plan and other ongoing state programs, and will be able to accommodate considerations regarding the State's implementation of the Clean Power Plan.

51. The Department collaborates with NYISO on an ongoing basis regarding the implementation of certain of its environmental regulatory programs. For example, Department staff periodically attend meetings (either in-person or via teleconference) of NYISO's Electric System Planning, Market Systems, and Installed Capacity Working Groups. Department staff also meet with the New York State Reliability Council every two months, which includes participation by NYISO. This also includes collaboration with NYISO regarding the development and implementation of RGGI and regarding the Clean Power Plan. The Department has already begun discussions with NYISO regarding state plan options under the Clean Power Plan, including on November 19 and 20, 2015 at NYISO's Environmental Advisory Council's Fall Meeting. Based on my discussions with NYISO representatives, my understanding is that NYISO has reviewed the final Clean Power Plan and has preliminarily concluded that EPA addressed many of the key concerns NYISO raised in its public comments on the Proposal.[5]

[5] See, e.g., NYISO, EPA Clean Power Plan, Preliminary Assessment of Impact on New York, October 27, 2015, available at: http://www.nyiso.com/public/media_room/publications_presentations/index.jsp.

D. Department's Ability to Meet Clean Power Plan Deadlines

52. The Department has sufficient staff, time, and resources to evaluate options for the State under the Clean Power Plan, conduct relevant coordination and stakeholder outreach activities, perform appropriate analyses, and ultimately prepare its initial submittal. Based on the three required components of an initial submittal, as described above, the Department will, at a minimum, be in a position to obtain the two-year extension for submittal of a final state plan.

53. The Department has the ability to conduct the activities necessary to develop and implement a final state plan under the Clean Power Plan. This is partly because of prior experiences by the Department in implementing similar programs applicable to the electric power sector, such as the preparation of SIPs.

54. Based on my personal knowledge and experience, and the State's prior experience, I am confident that the State will be able to meet the deadlines established for state submittals under the Clean Power Plan. At a minimum, this includes the filing of an initial submittal by September 6, 2016, and a final state plan by September 6, 2018.

E. Impacts of Potential Stay

55. The ability of the State to effectively coordinate the Clean Power Plan with other energy sector policies and planning efforts could be negatively impacted by any stay of the Clean Power Plan. This is partly because a stay may not

ultimately result in postponement of the submittal or compliance deadlines under the Clean Power Plan, and the State is currently working towards meeting those deadlines.

56. Any stay may also delay actions that other states or affected power plants would otherwise have taken to prepare for compliance with the Clean Power Plan. This could interfere with states' energy planning efforts that may be accounting for the Clean Power Plan, delay actions that would otherwise reduce greenhouse gas emissions, or make it more costly for states and affected power plants to comply with the rule.

57. Any stay of the Clean Power Plan would also impair opportunities for multi-state collaboration. This is because states would not be able to fully assess their options for state plan approaches under the Clean Power Plan. For example, part of a state's consideration of plan approaches may depend on the compliance paths being pursued by other states, such as whether a state intends to be "trading ready" under the Clean Power Plan. If states do not provide an initial indication of the plan approach or approaches under consideration, then states may not be able to accurately conduct electricity sector modeling or other analyses of Clean Power Plan implementation.

58. Any delay in reducing greenhouse gas emissions, such as a delay that might result from a stay of the Clean Power Plan rule, will have negative impacts

on the State. This is because of the urgent need to reduce greenhouse gas emissions from the nation's power sector. The State has long supported federal efforts to limit greenhouse gas emissions, as such action is essential to limiting the impacts of climate change.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed on December 4, 2015.



_____

Jared Snyder
Assistant Commissioner for Air Resources, Climate Change, and Energy
New York State Department of Environmental Conservation

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF MARTIN SUUBERG

I, Martin Suuberg, declare:

1. I was appointed Commissioner of the Commonwealth of Massachusetts Department of Environmental Protection by Governor Charles D. Baker and Secretary of Energy and Environmental Affairs Matthew A. Beaton on January 8, 2015. Under MASS. GEN. LAWS ch. 21A, § 8, the Department of Environmental Protection is responsible for implementing statutory requirements relating to, but not limited to, environmental health, air pollution control, noise regulation, community sanitation, water supply and water quality, noisome trades and sanitary landfills.

2. I have over thirty years experience in natural resource and environmental law and policy. I have served as Undersecretary for Environmental Affairs in the Executive Office of Energy and Environmental Affairs, and as the Massachusetts Department of Environmental Protection's Deputy Commissioner for Policy and Planning, as well as General Counsel.

3. The purpose of this declaration is to provide my understanding of Massachusetts' readiness to comply with the administrative and procedural requirements of the United States Environmental Protection Agency's ("EPA") final rules regarding greenhouse gas emissions from existing power plants under Section 111(d) of the Clean Air Act (the "Section 111(d) Rule" or "the Rule"). 80 Fed. Reg. 64510 (2015).

Section 111(d) Rule

4. I have reviewed the final Section 111(d) Rule and, based on my initial review of the Rule, Massachusetts as part of the Regional Greenhouse Gas Initiative ("RGGI") is well positioned to meet the goals of the Section 111(d) Rule. The Rule establishes carbon dioxide (CO_2) emission performance rates for reducing emissions at electric generating units. It also specifies guidelines for states to use in developing, submitting, and implementing state plans to achieve the Rule's emission rate goals. The Rule also sets out state rate-based and mass-based CO_2 goals to provide states with flexibility in developing their plans, including utilizing allowance trading programs and other measures.

5. The Section 111(d) Rule requires that states submit compliance plans, or initial submittals requesting an extension, to EPA by September 6, 2016. States that are granted an extension must submit their compliance plans by September 6, 2018. The Section 111(d) Rule also permits states to join together and submit joint compliance plans in lieu of state-specific plans. The compliance period begins January 1, 2022, giving states more than six years from now to prepare to comply. Given the work that Massachusetts has already done as part of RGGI and the state goals established in the 111(d) Rule, Massachusetts expects to comply with the deadlines to submit a compliance plan and meet the state goals.

Regional Greenhouse Gas Initiative

6. RGGI is a market-based program to reduce greenhouse gas emissions from the electric power sector. RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont (together, the "RGGI States").

7. The program requires power plants to possess a tradable CO_2 allowance for each ton of CO_2 they emit. The program was developed under a Memorandum of Understanding signed by initial member state governors in 2005. In 2007, Massachusetts signed onto the RGGI Memorandum of Understanding and adopted the Massachusetts CO_2 Budget Trading Program regulations by 2008. The first RGGI multi-state auction took place in September 2008, and the compliance period began January 1, 2009.

8. Massachusetts' laws and regulations establish a CO_2 Budget Trading Program that limits emissions of CO_2 from electric power plants, creates CO_2 allowances, determines appropriate allowance allocations, and provides for participation in CO_2 allowance auctions. MASS. GEN. LAWS ch. 21A, § 22; 310 MASS CODE REGS. 7.70; and 225 MASS CODE REGS. 13.00.

9. Collectively, the RGGI states' CO_2 Budget Trading Programs establish an annually declining cap on CO_2 emissions from the power sector within the RGGI States. The RGGI program, in conjunction with other state clean energy polices and other energy market factors, has helped Massachusetts reduce carbon dioxide emissions by approximately 40 percent since 2005.

10. The RGGI States completed a two-year comprehensive program review in 2012. Following the review, the states established a new regional CO_2 budget that lowered the cap on emissions to 91 million tons in 2014, a reduction of 45 percent from the original cap. Under the

program changes, the cap will decline 2.5 percent each year from 2015 to 2020. To implement the newly lowered cap, the RGGI States then revised their own CO_2 Budget Trading Programs through their state-specific legislative and regulatory processes.

11. Using their own processes for revising their respective legal authorities, the RGGI States successfully adopted statutory and regulatory changes in time for the lower regional cap to be in place for 2014 regional auctions. In Massachusetts, the Department of Environmental Protection, following the release of proposed draft regulations and a public hearing and comment period, adopted changes to the regulations governing the state's CO_2 Budget Trading Program, 310 MASS. CODE REGS. 7.70, within one year from finalizing the changes to the Model Rule that reflected the program review.

12. Under the final Section 111(d) Rule, states are assigned final emission goals for the year 2030, and states may set their own interim goals between 2022 and 2029. The RGGI States are working together to consider submitting one multi-state compliance plan or individual state plans that rely on RGGI as a compliance mechanism. The RGGI states currently have a plan for completing this multi-state effort in a timeframe that will allow for timely submission of state plans. For example, the RGGI states have scheduled stakeholder meetings within the RGGI region to get input on using RGGI as a compliance mechanism. Massachusetts believes the Massachusetts CO_2 Budget Trading Program, as well as other programs currently in place in Massachusetts (e.g., Energy Efficiency programs and the Renewable Portfolio Standard) will assist Massachusetts in complying with EPA's state goal for Massachusetts under the Section 111(d) Rule.

13. Massachusetts has in place the necessary authorities and administrative procedures to assure timely compliance with federal Clean Air Act rules, including the Section

111(d) Rule. In this regard, Massachusetts has decades of experience complying with other federal Clean Air Act rules that require comprehensive state planning to achieve compliance, including State Implementation Plans to achieve the National Ambient Air Quality Standards ("NAAQS") for criteria air pollutants. *See* 42 U.S.C. §§ 7408, 7410; 40 C.F.R. Part 52 Subpart W (Massachusetts).

14. Massachusetts' has experience in preparing and submitting to EPA State Implementation Plans under the NAAQS Program and other State Plans adopted under 111(d) of the Clean Air Act. Pursuant to sections 111(d) and 129 of the Clean Air Act, Massachusetts submitted the Municipal Waste Combustor (MWC) State Plan to EPA on January 11, 1999 (64 Fed. Reg. 48095 (1999) (publication of EPA's approval of MWC State Plan), and submitted amendments to the MWC State Plan on November 16, 2001 (67 Fed. Reg. 62896 (2002) (publication of EPA's approval of amendment). This experience will help the Commonwealth decide on the requisite measures it must include in the State Plan to comply with the recently adopted Section 111(d) Rule for Power Plants.

15. Based on Massachusetts' experience in complying with federal Clean Air Act rules, I anticipate that Massachusetts will be able to comply with the state planning requirements of the Section 111(d) Rule in a timely fashion.

Executed on this 1st day of December, 2015.



Martin Suuberg
Commissioner

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF J. DAVID THORNTON,
ASSISTANT COMMISSIONER FOR AIR POLICY FOR THE MINNESOTA POLLUTION CONTROL AGENCY

I, J. David Thornton, hereby declare:

1. I am the Assistant Commissioner for Air Policy at the Minnesota Pollution Control Agency (MPCA). I have served in this role for over six years, and have 35 years of experience in air policy with the MPCA.

2. As Assistant Commissioner, I oversee the development and implementation of the MPCA's air policies to ensure that Minnesota's outdoor air is healthy for all to breathe and that Minnesota reduces its contribution to global air pollution. These duties include working on the development and implementation of the MPCA's air policies to reduce Minnesota's contribution to global concentrations of greenhouse gases (GHGs).

3. I also oversee the MPCA's implementation of the Clean Air Act (CAA) in Minnesota. In this capacity, I currently direct the MPCA's efforts to address the U.S. Environmental Protection Agency's (EPA) Clean Power Plan rule under § 111(d) of the CAA, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule" (Clean Power Plan). 80 Fed. Reg. 64662 (October 23, 2015). The MPCA leads Minnesota's efforts to evaluate the Clean Power Plan, engage with stakeholders regarding potential State pathways for implementation of the rule, and to develop and submit a state plan to meet Clean Power Plan compliance obligations.

4. I have personal knowledge and experience with Minnesota's efforts to prepare for and to begin to implement the Clean Power Plan, with Minnesota's state programs to reduce GHG emissions from the power sector, and with Minnesota's State Implementation Plan (SIP) submissions to EPA under the CAA.

5. The purposes of this declaration are to: (i) briefly describe Minnesota's experience to date implementing measures to reduce GHG emissions – particularly those from the power sector – including the progress made and benefits realized, (ii) provide an overview of Minnesota's efforts to evaluate and strengthen the EPA's Clean Power Plan, and (iii) compare compliance planning for the Clean Power Plan with planning efforts in Minnesota to address other federally required regulatory programs, namely the SIP.

MINNESOTA'S GHG PROGRAMS

6. Minnesota has accomplished significant reductions in GHG emissions from the electric utility sector over the past two decades through a number of strategies, involving the state legislature, Minnesota's Department of Commerce, Minnesota's Public Utilities Commission, the MPCA, and Minnesota's electricity producers.

7. In 2007, the Minnesota legislature unanimously adopted a wide-ranging state effort to address GHG emissions in Minnesota, known as the Next Generation Energy Act (NGEA). Minn. Stat. §§ 216H.01-.13. The NGEA established state-level GHG emission reduction targets of 15% from 2005 levels by 2015, 30% from 2005 levels by 2025, and 80% from 2005 levels by 2050. The NGEA also established a GHG emission reporting structure, a comprehensive planning process and limitations on new or imported coal generation for Minnesota customers.

8. Also in 2007, the Minnesota legislature adopted a state Renewable Energy Standard (RES). Minn. Stat. § 216B.1691. The RES phases in from 2010 to 2025 and creates renewable energy requirements for all utilities operating in Minnesota. It will ultimately result in a weighted 27% of all retail electric sales in Minnesota coming from renewable energy sources. Minnesota now has about 2,800 megawatts (MW) of renewable energy installed, and based on Minnesota

utilities' long-range resource plans, is on track to meet the statute's RES requirement by 2025. In addition to the overall RES, in 2013, the Minnesota legislature adopted a Solar Energy Standard for the state's investor-owned utilities requiring that by the end of 2020, at least 1.5% of total retail sales are generated by solar energy. Minn. Stat. § 216B.1691, subd. 2f.

9. Minnesota has administered a demand-side management program called the Minnesota Conservation Improvement Program ("CIP") since 1982. The NGEA expanded and improved the program and established a statewide energy conservation goal of 1.5% of annual retail electric and gas sales. Minn. Stat. § 216B.241. A 2013 report to the Minnesota legislature compares the cost of the CIP to the cost of electric generation by a variety of technologies: http://archive.leg.state.mn.us/docs/2013/mandated/131112.pdf. The report demonstrates the CIP and demand side management efforts generally have proven to be very efficient, and low cost. The Minnesota Department of Commerce manages the CIP to ensure effective implementation of the program. I believe Minnesota will continue investing in this program because the statutory requirement has proven to be a cost-effective way to reduce the growth in demand for electricity in Minnesota.

10. In 2001, the Minnesota legislature enacted an emissions reduction statute that allowed special recovery rate consideration for air pollution control

projects, with the goal to reduce emissions from Minnesota's aging coal-fired utility boilers. Minn. Stat. § 216B.1692. As a result, beginning in 2007 and finishing in 2009, Xcel Energy, the state's largest electric utility, completed a project called the "Metro Emissions Reduction Project." The project repowered a 520 MW coal-fired power plant, lowering its heat rate by 5%, and retired 642 MW of coal-fired power and replaced it with 956 MW of intermediate load natural gas combined cycle generation. The repowering from coal to gas generation is not only a significant contribution to Minnesota's GHG emission reduction efforts, it also provides backup capacity to support Minnesota's wind generation.

11. In 2008, the MPCA began to biennially track Minnesota's progress in meeting GHG emission reduction targets. Based upon this progress tracking, the most recent of which is included in the MPCA's January 2015 Greenhouse Gas Emissions Reduction biennial report to the Minnesota legislature, I have personal knowledge and experience that the Minnesota programs described above have resulted in significant emission reductions of GHG – specifically carbon dioxide (CO_2) – from our power sector while still supporting a robust economy:

a. Between 2005 and 2012, GHG emissions from the electric utility sector, the largest single sector source of GHG emissions in Minnesota, declined 17%. The MPCA estimates that if emissions reductions efforts in the

electric power sector continue at present levels through 2025, Minnesota could expect a 33% reduction in expected electric power sector GHG emissions.

b. During this period of GHG emissions reductions, the gross state product of Minnesota has increased, surpassing pre-recession (2009) levels by 2010 and continuing to grow through at least 2012.

12. The MPCA is a member of the Minnesota Environmental Quality Board ("EQB") and contributed to EQB's 2015 "Minnesota and Climate Change: Our Tomorrow Starts Today" report, which noted that renewable energy accounts for nearly 20% of Minnesota's annual electric generation, with nearly 16% of Minnesota's power coming from wind generation in 2013, making Minnesota fifth in wind generation nationwide, while Minnesota's residential electricity rates are frequently below the national average.

13. The EQB report notes that more than 15,300 Minnesotans work in the clean energy field, and these workers added more than $1 billion in direct wages to the Minnesota economy in 2013. These clean energy jobs in Minnesota grew more than 75% between 2000 and 2014, while the total Minnesota economy grew 11% during the same time period.

14. Minnesota's electric producers incorporate NGEA and other statutory clean energy requirements into their required energy planning through an Integrated Resource Plan (IRP) process. Minnesota's Public Utilities Commission,

with review from the Minnesota Department of Commerce and assistance from the MPCA, approve utilities' IRPs and ensures they provide reliable and affordable electricity for all Minnesotans while complying with state and federal environmental and clean energy regulations.

15. In short, Minnesota has achieved significant GHG emissions reductions since 2007 while growing its economy, and has built a clean energy economy over the past decade that will support continued GHG emissions reductions well into the future.

16. In addition to supporting state efforts to reduce climate change-causing GHG emissions, the strategies relied upon to reduce GHG emissions have also contributed to significant reductions in "conventional" air pollutants from the same power plant sources. For example, between 2002 and 2012 utility emissions of nitrogen oxides (NO_X) and sulfur dioxide (SO_2) in Minnesota decreased 67% and 74%, respectively.

17. Power plants also saw significant reductions in air toxics. According to MPCA's 2015 "Air Quality in Minnesota" report to the Minnesota legislature, power plants saw a nearly 19% reduction in mercury emissions between 2007 and 2011.

18. Minnesota's "Life and Breath" report, a 2015 publication jointly authored by MPCA and the Minnesota Department of Health, notes that a 10%

reduction in concentrations of fine particles (formed, in part, from emissions of SO_2 and NO_X) and ground-level ozone (created by chemical reactions between NO_X and VOC) can prevent hundreds of deaths, hospitalizations and emergency department visits due to heart and lung conditions each year.

CLEAN POWER PLAN REVIEW AND ANALYSIS

19. I have led the MPCA's efforts to analyze and inform the development of the proposed and final Clean Power Plan since at least 2013. The MPCA provided pre-proposal comments to EPA with recommendations for a potential existing source performance standard that included compliance flexibility for states and regional cooperation. Our comments also recommended that EPA include a mix of policies and programs as the "best system of emission reductions" (BSER) and noted that Minnesota had shown that such a mix of policies – including generating source improvements, renewable energy development and demand side management – can achieve important GHG emissions reductions without affecting reliability, while supporting a healthy economy.

20. I worked with representatives of the Midwestern Power Sector Collaborative (MPSC), a diverse group of regional stakeholders including electric power providers, environmental organizations and state regulators, to submit joint pre-proposal comments on existing source performance standards for the electric

sector that also reflected requests such as state flexibility and opportunities for multi-state collaboration.

21. Both the State of Minnesota (the MPCA working jointly with the Minnesota Department of Commerce) and the MPSC submitted comments on EPA's proposed Clean Power Plan in 2014 suggesting improvements to the proposal. 79 Fed. Reg. 34830 (June 18, 2014). The EPA's final Clean Power Plan reflects many of these submitted comments, including requests for better facilitation of multi-state compliance approaches, refinement of the interim targets to avoid "compliance cliffs," and better equivalency of rate and mass-based targets.

22. I, along with my staff, have reviewed the Clean Power Plan and supporting documents and have discussed that rule with other state agencies, the MPSC, the Midcontinent States Energy and Environmental Regulators (MSEER) group, EPA, and stakeholders from across the state and nation. I believe EPA's Clean Power Plan is reasonable and its targets achievable. It incorporates several recommendations from Minnesota and others to ensure a program that is appropriately stringent, while providing helpful flexibility.

23. EPA's calculation of BSER and final rule pathways for compliance reflect many strategies that Minnesota has demonstrated are successful. As indicated previously, the MPCA estimates that if emissions reduction efforts in the electric power sector continue at present levels for the next decade (i.e., if our

"business as usual" policies continue to produce consistent levels of emissions reductions), Minnesota can expect a 33% reduction (from 2005 levels) in electric power sector GHG emissions by 2025. An analysis of the Clean Power Plan's mass-based emission target for Minnesota, adjusted for the outage of our largest affected power plant in 2012, shows that the rule requires an approximately 34% GHG emission reduction from 2012 levels. While Minnesota must make some further reductions to achieve its target, Minnesota's early reduction efforts position the state well to achieve the reductions required under the Clean Power Plan.

24. The flexibility provided by the Clean Power Plan ensures that Minnesota can achieve its required emissions standard without significant change to existing energy plans for the future. While EPA's assembly of "building blocks" in its Clean Power Plan would suggest a certain energy profile for Minnesota, we expect to meet targets by relying on a different compliance structure than that suggested by the building blocks, namely, by relying more on the development of renewable energy resources, and on energy efficiency measures, and less on a shift from coal to gas generation. It is clear in the Clean Power Plan that EPA's building block assembly was used to calculate reasonable targets, and not to establish binding compliance pathways for states.

25. The trading and multi-state compliance options afforded by the Clean Power Plan provide further flexibility, and allow states to consider the regional nature of electricity generation in their compliance planning.

26. Section 111 of the CAA requires that EPA provide states the opportunity to submit plans that establish equivalent programs for the emission guidelines that apply to existing sources under Section 111(d). States have considerable flexibility in determining the nature of compliance planning, as long as the state demonstrates equivalency with the federal emission guidelines.

27. The planning period provided by EPA in the Clean Power Plan is sufficient to allow for effective energy planning, particularly in light of the proposed model trading rule language, which EPA expects to finalize in summer 2016. While state plans may be due as early as September 6, 2016, requests for a two-year extension are available for states with minimal requirements. States are therefore afforded as much as a three-year planning window to develop and submit state plans demonstrating equivalency with the federal emissions guidelines. This planning window is comparable to that provided by the CAA for many SIPs that address National Ambient Air Quality Standards (NAAQS). Some of these SIPs can require extensive levels of control across a far broader range of sources than the electric power sector, as well as significant amounts of modeling and other technical support.

28. While states have work ahead of them to produce final plans for Clean Power Plan compliance, the planning window is comparable to other CAA state planning programs. The MPCA will submit a request for extension by the September 6, 2016, deadline. EPA provided guidance on the minimum requirements for a state to request an extension and the MPCA is committed to following the guidance. To support an extension request, the MPCA will continue its extensive stakeholder input process, will deploy its Environmental Justice outreach plan, and will continue discussions regarding the appropriate compliance approach to take and whether to participate in the Clean Energy Incentive Program.

29. The compliance timelines required by the Clean Power Plan are reasonable and achievable. The Clean Power Plan provides approximately 15 years between rule finalization and the final 2030 compliance target. Minnesota finalized its NGEA in 2007, and between 2005 and 2012, saw a 17% reduction in GHG emissions from the electric power sector. The MPCA expects to see an additional commensurate level reduction over the next decade.

30. The Clean Power Plan also establishes less stringent interim emissions standards, which states must achieve on average over an eight-year period between 2022 and 2029 (the interim period begins nearly seven years after rule finalization). The Clean Power Plan also affords states the opportunity to determine the pace of reductions in this interim period, as long as the average

standard is achieved. With the extensive lead time, the emissions reductions required by the Clean Power Plan are realistic and achievable, as Minnesota has demonstrated with its BSER.

ADDITIONAL EXPERIENCE WITH STATE PLANNING FOR FEDERAL REGULATIONS

31. Minnesota has experience with the state/federal cooperative model in its air quality planning efforts, in particular, its SIP/NAAQS planning whereby Minnesota uses its SIPs to ensure that it achieves compliance with the NAAQS (federal target). Minnesota has a successful SIP program; there are currently no areas EPA has determined to be in violation of any NAAQS.

32. The CAA provides SIP development deadlines of up to three years to address various NAAQS changes, and from three to six years after an area is initially designated nonattainment, or five to eight years after a new standard is finalized. By contrast, the Clean Power Plan provides a generous 15 years between finalization of the standards and final compliance.

33. Minnesota has experience with complex, multi-state planning efforts across lengthy planning periods. For example, the regional haze SIPs required by the Regional Haze Rule and Section 169 of the CAA are intended to address a ten-year planning period, and involve considerable multi-state (and multi-agency) coordination and planning. Minnesota's initial Regional Haze SIP was largely

approved by the EPA in 2012, and visibility conditions in our two Class I areas have improved beyond what was expected by the SIP.

34. Minnesota also has experience in state planning for Section 111(d) requirements. On April 28, 1998, the MPCA submitted its "Section 111(d) Plan for Implementing the Large Municipal Waste Combustor Emission Guidelines." Minnesota's plan addressed emission guidelines finalized by EPA on December 19, 1995 (60 Fed. Reg. 65382) and amended on August 25, 1997. EPA approved Minnesota's plan, effective October 13, 1998 (63 Fed. Reg. 43080).

35. Minnesota's experience with the state/federal cooperative model across a wide range of CAA programs supports our ability to effectively plan for and comply with EPA's Clean Power Plan.

HARMS TO MINNESOTA

36. Minnesota has already begun to see the harmful effects of climate change. The temperature in the state has increased 1°F to 2°F since the 1980s. Since 2004, Minnesota has experienced three 1,000-year floods and an increase in intense weather events including hailstorms, tornadoes and droughts. In 2007, we saw several counties in the state receive drought designation, while others were declared flood disasters – an occurrence that repeated itself in 2012 when 11 counties declared flood emergencies while 55 received drought designations.

37. Climate change has caused financial impacts to Minnesota as well. In 2013, Minnesota had some of the highest weather-related disaster claims in the nation. Since 1997, 32 severe weather natural disasters have cost Minnesota nearly $500 million in natural disaster recovery assistance to affected jurisdictions alone.

38. The impacts of climate change are expected to worsen in Minnesota, affecting our economy, our ecosystems and the health of all Minnesotans. For these reasons, Minnesota has been proactive in its efforts to address GHG emissions, and has urged EPA to require action nationwide.

39. A stay of the Clean Power Plan implementation will result in a delay in actions to reduce GHG emissions and a delay in real progress to reduce the harmful impacts of climate change, in Minnesota and elsewhere.

40. A stay would also create uncertainty and confusion for state planning efforts, affecting Minnesota's ability to coordinate state, regional and federal energy planning efforts. Changes in the electric utility industry require long planning horizons and lengthy lead times for infrastructure development. A stay would introduce uncertainty in these planning horizons and hamper the ability of utilities and regulators to make orderly, timely, and cost effective decisions. Any such intrusion into the effective planning will serve to increase

implementation costs and market uncertainty, and decrease efficiency for Minnesota, and likely all states.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 12/4/2015.

J. David Thornton
Assistant Commissioner for Air Policy
Minnesota Pollution Control Agency

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF CRAIG A. WRIGHT, DIRECTOR OF AIR RESOURCES DIVISION, NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

I, Craig A. Wright, declare:

1. I have been employed at the New Hampshire Department of Environmental Services ("DES") in the field of air pollution control since January 1988. Since September 2013, I have served as the Director of the Air Resources Division ("Air Director") at DES. My educational background consists of a B.S. in Chemical Engineering from the University of New Hampshire.

2. During my career at DES, I have become very familiar with the federal Clean Air Act and its regulation of stationary sources of air pollution, including Sections 111(b) and 111(d). My specific job assignments at DES have

included working as a Permit Engineer, Permit Bureau Administrator, Environmental Programs Manager (Deputy Director) and currently serving as the Air Director. I have been directly involved in the planning, development and implementation of state plans under the Clean Air Act, including state implementation plans under Section 110 to comply with the National Ambient Air Quality Standards and also Section 111(d) State Plans for other source categories, including Municipal Waste Combustors (MWCs), Commercial/Industrial Solid Waste Incinerators (CISWI) and Hospital/Medical/Infectious Waste Incinerators (HMIWI).

3. In my current capacity as DES Air Director, I am responsible for the oversight and implementation of federal Clean Air Act programs on behalf of the State of New Hampshire. In addition, I have been directly involved in the state's activities as part of the Regional Greenhouse Gas Initiative ("RGGI"), including the 2012 "program review" of RGGI that resulted in a number of policy changes to the program. DES is ultimately responsible for the day-to-day mechanics of implementing the RGGI Program in New Hampshire, including interactions with RGGI, Inc. For example, I oversee and manage the DES program staff that participates in RGGI Program Committees conference calls and work sessions. I, on occasion, serve on behalf of the DES Commissioner as an "alternate director" on the RGGI Executive Committee. I also routinely consult with DES

Commissioner Thomas S. Burack and Public Utilities Commission ("PUC") Commissioner Robert R. Scott, both members of the RGGI Board of Directors, on RGGI program and policy matters.

4. Ultimately, DES will be responsible for development and implementation of a State Plan to comply with the United States Environmental Protection Agency's ("EPA") final rules regarding greenhouse gas emissions from existing power plants under Section 111(d) of the Clean Air Act (the "Section 111(d) Rule"), otherwise known as the Clean Power Plan.

5. The purpose of this declaration is to provide my understanding of New Hampshire's and the RGGI states' readiness to comply with the administrative and procedural requirements of the Section 111(d) Rule.

Addressing Climate Change Pollution in New Hampshire

6. New Hampshire residents are already experiencing the effects of a changing climate on our environment: more intense rainstorms that wash out roads and culverts, and that damage homes, businesses, and wastewater and drinking water facilities; and gradual warming that supports larger tick populations that infect people and wildlife with disease and that negatively affects our cold-weather industries and maple-syrup producers. In addition to adapting to a changing climate we must also take concrete steps to reduce carbon emissions from all

sectors, including the electric utility sector which represents about one-third of carbon dioxide emissions in the United States, according to EPA.

7. To address the causes and impacts of climate change, former NH Governor John Lynch created the Climate Change Policy Task Force in December 2007. The Task Force was chaired by DES Commissioner Burack and composed of 29 members, who represented a variety of geographic regions as well as interests, and possessed a significant amount of experience in energy, climate and policy issues. The Task Force oversaw the development of the 2009 NH Climate Action Plan, which expresses a vision for the state's energy, environmental, and economic development future and includes recommendations for maximizing energy efficiency, increasing use of renewable fuels, protecting natural resources, and adapting to existing impacts of our changing climate. The plan recommendations were selected to support the goal of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050 while providing significant economic opportunities across the state.

8. More recently, Governor Margaret Wood Hassan announced that New Hampshire would sign onto the Under 2 MOU, a global compact among cities, states, and provinces worldwide to limit the increase in global average temperature to below two degrees Celsius.

Section 111(d) Rule

9. I have closely followed the development of the Clean Power Plan since its original proposal in June of 2014. Since that time, my direct involvement includes reading significant portions of both the proposed and final rules, as well as reading EPA guidance materials and technical support documents. In addition, I have participated in numerous conference calls with EPA, the RGGI States, Environmental Council of the States, and the Georgetown Climate Center on various aspects of both the draft and final versions of the Clean Power Plan. I have participated directly in the drafting and filing of comments on the proposed rule by DES, RGGI, and the Georgetown Climate Center. These efforts included participating in conference calls, providing comments on draft language and consulting with DES leadership and the Governor's Office on various aspects of the Clean Power Plan. Finally, I have attended and participated in several meetings with other RGGI states' staffs to discuss various aspects of the Clean Power Plan and its implementation.

10. I have reviewed the final Section 111(d) Rule. The rule establishes carbon dioxide (CO_2) emission performance rates for reducing emissions at electric generating units. It also specifies guidelines for states to use in developing, submitting, and implementing state plans to achieve the rule's emission rate goals.

In the final rule, EPA promulgated subcategory-specific CO_2 emission performance rates that reflect the "best system of emissions reductions… adequately demonstrated" (BSER) from the power sector. The final rule also sets out state rate-based and mass-based CO_2 goals to provide states with flexibility in developing their plans, including utilizing allowance trading programs and other measures. New Hampshire's rate-based goal for 2030 is 858 pounds-CO_2 per megawatt-hour by 2030, and its mass-based goal for 2030 is about 4 million short tons of CO_2 per year, which is about 14% below 2012 power sector emissions.

11. The Section 111(d) Rule requires that states submit compliance plans or initial submittals requesting an extension to EPA by September 6, 2016. States that are granted an extension must submit their compliance plans by September 6, 2018. The Section 111(d) Rule also permits states to join together and submit joint compliance plans in lieu of state-specific plans. The compliance period begins January 1, 2022, giving states seven years from now to prepare to comply. The Section 111(d) Rule also provides for considerable flexibility in the setting of states' interim goals, including the opportunity to achieve the final 2030 goals at a pace that each state finds appropriate.

Regional Greenhouse Gas Initiative

12. The Regional Greenhouse Gas Initiative ("RGGI") is a market-based program to reduce greenhouse gas emissions from the electric power sector. RGGI

is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont (together, the "RGGI States").

13. The program requires power plants to possess a tradable CO_2 allowance for each ton of CO_2 they emit. The program was developed under a Memorandum of Understanding signed by initial member state governors in December 2005, followed by issuance of a model rule in August 2006. All states completed their legislative and regulatory processes by the end of 2008, allowing for implementation by the RGGI States in 2009.

14. In New Hampshire, former Governor Lynch signed the RGGI Memorandum of Understanding on December 20, 2005. RGGI authorization legislation (HB 1434) was introduced on January 2, 2008, approved by the NH General Court on June 5, 2008 and signed into law by Governor Lynch on June 11, 2008. DES initiated the formal rulemaking process on August 21, 2008 and adopted interim regulations implementing RGGI on October 1, 2008 and final regulations on April 3, 2009. In all, approximately 16 months elapsed from the time the legislation to adopt RGGI was proposed until the law was enacted and the implementing regulations were adopted.

15. RGGI is grounded in each state's own statutory and regulatory authorities. Each state's laws and regulations establish "CO_2 Budget Trading

Programs" that limit emissions of CO_2 from electric power plants, create CO_2 allowances, determine appropriate allowance allocations, and provide for participation in CO_2 allowance auctions. In New Hampshire, RGGI is grounded in statute and regulations. N.H. REV. STAT. ANN. § 125-O:20-29; N.H. CODE ADMIN. R. ENV-A 4600, 4700, 4800.

16. Under contracts with the RGGI States, RGGI, Inc., a non-profit corporation, administers regional auctions to sell CO2 allowances. States sell nearly all emission allowances through auctions and invest most of the proceeds—over $2 billion through March 2015—in energy efficiency, renewable energy, and other consumer benefit programs. See Press Release, CO2 Allowances Sold for $6.02 in 29th RGGI Auction; Total Proceeds for Reinvestment Now Exceed $2 Billion, September 11, 2015, at http://www.rggi.org/docs/Auctions/29/PR091115_Auction29.pdf

17. Collectively, the states' CO_2 Budget Trading Programs establish an annually declining cap on CO_2 emissions from the power sector within the RGGI States. The RGGI program, in conjunction other state clean energy polices and other energy market factors, has helped the RGGI States reduce carbon dioxide emissions by approximately 40 percent since 2005.

2012 Program Review

18. The RGGI States completed a two-year comprehensive program review in 2012. Following the review, the states established a new regional CO_2 budget that lowered the cap on emissions to 91 million tons in 2014, a reduction of 45 percent from the original cap. Under the program changes, the cap will decline 2.5 percent each year from 2015 to 2020. To implement the newly lowered cap, the RGGI States then revised their own CO_2 Budget Trading Programs through their state-specific legislative and regulatory processes.

19. New Hampshire and the RGGI States successfully adopted statutory and regulatory changes in time for the lower regional cap to be in place for 2014 regional auctions. In New Hampshire, RGGI revision legislation was introduced as a non-germane amendment to existing House Bill 306 on February 26, 2013 and passed the NH House on March 20, 2013. The NH Senate passed the bill with amendments on May 23, 2013. The NH House subsequently concurred with the Senate amendments on June 5, 2013 and the bill was signed into law by Governor Hassan on July 15, 2013. The revised statutory changes authorized the lowering of the state share of the regional cap, adoption of a revised price protection mechanism, and additional offsets categories. DES subsequently initiated the formal rulemaking process on September 9, 2013 and received final approval from the Joint Legislature Committee on Administrative Rules (JLCAR) on November

22, 2013 with a rule effective date of January 1, 2014. *See* N.H. REV. STATS. ANN. §§ 125-O:20-29; N.H. CODE ADMIN. R. ENV-A 4600, 4700, 4800.

20. As when RGGI was adopted, New Hampshire successfully implemented the 2012 Program Review changes, despite the irregular calendar (generally only in session from January through June in any given calendar year) of the New Hampshire legislature.

21. The RGGI States' successful 2012 program review demonstrated their ability to work together to set new goals for regional emissions reductions while timely amending their individual state programs to reflect those goals. *See* Press Release, RGGI States Make Major Cuts to Greenhouse Gas Emissions from Power Plants, Jan. 13, 2014, *at* http://www.rggi.org/docs/PressReleases/PR011314_AuctionNotice23.pdf.

RGGI States and the Section 111(d) Rule

22. In their comment letters on the proposed Section 111(d) Rule, the RGGI States offered their support of the rule's framework, which provides states with flexibility to craft plans to meet state-specific emissions targets. The RGGI States also lauded the provisions of the proposed rule encouraging states to work together to develop multi-state compliance plans. *See* RGGI States' Comments on Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (November 5, 2014); RGGI States' Supplemental

Comments on Proposed Clean Power Plan (Dec. 12, 2014); *see also* NH State Comments on Proposed Clean Power Plan (Dec. 1, 2014).

23. Under the final Section 111(d) Rule, states will be required to demonstrate compliance by January 1, 2022, and states may set their own interim goals between 2022 and 2029. The RGGI States are working together to consider submitting one multi-state compliance plan or individual state plans that rely on RGGI as a compliance mechanism. The RGGI States currently have a plan for completing this multi-state effort in a timeframe that will allow for timely submission of state plans.

24. For example, DES has already held a stakeholder meeting on November 20, 2015 to gather public input on implementation of the Clean Power Plan. As part of the outreach process, DES provided public notice of the stakeholder meeting via a newspaper of statewide circulation and the DES and RGGI, Inc. websites. In addition, DES provided direct notification to affected power plants, towns where power plants are located, selected additional towns that have vulnerable, low income or minority communities (per the environmental justice requirements of the Clean Power Plan), sister governmental agencies, state legislators and other potentially interested parties. In addition, DES also participated in a regional RGGI stakeholder meeting on November 17, 2015 hosted by RGGI, Inc. DES and RGGI, Inc. have provided stakeholders with materials via

the RGGI, Inc. website on key items for discussion including: State Plan Approaches, Post 2020 CO_2 Emissions Reductions, RGGI Flexibility Mechanisms, RGGI Regulated Sources, Promoting Renewable Energy and Energy Efficiency, and Broadening the RGGI Market/Trading Partners. See http://www.rggi.org/docs/ProgramReview/2016/11-17-15/Key_Discussion_Items_11_17_15.pdf. Finally, DES has provided briefings on the final Clean Power Plan to a number of interested parties including environmental interest groups, professional engineering organizations, legislative oversight committees, biomass interests, and the NH Congressional Delegation. The RGGI states plan to hold at least two other stakeholder meetings to ensure that at least one meeting will be held in each of the regional transmission organizations (ISO-NE, NYISO and PJM) located within the RGGI States.

25. The RGGI State environmental agencies, including DES, have in place the necessary authorities and administrative procedures to assure timely compliance with federal Clean Air Act rules, including the Section 111(d) Rule. In this regard, each of the RGGI States has decades of experience complying with other federal Clean Air Act rules that require comprehensive state planning to achieve compliance, including state implementation plans to achieve the National Ambient Air Quality Standards for criteria air pollutants. *See* 40 C.F.R. Part 52, Subpart EE (New Hampshire).

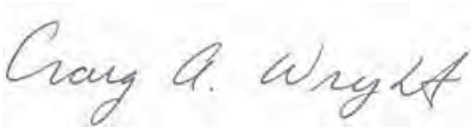
26. New Hampshire has a demonstrated history of successfully adopting a program to regulate and reduce carbon dioxide pollution from the electric generating sector and subsequently amending the program. As noted above, New Hampshire successfully implemented the RGGI program in 2008 and significant program amendments in 2013. Both of these events required both legislative approval and a formal administrative rules adoption process. As noted above, the NH Legislature is only in session for approximately six months (typically January through June) per calendar year and with very limited bill filing windows. Despite these limiting factors, New Hampshire has in the past been successful in adopting policies (in the form of statutes and implementing regulations) consistent with or similar to the Clean Power Plan.

27. Based on the New Hampshire's experience complying with federal Clean Air Act rules and New Hampshire's and the RGGI States' successful implementation of the RGGI program, I am confident that New Hampshire and the RGGI States are well equipped and will be able to comply with the state planning requirements of the Section 111(d) Rule in a timely fashion. I believe that under the Clean Power Plan, EPA has provided states with sufficient time to adopt a compliant and approvable state plan.

28. New Hampshire, working with the other RGGI States will likely file an initial submittal with a request for extension by September 6, 2016, as provided

for in the Clean Power Plan. I believe that New Hampshire will be well positioned to obtain an extension from EPA as we are actively working on evaluating state plan options with respect to a multi-state approach, undertaking a significant public outreach effort including consideration of environmental justice communities, and planning to utilize the additional time to complete necessary plan components, including revised legislation and administrative rules, as needed. As a final note, I anticipate that New Hampshire will be able to comply with the Clean Power Plan by submitting an approvable final plan to EPA by September 6, 2018.

Executed on this 1st day of December 1, 2015.



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Craig A. Wright, Director

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF JASON EISDORFER, UTILITY PROGRAM DIRECTOR, OREGON PUBLIC UTILITY COMMISSION

I, Jason Eisdorfer, hereby declare:

1. I make this declaration from my personal and professional knowledge. I would testify to the following facts if called as a witness at trial.

2. I am the Utility Program Director at the Oregon Public Utility Commission. I oversee a staff of approximately 77 employees who advise the Oregon Public Utility Commission how to regulate electric, natural gas, telephone and water companies. Previously I was the Greenhouse Gas Policy Strategist for the Bonneville Power Administration, serving as the senior advisor on policies and programs related to greenhouse gas issues. I served as legal counsel and energy program director of the Citizens' Utility Board of Oregon for 13 years. I co-

authored legislation related to climate change and to electric utility restructuring and operations, including the Oregon Renewable Energy Act and the Climate Change Integration Act.

State Efforts to Combat Climate Change

3. Oregon has been concerned about the negative impacts of climate change for almost three decades and has been working on strategies to reduce and mitigate those impacts for nearly as long, beginning with the Governor's creation of the Oregon Task Force on Global Warming in 1988.

4. Many of Oregon's efforts to reduce greenhouse gas emissions have focused on the power sector. Oregon has imposed carbon dioxide emission limits on new gas-fired power plants since 1997. ORS 469.503(2). The requirement is implemented by the Oregon Energy Facility Siting Council ("Siting Council") and requires new power plants to either meet the requirement or purchase greenhouse gas offsets from The Climate Trust, a non-profit entity that has qualified to provide offsets under Siting Council rules.

5. In 2009, the Oregon Legislature prohibited cost recovery in retail rates for any new power plant located in Oregon if its greenhouse gas emissions would exceed that of a modern natural gas-fired power plant. Oregon Laws 2009, ch. 751 (codified as ORS 757.528 to 757.538). In 2013, the Oregon Legislature clarified

that the same prohibition applies to any new out of state power plant serving Oregon load. Oregon Laws 2013, ch. 172. The law also applies to new long-term financial commitments for existing generating facilities in Oregon or serving Oregon. Finally, it requires the Oregon Public Utility Commission (PUC) to report biennially on the estimated rate impacts of Oregon's regulated electric and natural gas utilities achieving two greenhouse gas emission reduction targets.

6. The Oregon Renewable Portfolio Standard, a state statute, requires Oregon's largest utilities to deliver 25 percent of their electricity from renewable resources by 2025. More information on the Renewable Portfolio Standard can be found at: http://www.oregon.gov/energy/RENEW/Pages/RPS_home.aspx. The standards are being phased in for Oregon's investor owned utilities. Each year since the standards became effective in 2010, utilities have met their compliance requirement to provide 5% of their electricity from renewable resources and they are on track to meet the 15% standard in 2015.

7. Oregon's power sector has met the emissions limits and renewable requirements in part by promoting energy efficiency. In 1999, Oregon authorized an independent nonprofit organization to deliver cost effective energy efficiency and market transformation funded through a public purpose charge collected from ratepayers of electric investor owned utilities. ORS 757.612. This nonprofit

organization was later named Energy Trust of Oregon ("the Energy Trust") and began acquiring energy efficiency savings in 2002. From 2002-2014, the Energy Trust acquired 4,310 GWh (492aMW) of electric savings at a levelized cost of 2.34 c/kWh, which is 29 percent of what it would have otherwise cost the utilities to supply an equivalent amount of delivered electricity. Using an Oregon average marginal CO2 emissions avoidance rate of 0.95 pounds per kWh, as calculated by the Energy Trust, this has resulted in the avoidance of approximately 4 billion pounds of CO2 emissions. This represents energy savings equivalent to building a 500 MW power plant or enough energy to power more than 470,700 Oregon homes. The more than half a million customers who realized these savings by participating in Energy Trust programs have already saved $1.9 billion on their utility bills, and over time, these savings will grow to reach $4.8 billion.

8. Today, identification of all cost effective energy efficiency continues through cooperative planning between the utilities and the Energy Trust. As a result of the utilities' bi-annual integrated resource planning, energy efficiency programs have become a significant portion of the lowest cost and least risk utility services provided in integrated resource plans. For example, the 2013 Integrated Resource Plan for Portland General Electric, one of Oregon's largest electric utilities, called for no new major supply resources within the next 10 years, instead selecting increased energy efficiency to meet short and long term energy needs.

EPA Listened to Public Comments and Improved the Final Rule

9. On October 16 and November 25, 2014, Oregon filed with EPA detailed comments on the proposed Clean Power Plan rules. Copies are available at: http://www.deq.state.or.us/aq/climate/co2standard.htm.

10. The Clean Power Plan provides state regulators with a significant degree of flexibility in determining how to comply and has accommodated states that are differently situated. In Oregon, we are currently exploring that degree of flexibility to decide whether to use a rate-based system or a mass-based system in our state plan, whether to apply for early action credits, and whether to "go it alone" or participate in multi-state allowance markets. To that end, we have already begun discussing preferred approaches with states from which our utilities import power. The Clean Power Plan is accommodating of a variety of state compliance approaches, allowing states to leverage existing state laws and recognizing, under particular approaches, the historic investments ratepayers have made in renewable energy and energy efficiency.

11. The final rule also better accommodates provisions in state plans to address electricity reliability concerns. EPA changed the compliance period to begin in 2022, rather than 2020, and added mechanisms for states to seek revision of compliance plans in case of reliability concerns, along with adding a reliability

safety valve—allowing a state to seek revision to its plan or re-submit a new plan in case of unanticipated reliability challenges.

Oregon's Efforts to Implement the CPP Have Begun

12. Oregon is not part of any regional greenhouse gas reduction regulatory program. The reduction policies and investments we have made, partly described in paragraphs 3 through 8, above, have put Oregon, its utilities, and their customers in a strong position to successfully implement and comply with the Clean Power Plan.

13. Oregon's clean energy analytic and regulatory efforts described above provide a strong foundation for us and other states to develop implementation plans for the Clean Power Plan. The Clean Power Plan is a complement to the many actions Oregon has taken over the past few decades to reduce emissions, and will assist Oregon in providing a long-term signal to the power sector for continued emission reductions going forward.

14. Three Oregon State agencies, the Department of Environmental Quality (DEQ), Department of Energy (Energy Department), and the Public Utility Commission (PUC), along with nearly two dozen major stakeholders, have begun working together to develop Oregon's implementation plan. DEQ, the Energy Department and the PUC already have met with representatives from Oregon's

largest private power utilities, independent power producers, environmental organizations, consumer and business groups, and consumer-owned utilities to begin determining the best compliance pathway for Oregon. These agencies also held an initial, open stakeholder meeting on October 27, 2015, which was attended by more than 40 persons representing power companies, environmental organizations, ratepayer organizations, industrial electricity customers, and a federal power marketing agency. The group engaged in robust conversations regarding stakeholder input received to date, criteria for evaluating compliance options, conceptual compliance scenarios, and the proposed process that will be used to develop Oregon's plan.

15. DEQ, the Energy Department, and the PUC are working together to develop specialized modeling and analysis of compliance options, including regional and national compliance approaches. The agencies also have begun developing criteria to assess the best compliance plan for Oregon. Possible factors for that consideration include cost and risk to Oregon utility ratepayers, effect on CO2 emissions, cost to energy suppliers, effect on reliability of the electricity system, administration requirements, and connections and compatibility with other Oregon policies.

16. DEQ, the Energy Department, and the PUC have developed a planning timeline and schedule to meet the planning deadlines in the Clean Power

Plan and fully anticipate making an initial submission to EPA by September 6, 2016.

17. Oregon's electric utility planning process requires utilities to demonstrate that they are providing the least-cost and least-rick portfolio of resources to their customers. Included in the analysis of cost and risk is assessment of compliance with current and likely future environmental regulations. In these plans, submitted every two years, utilities conduct sophisticated analyses of the least-cost and least-risk portfolio of resources and planning for compliance with federal and state regulation. For example, the PUC requires the utilities to explore a range of potential future prices on carbon as a surrogate for a number of different potential carbon regulation designs. The results of these scenario and sensitivity runs help inform the utilities, utility stakeholders, and the regulators what kinds of investments provide the least cost and least risk portfolio of resources depending on the stringency of future carbon regulation. The portfolio of resources could include fossil-fuel generation, renewable generation, energy efficiency or demand response.

18. This is a familiar process that has been followed in Oregon for many years. For example, in 2010, the Public Utility Commission approved Portland General Electric's plan to close its Boardman power plant by the end of 2020 in response to regional haze and mercury emissions standards implemented by the

Oregon Department of Environmental Quality. The PUC concluded that closure of the plant in 2020, rather than approving costly pollution control upgrades, was the least cost, least risk option to meet Portland General Electric's customer demands and maintain reliability. The PUC therefore approved and incorporated the closure into the utility's 20-year integrated resource plan.

19. Oregon utilities have already begun factoring the specific requirements of the Clean Power Plan into that process, which will make the CPP an integral, streamlined part of utilities' planning by the time compliance decisions will begin to be made.

20. Indeed, the Clean Power Plan allows states significant time and flexibility in developing a compliance plan. The EPA has said that states can receive an extension up to 2018 for submitting their final plan, if necessary. They have also outlined flexible submission options that will allow states to accommodate their own planning processes and the needs of their stakeholders. There are seven years between the finalization of the Clean Power Plan and when the compliance period begins, allowing Oregon agencies and regulated parties ample time to develop a plan that works for Oregon and to begin putting in place the measures necessary to comply. For these reasons, and others articulated above, I believe that implementation of the Clean Power Plan will be relatively

straightforward and entirely manageable for Oregon and other states that choose to submit their own plans to EPA.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 3, 2015.

Jason Eisdorfer
Utility Program Director, Oregon Public Utility Commission

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF NEIL MILLAR, EXECUTIVE DIRECTOR INFRASTRUCTURE DEVELOPMENT AT THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I, Neil Millar, declare as follows:

1. My name is Neil Millar. I am employed by the California Independent System Operator Corporation (California ISO) as the Executive Director, Infrastructure Development. My business address is 250 Outcropping Way, Folsom, California 95630. I make this declaration based on my own personal knowledge and if called as a witness could and would testify competently thereto.

2. The California ISO is a nonprofit public benefit corporation chartered under the laws of the State of California for the purpose of ensuring efficient use and reliable operation of the electric transmission grid under its operational control. As part of its responsibilities, the California ISO performs transmission

planning functions for its planning area. These processes examine forecasts of electricity use and changes in resource portfolios to ensure sufficient infrastructure is available to serve electric customers. The California ISO has used these processes to help facilitate the development of a large increase in renewable resources in its planning area while maintaining electric grid reliability.

3. I received a Bachelor of Science in Electrical Engineering degree at the University of Saskatchewan, Canada, and am a registered professional engineer in the province of Alberta. I have been employed for over 30 years in the electricity industry, primarily with a major Canadian investor-owned utility, TransAlta Utilities, and with the Alberta Electric System Operator and its predecessor organizations. Within those organizations, I have held management and executive roles responsible for transmission planning. Since November 2010, I have been employed at the California ISO, leading the Transmission Planning and Grid Asset departments.

4. Similar to other independent system operators and regional transmission organizations operating in the United States, the California ISO conducts an annual transmission planning process. The California ISO's planning process takes a long-term (10 year) analytical approach to transmission planning. The California ISO undertakes this process pursuant to its tariff approved by the Federal Energy Regulatory Commission and consistent with mandatory transmission planning

reliability standards developed by the Electric Reliability Organization of North America as well as the California ISO's own planning standards. This process assesses and identifies reliability-driven, policy-driven, or economic-driven transmission system needs, ensures that the California ISO meets all applicable reliability standards and planning standards, and also identifies efficient solutions to ensure continued compliance with those standards and reliable operation of the electric grid.

5. The California ISO has used this process to identify transmission needs to support grid reliability. For example, after the closure of the San Onofre Nuclear Generating Station in 2013, the difficulty in siting replacement generation in the Los Angeles basin - in part because of emission constraints – necessitated that the California ISO identify transmission upgrades as part of the solution to ensure customers in Southern California would continue to receive reliable electric service.

6. Another instance of the California ISO's use of its transmission planning process to assess electric grid reliability needs arises from implementation of restrictions on the use of coastal or estuary waters for power plant cooling. These restrictions have resulted or will result in the retirement or repowering of a large number of coastal power plants. The California ISO's transmission planning process provides a mechanism to assess the impacts of those planned retirements

and identify new infrastructure projects necessary for the reliable operation of the electric grid. The California ISO shares this information in a collaborative process with California state energy and environmental agencies and, if electric reliability is at risk, the California ISO may trigger a regulatory review of the compliance schedule implementing the once through cooling restrictions.

7. Since 2011, the California ISO's transmission planning process has identified transmission needs based on federal and state policies. This feature was reinforced by the final rule of the Federal Energy Regulatory Commission involving regional transmission planning and cost allocation, known as Order 1000. This rule requires that transmission planning processes consider transmission needs driven by public policy requirements established by state or federal laws or regulations.

8. A significant focus of the California ISO's policy-driven transmission planning has been to assess and identify transmission needs to achieve California's renewable portfolio standard, which is a component of the state's policies to achieve carbon reduction goals. These policies have resulted in substantial investment in new renewable generation capacity both inside and outside of California. Through its planning process, the California ISO has identified sufficient transmission projects to meet a 33 percent renewable portfolio standard by 2020.

9. The California ISO's transmission planning process uses each planning cycle to incorporate updated information involving implementation of these policies to ensure the transmission system can support the renewable energy goal. The California ISO will continue to identify needs based on policies such as California's increased renewable portfolio standard by 2030, as well as state implementation of the United States Environmental Protection agency's final rule governing greenhouse gas emission from existing generators, known as the Clean Power Plan.

10. To this end, the California ISO's transmission planning process relies on a consultative process. The California ISO, public utilities, state agencies and other stakeholders work closely together to assess how to meet environmental objectives. For example, the California ISO and state agencies have worked to improve infrastructure planning coordination by developing unified assumptions for use within three core processes: (1) the California Energy Commission's long-term forecast of energy demand produced as part of its biennial Integrated Energy Policy Report; (2) a biennial Long-Term Procurement Plan proceeding conducted by the California Public Utilities Commission that authorizes new resource procurements; and (3) the California ISO's annual transmission planning process. As a result, each year the California ISO consults with the state agencies and stakeholders to develop planning assumptions and scenarios for use in

infrastructure planning studies in the coming year. The assumptions include demand, supply, and system infrastructure elements, including likely portfolios of renewable resources.

11. Based on the process alignment achieved to date and the progress in developing common planning assumptions, the California ISO anticipates an orderly identification of system and local needs on the transmission grid resulting from implementation of California's environmental policies and the Clean Power Plan.

12. By identifying system reliability, policy and economic needs in advance, the transmission planning process gives stakeholders time to propose projects to address identified needs. Supply-side resources, including demand response and energy storage resources, can assist in the resolution of transmission reliability issues. Other solutions such as the deployment of synchronous condensers to maintain transmission voltage or investments in energy efficiency can also assist in the resolution of transmission reliability issues. Through its transmission planning process, the California ISO seeks to identify the most efficient or cost-effective means to resolve needs that arise on the transmission system and identify these needs sufficiently in advance to allow for any permitting, procurement and construction activities.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 1, 2015.

Neil Millar
Executive Director, Infrastructure Planning
California Independent System Operator Corporation

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF EDWARD F. RANDOLPH, DIRECTOR, CALIFORNIA PUBLIC UTILITIES COMMISSION, ENERGY DIVISION

I. Professional Expertise and Responsibilities

1. I am the Director of the Energy Division of the California Public Utilities Commission (CPUC), a position I have held since November 2011. In this position, I am responsible for administering and, along with the Safety Enforcement Division, enforcing California's regulation of investor-owned electric and natural gas utilities as well as, to a more limited extent, other retail electricity providers. I make this declaration in support of the State Intervenors' opposition to motions for a stay of the Clean Power Plan.

2. This declaration describes the CPUC's experience to date in decarbonizing the California electric grid and explains why, in my professional view, this experience indicates that the magnitude of the greenhouse gas emission

reductions called for by the U.S. Environmental Protection Agency's (U.S. EPA) Clean Power Plan regulation on greenhouse gas emissions from existing power plants can be achieved in time without straining rates, threatening reliability, or forcing states to upend their electricity sectors. Furthermore, it is my view that the Clean Power Plan will provide important benefits to Californians and to the country generally, and it will enable California to meet its significantly more ambitious emission reduction goals at less cost than we would be able to otherwise.

3. In California, investor-owned electric utilities are subject to cost-of-service regulation, in which the CPUC determines the rates those utilities are entitled to charge customers. Other retail electricity providers in the state include community choice aggregators, electric service providers, and publicly owned utilities.[1] The CPUC has limited oversight over the operations of community choice aggregators and electric service providers: our primary responsibility is to ensure that these entities comply with the state's renewable energy requirements, but our jurisdiction was recently expanded this year, via Senate Bill 350, to ensure that these entities engage in integrated resource planning to meet the state's long-

[1] Community choice aggregators are governmental entities formed by cities and counties that source electricity for their communities. Similarly, electricity service providers are private entities that source electricity on behalf of their retail customers. In both the case of community choice aggregators and electric service providers, the incumbent investor-owned utility is still responsible for delivering the electricity to those end-use customers.

term greenhouse gas emission reduction targets. The CPUC does not regulate publicly owned electric utilities.

4. The electric utilities under CPUC jurisdiction supply electricity to more than three quarters of the customers in California, which accounts for a large majority of total electricity end-use in the state, based on 2013 data from the U.S. Energy Information Agency. To put our jurisdiction in a national perspective, the CPUC regulates the electric service to 8.9 percent of U.S. electric customers. The three largest investor-owned electric utilities in California collectively supply electricity to 10.6 million residential customers. In 2014, all CPUC-jurisdictional load-serving entities, including the investor-owned utilities, community choice aggregators, and electric service providers, collectively procured 52,740 MW of capacity to meet expected peak system demand plus a 15 percent reserve margin.

5. Energy Division's primary and historical responsibility is to assist the CPUC in assuring that regulated utilities provide safe and reliable utility service at reasonable cost. The California Legislature has over the last few decades expanded the CPUC's, and thus Energy Division's, role in reducing greenhouse gas emissions. My staff and I are also responsible for advising the CPUC on matters related to the regulation of electric utilities, including rate and market design, reliability and resource adequacy, renewable energy procurement, energy efficiency programs and demand-side management, customer-owned electricity

generation, electricity storage, environmental review of new infrastructure projects, interconnection rules and grid infrastructure planning, electric vehicle charging and vehicle-to-grid integration, and research and development programs.

II. California's Experience Shows Compliance with the Clean Power Plan Is Possible

A. Greenhouse gas emission reductions are quickly achievable without threatening rates or reliability

6. The CPUC is one of the California agencies responsible for developing and implementing policies to reduce electric-sector greenhouse gas (GHG) emissions while minimizing electricity costs and ensuring the reliability of electric service. As part of California's efforts to reduce GHG emissions to 1990 levels by 2020, the California Air Resources Board (ARB), in partnership with other agencies including the CPUC, developed a Climate Change Scoping Plan, which defined the state's strategy to reduce GHG emissions. The CPUC is the primary agency responsible for overseeing two of the three programs that California estimates will contribute most to reducing GHG emissions: the Renewables Portfolio Standard (RPS), and the investor-owned utilities' energy efficiency programs. The CPUC also oversees the investor-owned utilities' participation in the GHG Cap-and-Trade Program. As part of these responsibilities, the CPUC oversees a combination of both long and short-term planning that includes

approving utility capital investments, electricity procurement contracts, and demonstrations of resource adequacy for reliability. We also coordinate intimately with the California Independent System Operator's (CAISO) transmission planning process.

7. The CPUC's experience overseeing electric utility compliance with the state's Cap-and-Trade Program has demonstrated that the cost impacts on customers have been low, the electricity market has remained stable, and the program is an administratively efficient means of reducing GHG emissions. Public filings from the three largest electric utilities to the CPUC demonstrate that the utilities' projected 2015 Cap-and-Trade-related costs are on average 2% of their total revenue requirement. These costs will total $867 million in 2015, including costs from 2013 that will be amortized in 2015; however, customers will also receive the benefit of $1.1 billion in bill credits in 2015 resulting from the state's GHG emission allowance auctions, such that customer bills as a whole will be $230 million lower than they otherwise would be in 2015 but for the Cap-and-Trade Program.

8. Electric generators began including GHG emission costs in their wholesale market bids on January 1, 2012, when electric-sector emissions became covered under Cap-and-Trade. Since then, economic dispatch in the CAISO's wholesale markets has reflected generators' GHG emission costs. Quarterly reports

from the CAISO's Department of Market Monitoring demonstrate that Cap-and-Trade has not led to unexpected market volatility or negative reliability impacts to date: the impact of Cap-and-Trade on day-ahead market prices is highly consistent with the cost of California GHG emission allowances and the efficiency of natural gas generators that typically set the day-ahead market price.

9. From an administrative perspective, the CPUC's responsibilities under Cap-and-Trade have been relatively straightforward to implement, because Cap-and-Trade is a market-based program. Cap-and-Trade has also made it easier for the public to have insight into the emissions intensity of their electricity, due to public reporting requirements the CPUC has required of the utilities and the transparent price of GHG emissions.

10. The CPUC has decades of experience designing and overseeing portfolios of energy efficiency programs that have been widely recognized by independent organizations as among the most ambitious and successful in the country. The CPUC is responsible for fulfilling a statutory mandate to ensure that the investor-owned utilities pursue all cost-effective energy efficiency opportunities. To achieve this mandate, the CPUC requires the investor-owned utilities to pursue rolling two- to three-year portfolios of energy-efficiency resources, measures and programs funded by electricity ratepayers. These portfolios have typically included rebates for appliances and measures that achieve

above-code efficiency standards; financing to support building retrofits; support to develop new codes and standards for building and appliance efficiency; mechanisms and funding to engage local government and community organizations in efforts to improve energy efficiency; statewide education and outreach; and an evaluation, monitoring and verification program to measure energy efficiency savings and ensure that they are real, additional and verifiable. Between 2006 and 2012, the most recent period for which we have evaluated savings data, energy efficiency programs and measures in the investor-owned utilities' territories have achieved 17,557 GWh of cumulative gross annual energy efficiency savings and have avoided a cumulative 4,056 MW of generation capacity.

11. The CPUC has thirteen years of experience overseeing one of the more ambitious RPS programs in the country. The CPUC's primary responsibilities have been to establish mechanisms for the investor-owned utilities to procure renewable energy resources, to review the utilities' and other electric service providers' procurement plans to meet RPS targets, to evaluate the utilities' competitive solicitations and review utility contracts for renewable resources, to coordinate with long-term reliability and transmission planning efforts, and to report to the Legislature on the utilities' and electric service providers' progress toward meeting RPS targets. The lessons we have learned through analysis, planning and the

results our regulated utilities have achieved indicate that there are sufficient renewable resources to meet the state's RPS goals, renewable energy costs have declined significantly over time and are likely to continue to do so, and California utilities have been able to accelerate the rate at which they deploy new renewable generation.[2]

12. California's current RPS program requirement is to supply a minimum of 33 percent of the state's retail electricity sales from eligible renewable resources by 2020. On September 11, 2015, the Legislature extended the RPS requirement to a minimum of 50 percent of electricity sales from renewable resources by 2030, a policy change that the CPUC will begin implementing. The three largest electric utilities the CPUC regulates are on track to achieve the 2020 requirement. Between 2003 and 2014, 11,054 MW of renewable capacity achieved commercial operation

[2] We have insight into the costs of renewable resources through our oversight of the utilities' competitive solicitations and contracts that the utilities submit for approval. Evidence from these solicitations and contracts indicates that renewable electricity prices are declining. While the average time-of-delivery-adjusted price of contracts approved by the CPUC from 2003 to 2014 increased from 5.4 cents/kWh to 7.4 cents/kWh in nominal dollars, the prices decreased from 9.2 cents/kWh to 7.4 cents/kWh in real dollars. One reason for the increase in nominal contract pricing is that the utilities contracted with existing renewable facilities in the first years of the RPS program versus contracting with mostly new facilities as the RPS program developed. The decrease in RPS contract prices in terms of real dollars indicates that the renewable market in California is robust and competitive and has matured since the start of the RPS program. Additionally, RPS contract prices approved by the CPUC in 2014 are lower than the nominal prices of contracts approved in 2013 (7.4 cents/kWh in 2014 versus 8.1 cent/kWhs in 2013).

under the RPS program. Additionally, in 2015, 2,098 MW of renewable capacity is forecasted to achieve commercial operation. To put these figures in perspective, total installed in-state electric generation capacity was 78.9 GW in 2014, according data published by the California Energy Commission. CPUC-regulated utilities have been able to achieve these results through a combination of regular competitive solicitations designed to identify resources that provide the most value to ratepayers, as well as multi-agency efforts to coordinate and streamline interconnection and transmission planning to minimize project development costs and timelines.

13. Similarly, California has increased the use of solar power through the California Solar Initiative, a declining-rate incentive program that began in January 2007 with a goal of installing 1,940 MW of solar electric capacity on customer-owned facilities by the end of 2016. The program was intended to transform the market for solar energy by reducing the cost of solar generating equipment and, along with other statewide solar programs, to transition the solar industry to a point where it can be self-sustaining without subsidies. At the end of 2006, before the California Solar Initiative began, California had 156 MW of customer-sited solar generation at 22,000 sites. By the end of 2014, the state had 2,529 MW of installed solar capacity on 302,000 sites in investor-owned electric utilities' territories. Between the last quarter of 2008 and the last quarter of 2014, the average cost of

installed residential solar systems decreased 53 percent from $10.87 per watt to $5.14 per watt, and non-residential system costs decreased 62 percent from an average of $10.93 per watt to $3.93 per watt. Since 2014, many of the rebate programs under the California Solar Initiative have closed as funding has become fully subscribed, as planned; however statewide solar installations have continued to increase. The latest statistics available since the 2014 annual program assessment indicate that as of November 11, 2015, California customers of the investor-owned electric utilities have installed 438,225 solar electric projects totaling 3,457 MW of capacity.[3]

14. The CPUC and California Energy Commission also enforce an Emissions Performance Standard, established by the California Legislature, which prohibits utilities from making any long-term financial commitments with power plants that cannot meet the emissions rate of a combined-cycle gas turbine power plant. In 2007, the CPUC set this emission limit at 1,100 pounds of CO_2 per MWh on an interim basis and may revise the target in the future. This emission rate standard helped the state rein in its reliance on inefficient coal-fired generators.

15. Together, these policies have resulted in significant GHG emission reductions without disrupting rates or reliability. These policies can be flexibly

[3] See www.californiasolarstatistics.ca.gov for regularly updated data.

applied within the context of either a rate-based or a mass-based strategy to comply with the Clean Power Plan.

B. California Is on track to comply with its Clean Power Plan targets without threatening rates or reliability

16. The policies described above have resulted in emissions levels and emissions rates that place California on track to comply with California's Clean Power Plan targets, even though California's targets are among the most stringent of any state.[4] California can achieve those stringent targets without disrupting rates, reliability or economic growth.

17. The Clean Power Plan provides states with sufficient time to comply with its targets. States that choose to write their own plans have up to nine years before they must meet the CPP's interim emission reduction targets, and fifteen years to meet the final targets. As a point of reference, most of the programs and policies California has in place today took far less time to bear fruit. For example,

[4] U.S. EPA's California Fact Sheet states that California's electric emissions from covered generators were 46.1 million short tons in 2012, which is below the federal emissions goal for California of 48.6 million short tons by 2030. Additionally, U.S. EPA projects that California's greenhouse gas emissions rate will be 712 lbs/MWh in 2020 based on existing policy, which is below the federal 2030 goal for California of 828 lbs/MWh. U.S. EPA states that California's emission-rate goal of 828 lbs/MWh is one of the more stringent state goals, compared to other state goals in the final Clean Power Plan. *See* www.epa.gov/airquality/cpptoolbox/california.pdf.

in just six years from passage of the RPS, the bulk of RPS-eligible generation capacity under contract with California investor-owned electric utilities began commercial operation.[5] Similarly, in just eight years, CPUC's California Solar Initiative led to the installation of an additional 3,300 MW of renewable capacity.

18. Within the same timeline as the Clean Power Plan, California is working to achieve GHG reductions on a scale that far exceeds the state's federal targets. California's current statutory goals are to obtain 50 percent of electricity from renewable resources by 2030, achieve a cumulative doubling of statewide energy efficiency savings in retail customers' electricity and natural gas final end uses, and reduce economy wide GHG emissions 40 percent from 1990 levels by 2030. Additionally, the state is working to encourage the adoption of 1.5 million zero-emission vehicles by 2025, which may significantly increase overall demand for electricity. The challenge of meeting these goals far exceeds what the Clean Power Plan requires of California or any other state.

III. Rates and Reliability Will Benefit from the Clean Power Plan

A. Climate change threatens electric rates and reliability in California

[5] California's investor-owned utilities have 22,588 MW of RPS-eligible resources in their portfolios. Of this, 16,200 MW—more than 70 percent—began commercial operation since 2010.

19. Climate change poses numerous threats to Californians and the physical and biological systems on which our economy depends. The drivers and expected effects of climate change on California are documented extensively in the California Environmental Protection Agency's report, *Indicators of Climate Change in California*, which compiles large amounts of scientific data from state and federal agencies, universities and other researchers to identify indicators that reflect how temperature and precipitation are changing as a result of increased greenhouse gas emissions and how these changes affect physical and biological elements of the environment.[6] The indicators tracked in the report reveal evidence of already discernable impacts of climate change, including warmer weather, more extreme heat events, decreased water volumes of snowmelt, increased sea levels, increased heat-related tree mortality, and increased acreage burned by wildfires, among many other impacts.

20. Aside from their effects on the overall economy and the livelihoods of Californians, temperature and weather-related impacts of climate change affect the electricity sector in specific ways: reduced snowmelt reduces the availability of hydropower; increased atmospheric temperature and surface water temperatures

[6] See Indicators of Climate Change in California, 2013 Edition, compiled by the California Environmental Protection Agency Office of Environmental Health Hazard Assessment, available at: http://oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsReport2013.pdf.

affect the efficiency of thermal power plants, and the increased frequency of heat waves places additional stress on the grid during peak-demand periods, all of which increase the cost of maintaining a reliable electricity grid.

21. California is currently facing a drought on a scale not experienced in 500 years. The most recent studies indicate that the severity of the drought is a product both of natural cycles and anthropocentric GHG emissions. The drought has led to one of the worst seasons of forest fires on record, which not only stresses the state's resources but also threatens the reliability of the electric grid. In September 2015, fires damaged parts of The Geysers 725 MW geothermal power plants during one of the state's peak months of electricity demand. Persistently low levels of rain and snowfall have also substantially diminished the availability of the state's hydropower resources, on which we have historically relied to meet peak demand. A low-carbon electric grid is achievable and is in the interest of all parties.

22. The Clean Power Plan will help mitigate the impacts of climate change and its serious threats to people and the grid, which California is already facing. Any actions to stay the U.S. EPA regulation and delay its implementation will also delay planning efforts to reduce GHG emissions and will exacerbate the risks of climate change and the costs of managing it. As a coastal state with many arid regions and an agricultural industry that feeds much of the nation, Californians are

especially vulnerable to the effects of sea level rise and the increasing droughts that are resulting from climate change.

B. Moving away from fossil fuels stabilizes rates

23. California's movement away from fossil-fueled resources toward increasing quantities of fixed-cost renewable resources has had a stabilizing effect on electricity rates. California's electric utilities rely on portfolios of both fossil-fuel and zero-emission resources, such as renewables, nuclear and large hydro. Contracts with fossil-fueled resources contain energy-pricing terms indexed to the market price of natural gas, and as a result the costs of these resources can be unpredictable and widely variable. For example, in the winter of early 2014 extreme cold in eastern states created a spike in natural gas demand that led to a supply shortage in the west and a corresponding spike in electricity prices. Overreliance on fossil-fueled resources is an economic and reliability risk to California electric customers, because the costs and availability of these resources is subject to macroeconomic conditions over which states and utilities have little to no control.

24. By contrast, the vast majority of renewable resources and demand-side measures have no fuel costs, contract prices are stable and predictable, and they act to stabilize rates in the long run and protect utilities from unexpected revenue

shortfalls in the near-term. The nonprofit organization Ceres[7] came to similar conclusions in its report "*Practicing Risk-Aware Electricity Regulation*,"[8] recommending that state electricity regulators can minimize the financial and environmental risk borne by electricity customers by ensuring that utilities diversify their electricity generation portfolios away from narrow reliance on fossil and nuclear resources, and instead place more emphasis on renewable resources and energy efficiency.

C. California's electric bills are among the lowest in the nation

25. California residential customers pay monthly electric bills that are among the lowest in the nation, both in cost and overall consumption. In 2013 California households' average monthly electricity bills ranked the 45th lowest in cost among all U.S. states and Washington D.C., based on U.S. Energy Information Administration data.[9] Overall electricity use and cost are among the lowest in the nation thanks to California's suite of complimentary clean energy programs. California has pursued an integrated set of policies that are intended

[7] www.ceres.org.

[8] See, *Practicing Risk-Aware Regulation: What Every State Regulator Needs to Know*, available at www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation.

[9] See, U.S. Energy Information Administration Form EIA-861 data for 2013 Average Monthly Bills at www.eia.gov/electricity/sales_revenue_price/xls/table5_a.xls

both to change the structure of the state's electricity supply and to significantly improve end-use energy efficiency and reduce consumption.

26. This combined focus on supply and demand resources has resulted in electricity supply that has low emissions, and buildings and appliances that are highly efficient, without disproportionately burdening customers with high bills. California's ability to control costs points to the importance of energy efficiency and conservation measures as compliments to supply-side measures that decrease a state's dependence on high-emission fossil-fueled resources.

D. The Clean Power Plan will improve availability of renewables, energy efficiency, and other pollution control measures

27. The Clean Power Plan is likely to help California to achieve its GHG emission reduction goals, renewable energy goals, and energy efficiency goals at lower cost and with greater ease than we would be able to without the Clean Power Plan. The Clean Power Plan is likely to further expand the nation's renewable energy market as well as research that aids in the development of renewable energy. The Clean Power Plan will also promote further expansion of the diversity and ability of firms that can provide renewable energy and energy efficiency services. By increasing the demand for renewable energy, the Clean Power Plan will put additional downward pressure on renewable energy costs, which have declined over time and are likely to decline faster as more states establish RPS

goals and energy efficiency programs at levels necessary to comply with Clean Power Plan emission targets. Similarly, California expects that the Clean Power Plan will improve the availability and reduce the costs of energy efficiency and pollution control measures by expanding the market for these resources, by encouraging additional research in these areas, and by providing clear and stable investment signals to the private sector.

28. California has learned through its RPS and energy efficiency programs that stable market signals are necessary to help the private sector make effective decisions about how and when to invest resources. Our RPS and energy efficiency programs are successful in part because the state's long-term commitment to these resources has helped to cultivate a network of private businesses and organizations capable of providing technology and services to meet our program goals. The Clean Power Plan has the potential to expand these markets and create new opportunities for the private sector. A stay of the Clean Power Plan, however, would cast uncertainty over the regulation and may slow the private sector from ramping up investments that will be necessary to support the kinds of measures that states, utilities and electricity generators will need to pursue to reduce greenhouse gas emissions and comply with the Clean Power Plan.

29. California is already experiencing renewed interest from government, non-profit, and private organizations in other states in developing renewable

energy and energy efficiency projects to generate Clean Power Plan Emission Reduction Credits or in supporting measurement and tracking systems to support markets for these credits. The California Energy Commission led a multi-stakeholder workgroup that is reviewing and making recommendations as to how the existing Western Renewable Energy Generation Information System could be modified to support such tracking and trading. To the extent that a market for Clean Power Plan Emission Reduction Credits provides additional revenue streams and liquidity for new efficiency or renewable energy projects, California expects that it would increase supply and lower total costs for all such projects.

IV. Public Utilities Commissions Regularly Engage in the Type of Planning Envisioned by the Clean Power Plan.

A. CPUC coordinates with other agencies to ensure long-term reliability in light of effects of emissions reductions efforts.

30. Energy Division staff participate in regular meetings with the California Air Resources Board (ARB) and the California Energy Commission to coordinate the state's responses to the Clean Power Plan. This coordination is not unique to the Clean Power Plan; the CPUC, ARB and the California Energy Commission are regularly, and increasingly, involved in broad multi-agency efforts to reduce greenhouse gas emissions in California, which is evident in the state's Climate

Change Scoping Plan and the range of measures that California agencies have been taking to reduce greenhouse gas emissions.

31. Since 2003, the CPUC has engaged in a cyclical long-term procurement planning process in coordination with the California Energy Commission, CAISO, utilities and other stakeholders to ensure that the state has adequate resources to meet both system and local grid reliability needs. This planning process evaluates resource needs within a ten-year timeline and, if warranted, directs the utilities to contract for the construction of new resources that have attributes necessary to satisfy grid reliability needs. In recent years, the CPUC has become increasingly specific in the resource attributes (i.e., technology type, minimum and maximum capacity, geographic location) it authorizes utilities to procure. The state's electricity demand forecast is a primary input into this proceeding and it reflects the impacts that CPUC programs like energy efficiency, demand response, the RPS and customer-owned generation will have on the state's energy demand and resource supply. Additionally, the CAISO's transmission plans and operational details about the existing generation fleet are also key inputs to the CPUC's long-term planning proceeding. Based on these inputs and production simulation modeling, the CPUC evaluates whether there will be sufficient resources in ten years to meet projected electricity demand.

B. CPUC regularly engages in short- and medium-term resource planning to account for plan retirements and retrofits, including those caused by federal mandates

32. The CPUC has recent experience responding to short and medium-term challenges affecting a significant portion of the state's electric generation fleet. This experience has included incorporating federal environmental regulations into electric-sector planning.

1. Retirements and Retrofits Caused by State's Decision to Phase Out Once-Through-Cooling, in Response to Clean Water Act Section 316(b)

33. One such case resulted from California's effort to comply with federal Clean Water Act section 316(b), 33 U.S.C. § 1326(b). In response to the federal mandate in that section, the California State Water Board adopted a policy to phase out the use of coastal and estuarine waters for power plant cooling (also known as once-through cooling) in 2010. Knowing that once-through-cooling-based generation represented about a quarter of California's installed capacity (approximately 19 GW), the Water Board worked with the CPUC, CAISO and a variety of other state agencies when developing the implementation schedule. Implementation was phased over several years to allow the CPUC resource-planning process and CAISO transmission-planning process to evaluate local reliability issues, evaluate alternate solutions, and then authorize and build new

resources. The Water Board also established an advisory committee[10] to monitor policy implementation and system reliability as new resources came online and older resources retire. Over 5 GW of capacity has retired to date, with the next tranche planned for December 2018 and the largest amount of facility retirements expected in 2020.

34. The CPUC is currently planning for a contingency in which all 19 GW of affected units retire. Because many of the resources using once-through cooling were older and less efficient than modern facilities, the state's normal process of replacing aging resources has facilitated compliance. Resources authorized in the CPUC's 2004 and 2006 long-term procurement planning (LTPP) proceeding as well as transmission upgrades approved by the CAISO provided sufficient reliability to retire several once-through–cooling resources. Energy efficiency gains and resources built to meet renewable goals have also helped make the generation fleet cleaner and reduced electric load, effectively making it unnecessary to replace all once-through–cooling plants megawatt-for-megawatt with new generation.

35. The new plants being built also have different operating characteristics that reflect the state's changing electricity grid and policy priorities: many of the

[10] The Statewide Advisory Committee On Cooling Water Intake Structures includes staff from the Water Board, CPUC, the California Energy Commission, CAISO, ARB, Coastal Commission and State Lands Commission.

new natural gas facilities being built to replace baseload once-through–cooling plants are peaker plants used primarily to integrate renewable resources. The staff of the participating agencies work closely to understand rule changes that may impact resource selection and permit approvals, such as South Coast Air Quality Management District's Rule 1304 concerning particulate matter (PM) 10 and PM 2.5 emissions.

2. Unexpected Retirement of San Onofre Nuclear Power Plan, in Part Due to Nuclear Regulatory Commission Action

36. The California energy agencies' reliability process also responded successfully when the 2300 MW San Onofre Nuclear Generating Station (San Onofre) retired unexpectedly in 2012. The CPUC opened a special phase of its 2012 long-term procurement planning proceeding to examine reliability issues created by the retirement of San Onofre, while the California Energy Commission and CAISO performed targeted studies. Other state agencies also participated in expediting analyses and reviews necessary to understand the state's ability to site new resources quickly. In the near term, two previously retired once-through–cooling steam turbines were converted to synchronous condensers and quickly brought on-line to provide inertia and reactive power support. Rarely used once-through–cooling plants were operated more frequently, and the CPUC accelerated

its exploration of options to expand the use of zero-carbon resources in the affected region.

37. To provide long-term, low GHG-emission generation and transmission resources to fulfill any local area reliability needs previously served by San Onofre, the CPUC authorized the construction or implementation of a variety of resources (natural gas plants, storage facilities, energy efficiently programs, demand response programs, and distributed renewable generation) in 2014, and the CAISO authorized transmission system upgrades (new transmission lines and synchronous condensers). The CPUC, CAISO, California Energy Commission and Water Board advisory committee are all monitoring the development of the new resources, assessing possible impacts on the once-through cooling compliance schedule, and analyzing contingencies in case planned activities do not occur on schedule. To date, no reliability events have occurred as a result of the unexpected retirement of San Onofre.

3. Reliability Planning and Power Plant Permitting Rules to Meet National Ambient Air Quality Standards for Particulate Matter

38. In addition to the impact that Clean Water Act section 316(b) has had on electric generators that use once-through cooling, the CPUC has had to evaluate the impacts of the U.S. EPA's National Ambient Air Quality Standard (NAAQS) for particulate matter (PM 10 and PM 2.5). The EPA's PM 10 standards have most

impacted electric reliability planning in the region covered by California's South Coast Air Quality Management District (SCAQMD), which includes Los Angeles, Orange, Riverside, and San Bernardino counties, and which is the largest population area in the state. The SCAQMD region also has a constrained electric transmission system that requires local electric generation to ensure electric reliability.

39. Since 2007, an interagency working group composed of the CPUC, California Energy Commission, CAISO, Water Resources Control Board, and ARB have collectively examined electric reliability impacts, electric generator retirement schedules and other relevant information to advise the SCAQMD on an appropriate PM 10 compliance program. The CPUC also currently factors PM 10 constraints into long-term electric reliability planning for the Los Angeles Basin. Similarly, in 2012 the U.S. EPA lowered federal PM 2.5 standard from 15.0 micrograms per cubic meter to 12.0 micrograms per cubic meter, and the ARB convened the existing PM 10 interagency working group to assess the impact of the revised standard on power plant operations and electric reliability.

V. A Stay Will Harm Rates and Reliability in California, Either by Delaying Compliance Deadlines or by Potentially Shortening the Planning Horizon and Complicating Planning Efforts, Especially with Regard to Regional Cooperation

40. The benefits of the Clean Power Plan described above will be harder to capture if the rule is stayed. A stay of the CPP will make it more difficult to smoothly adopt and implement new mandates or to develop regional partnerships necessary to comply with the rule. If a stay results in compliance deadlines being delayed to allow states additional time to file plans, the risks and costs of climate change will continue to accrue. Whether or not compliance deadlines change, the careful planning needed to shift away from expensive high-carbon sources as efficiently as possible will be harder to conduct. Staying the Clean Power Plan will lead to continued climate risk and financial risk to ratepayers, and will delay states from taking the kinds of reasonable measures that California has demonstrated are achievable and compatible with both grid reliability and electric customers' economic welfare.

41. Furthermore, California is currently experiencing intensified interest from neighboring states and their electricity planners, balancing authorities, and load serving companies in collaboratively planning for GHG reductions, renewable development, transmission investments, and increased market coordination. Stakeholders from across the West are actively planning for a lower-carbon electricity future and identifying priority generation, transmission, and electricity market projects based, in part, on expectations of Clean Power Plan compliance requirements. This activity—taking place in venues including the Western

Electricity Coordination Council, Western Interstate Energy Board, Western Conference of Public Service Commissioners, and in specific initiatives such as the California Independent System Operator's Energy Imbalance Market and the Renewable Energy Transmission Initiative 2.0—represents the most promising regional-coordination effort since before the California Electricity Crisis, and holds significant potential cost and reliability benefits for ratepayers and local economies across the West by making stronger infrastructure and market linkages across the region. A stay of the Clean Power Plan implementation would inject substantial uncertainty into these activities, threatening to derail momentum for the entire region.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 4, 2015.



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Edward Randolph
Director, California Public Utilities Commission, Energy Division

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al.,	)	
Petitioners,	)	
v.	)	Case No. 15-1363 (and consolidated cases)
United States Environmental Protection Agency, et al.,	)	
Respondents.	)	

DECLARATION OF DALLAS WINSLOW,

CHAIRMAN OF DELAWARE PUBLIC SERVICE COMMISSION

I, Dallas Winslow, hereby declare:

1. I am the current Chairman of the Delaware Public Service Commission (the "Commission"). I was first appointed to the Commission in 2005 and have served as Chairman since 2012. For 30 years, I served the State of Delaware in the Office of the Public Defender, including as Chief of Legal Services, and I remain engaged in the private practice of law in Wilmington. I am also a retired Colonel from the Delaware National Guard. I also served in the Delaware State Senate from 1998 to 2002 as a member of the Republican Caucus from the 4th Senatorial District. While there, I served on the Senate Energy and Transit Committee, Judiciary

Committee, Highways and Transportation Committee, and the Joint Finance Committee.

2. In my role at the Commission, my responsibilities include working to ensure safe, reliable and reasonably priced electric, natural gas, water and wastewater services for Delaware customers. The Commission also has limited regulatory authority over telephone and cable television rates and services.

3. As part of my responsibilities at the Commission, I currently serve as a member of the Board of Directors of the Regional Greenhouse Gas Initiative, Inc., the entity that assists states with the implementation of the Regional Greenhouse Gas Initiative ("RGGI").

4. The purpose of this Declaration is to provide my understanding, on behalf of the Commission, of the Commission's readiness to work with other state agencies and stakeholders to assist with state planning under the United States Environmental Protection Agency's ("EPA") final rules regarding greenhouse gas emissions from existing power plants under Section 111(d) of the Clean Air Act (the "Clean Power Plan"). This Declaration is also intended to provide my understanding of the state's successful participation in RGGI and my expectation based on that experience that Delaware is well positioned to achieve the Clean Power Plan emission reduction goals for the state.

5. On December 3, 2015, the Commission voted by a vote of 4-0 to authorize me to sign this Declaration.

Delaware Public Service Commission

6. Created in 1949 to regulate investor-owned public utilities, the Delaware Public Service Commission has "exclusive original supervision and regulation of all public utilities and also over their rates, property rights, equipment, facilities, service territories and franchises," including "the regulation of the rates, terms and conditions … and, in so regulating, the Commission shall consider the interests of subscribers, if any, … as well as the interests of the consumer of the public utility service."[1] The Commission is made up of five part-time Commissioners, appointed by the Governor and confirmed by the State Senate. The Commissioners are supported and assisted by a staff of full-time state employees. The Commission makes its decisions at formal meetings that are open to the public.

Commission Activities to Address Climate Change and Advance Renewable Energy

7. With respect to climate change and greenhouse gas emissions, the Delaware General Assembly has found that:

> Climate change poses serious potential risks to human health and terrestrial and aquatic ecosystems globally, regionally and in the State…

[1] 26 *Del. C.* § 201(a).

> It is in the interest of the State to protect human health and terrestrial and aquatic ecosystems by taking actions to stabilize and to limit the CO_2 [carbon dioxide] contributions from the State…
>
> A CO_2 reduction program focusing on fossil fuel-fired electricity generation, and the development of a CO_2 allowance trading program, will create a strong incentive for the creation and deployment of more efficient fuel-burning technologies, renewable resources and end-use efficiency resources, which will lead to lower dependence on imported fossil fuels.[2]

8. The Commission, along with other Delaware agencies and stakeholders, has devoted considerable attention to the challenge of mitigating the impacts of climate change through reducing emissions and advancing renewable energy sources.

9. The Commission also has played a significant role in the implementation of RGGI. For example, the Delaware General Assembly authorized my ongoing participation in RGGI, as the Chair of the Public Service Commission, to represent Delaware's interests to implement and participate in RGGI.

10. In July 2005, the Delaware General Assembly enacted the Renewable Energy Portfolio Standards Act.[3] The General Assembly stated that the purpose of the Renewable Energy Portfolio Standards Act was to establish a market for electricity from renewable resources in Delaware and to lower the cost to consumers of electricity from these resources. The Public Service Commission was

[2] 7 *Del. C.* § 6043.
[3] *See* 26 *Del. C.* § 351 *et seq*.

charged with assuring compliance with the Renewable Energy Portfolio Standards ("RPS") and establishing regulations. The Public Service Commission promulgated "Rules and Procedures to Implement the Renewable Energy Portfolio Standard" ("RPS Rules") in 2006 and has revised the RPS Rules from time to time.[4]

11. In August 2014, legislation enabling Delaware electric and gas utilities to provide cost-effective energy efficiency programs to their customers and to help Delaware meet the requirements of the Energy Efficiency Resource Standard was enacted.[5] This legislation created the Energy Efficiency Advisory Council (EEAC). The EEAC, in collaboration with the Public Service Commission Staff and the Public Advocate, will recommend energy efficiency, peak demand reduction, and emission-reducing fuel switching programs. Local jobs will be created by driving investments in energy efficiency that displace more expensive energy supply purchases.

[4] *See* 26 *Del. Admin. C.* § 3008.
[5] 79 *Del. Laws* ch. 395.

RGGI Experience

12. Delaware's experience with RGGI has prepared the state to comply with the Clean Power Plan. Delaware has implemented RGGI,[6] which limits the carbon emissions of fossil fuel-fired power plants in the RGGI states, including in Delaware. In December 2005, the Governor of Delaware along with the Governors of Connecticut, Maine, New Hampshire, New Jersey, New York and Vermont, signed a Memorandum of Understanding that explained the overall goal of RGGI.[7] RGGI creates a cap-and-trade program aimed at reducing emissions in participating states, while maintaining economic growth and maintaining a safe and reliable electric power system. RGGI is the nation's first mandatory greenhouse gas pollution program for carbon dioxide (CO_2) emissions. RGGI is composed of individual CO_2 budget trading programs in each state. Delaware has invested the majority of its CO_2 allowance proceeds in energy efficiency and renewable energy programs.

13. After a comprehensive 2012 Program Review, the nine RGGI states implemented a new RGGI cap of 91 million short tons of CO_2, which will decline 2.5 percent each year from 2015 to 2020.

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[6] *See* 7 *Del. Admin. C.* § 1147 (Dec. 11, 2008).

[7] Maryland and Massachusetts joined RGGI before it was implemented in 2009. New Jersey withdrew from RGGI at the end of 2011.

14. RGGI has been a successful program in Delaware. Auction proceeds are invested in clean energy and energy efficiency programs that benefit the state's customers and help reduce emissions. According to a recent analysis by the Analysis Group for RGGI, Inc., between 2012 and 2014, RGGI created almost 1,000 jobs in Delaware and generated more than $100 million in economic activity in the state.

Clean Power Plan

15. Working with Commission Staff and representatives of other states participating in RGGI, I have followed EPA's development of the Clean Power Plan.

16. I have reviewed the final Clean Power Plan regulations. The regulations establish CO_2 emission performance rates for electric generating units, including power plants in Delaware. The regulations also define guidelines for states to use in preparing state plans to achieve state-specific emission reduction goals. The regulations provide flexibility for states to select from among a number of potential state plan types, including mass-based trading programs like RGGI.

17. As part of the required periodic review of the RGGI program, the RGGI States, including Delaware, are currently working together with the intent of developing state plans under the Clean Power Plan that utilize the structure of the RGGI program. The RGGI States are currently soliciting stakeholder input on

Clean Power Plan compliance. The Commission is participating in some of these stakeholder activities, along with the Delaware Department of Natural Resources and Environmental Control (DNREC). DNREC held an informal listening session on the Clean Power Plan to hear public comments on November 10, 2015 and is accepting comments on Delaware's compliance with the Clean Power Plan through December 31, 2015.

18. I understand that the Clean Power Plan regulations require that states provide an initial submission with an extension request or final plan to EPA by September 6, 2016, with a final plan due by September 6, 2018, if a state was granted an extension in 2016. Based on Delaware's experience implementing the RGGI program, I am confident that Delaware will be able to comply with the state planning requirements of the Clean Power Plan in a timely fashion.

19. The state legislation implementing RGGI contemplates that the state "may transition" to a federal program equivalent to RGGI and authorizes the state to amend its RGGI regulations to transition to the federal program.[8]

20. Based on Delaware's experience with RGGI, the Commission does not anticipate that the Clean Power Plan will adversely affect electric reliability:

[8] 7 *Del. C.* § 6047.

a. Delaware power plants that are subject to RGGI participate in the PJM wholesale electric market and are able to include CO_2 allowance costs in the bids they make when they offer their generation for economic dispatch, much as they can include other environmental compliance and variable costs in their bids. Assuming that Delaware adopts a mass-based state plan, it is likely that this practice will continue without any disruption to the PJM wholesale electric markets.

b. Implementing RGGI has not adversely affected electric reliability in Delaware in any way. Based on this experience, the Commission is confident that the Clean Power Plan will not adversely affect electric reliability in the state.

c. Various studies of the RGGI program have shown that it has modestly decreased electric bills for customers by increasing deployment of cost effective energy efficiency measures, which help lower overall electric demand and costs.

d. Based on my understanding of Delaware's Clean Power Plan goals and the affected electric generating units in the state, Delaware is on track to meet its Clean Power Plan interim and final compliance goals.

21. The Commission and its Staff regularly and routinely work with DNREC to understand and help implement federal environmental requirements, including regulations promulgated by EPA under the Clean Air Act. Commission Staff participates on certain RGGI committees and is a participant in meetings for Executive Order 41: Preparing Delaware for Emerging Climate Impacts and Seizing Economic Opportunities from Reducing Emissions, which was issued September 12, 2013.[9] Executive Order 41 directs state agencies to address both the causes and consequences of climate change in a coordinated and cost-effective manner by developing recommendations. The Commission fully expects this kind of collaboration as Delaware prepares its state plan under the Clean Power Plan.

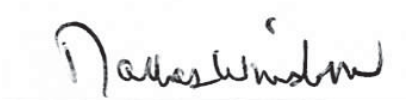
22. A stay of the Clean Power Plan will complicate the Commission's energy planning because it could significantly postpone the integration of the state's planning work under the Clean Power Plan with other state energy and climate planning efforts while a stay is pending.

I declare under penalty of perjury that the foregoing is true and correct.

[9] Available at http://governor.delaware.gov/orders/EO041.pdf.

Approved by a Commission vote of 4-0.

Executed on December 3, 2015.



_____

Dallas Winslow
Chairman
Delaware Public Service Commission

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF AUDREY ZIBELMAN, CHAIR
NEW YORK STATE PUBLIC SERVICE COMMISSION

I, Audrey Zibelman, hereby declare:

1. I am Chair of the New York State Public Service Commission ("Commission") and chief executive officer of the New York State Department of Public Service ("Department"). The Commission is the entity within New York State government that is tasked with the regulatory oversight of public utilities, including electric generation facilities, pursuant to the New York Public Service Law ("PSL"). PSL §§2(12, 13), 4, 5(1)(b), 64-77. I have served in this role since 2013.

2. My duties as Chair of the Commission include organization and oversight of the Department, including directing counsel to the Commission to

represent and appear for the people of the State of New York and the Commission in all actions and proceedings under the PSL and/or within the jurisdiction of the Commission. The Commission has jurisdiction over, among other things, the generation, conveyance, transportation, sale and distribution of electric power, and corporations and other entities owning electric corporations in New York. PSL §§5, 7, 12.

3. I also serve as a member of the Board of Directors of Regional Greenhouse Gas Initiative, Inc., which helps administer the Regional Greenhouse Gas Initiative ("RGGI"), the nation's first multi-state regulatory program specifically designed to reduce carbon dioxide emissions from electric power generating facilities.

4. I have personal knowledge and experience regarding the steps the Department has taken to date that would implement the final Clean Power Plan rule enacted by Respondent United States Environmental Protection Agency ("EPA") pursuant to 42 U.S.C. §7411(d), *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule*, 80 FR 64,662 (Oct. 23, 2015) ("Clean Power Plan").

5. I make this declaration in order to respond to Petitioners' contentions that implementing the Clean Power Plan will negatively impact electric reliability and pricing, will strain state governmental resources, and will require interstate

coordination that is likely to be impractical. To the contrary, New York, acting in concert with eight other Northeastern states through RGGI, has already fulfilled many of the Clean Power Plan's obligations, and has done so without incurring deleterious impacts upon reliability or prices. Moreover, implementing carbon pollution reduction regulations in New York has not consumed an inordinate amount of Commission resources.

6. Initiated in 2005 by founding state governors, RGGI became effective in New York through regulations promulgated in 2008. 6 NYCRR Part 242. In 2005, electric generation from coal-fired units in New York amounted to approximately 21,184 gigawatt-hours (GWh), or 14 percent of the total electricity generated in New York. By 2012, however, production of electricity from New York coal-fired generators had decreased to approximately 4,281 GWh for the year, or 3 percent of the total electricity generated in New York that year. This represents a decrease of almost 80 percent from the 2005 levels. This substantial reduction has not caused any detrimental effects upon electric system reliability, given the processes described in paragraph 12 below.

7. Conversely, the amount of electricity produced by natural gas has roughly doubled since 2005. This is not only due to increased deployment of existing facilities, but also because approximately 4,400 megawatts (MW) of new

gas generation (based on nameplate rating) have been constructed in New York since that year.

8. In addition, approximately 2,400 MW of renewable electric generation has been developed in New York since the commencement of RGGI. An additional 330 MW of "behind-the-meter" renewable generation has also been deployed by individual consumers.

9. Furthermore, the Commission has built upon RGGI with additional programs. In 2007, it initiated the Energy Efficiency Portfolio Standard, the goal of which is to balance cost impacts, resource diversity, and environmental effects by decreasing New York State's energy use through increased conservation and efficiency. In 2014, it commenced efforts to implement Governor Andrew M. Cuomo's Reforming the Energy Vision initiative, which will further reduce carbon emissions through improved grid and load management, thereby optimizing the use of cleaner and more efficient generation technologies – including but not limited to customer-deployed generation resources.

10. And, since 2008, New York energy prices – both wholesale and retail – have generally declined, based on pricing data collected and maintained by the New York Independent System Operator, Inc. (NYISO).

11. The move away from coal and toward natural gas and renewable energy such as wind and solar is also consistent with competitive market trends.

Natural gas prices have been deregulated, which has led to new gas supplies and substantially decreasing gas prices. Meanwhile, coal commodity prices have remained relatively flat. Rather than resisting this market trend, New York has taken advantage of it, enabling electric consumers to enjoy the consequential economic and environmental benefits.

12. Since 2005, New York has had a collaborative, orderly process in place to ensure that when an existing generator proposes to cease providing service, for example to comply with a federal or state environmental regulation, system reliability is not jeopardized. That process requires generating facility owners to notify the Commission 180 days in advance of a proposed retirement of a facility with a capability greater than or equal to 80 MW. Filing this notice triggers a system reliability study, conducted jointly by NYISO and any affected utilities, to determine whether the proposed retirement would impair reliable operation of the system. If the study concludes that continued operation of the facility is not needed for system reliability, then it may retire. Otherwise, the facility may be directed to continue operating subject to an agreement that specifies the terms and conditions of operation as needed to support system reliability, and the compensation to be provided.[1]

[1] Case 05-E-0889, *Proceeding on Motion of the Commission to Establish Policies and Procedures Regarding Generator Unit Retirements*, Order Adopting Notice Requirements (issued December 20, 2005).

13. Generator retirement is not irreversible. In recent times, retired coal-fired generators in New York have been, or are proposed to be, returned to service by retrofitting them to run on natural gas. In particular, the Danskammer Generating Station in Newburgh, New York was returned to service in October 2014. Also, the Commission approved a ratepayer-funded coal-to-gas repowering of the Dunkirk Generating Station in Dunkirk, New York, at a cost of less than fifty cents per month to an average residential electric consumer.

14. Further, in contrast to Petitioners' assertions, implementing carbon pollution regulations in New York has not required the Commission to regularly issue generator-specific directives. Inasmuch as RGGI is built around a system of carbon emission allowance trading among electric generators (as explained more fully in the accompanying Declaration of Jared Snyder), it is a market-driven program, rather than command-and-control.

15. New York has already reduced its electric power sector carbon emissions by more than 40 percent from 2005 levels, and it intends to continue reducing emissions further. But I believe that the problem of greenhouse gas emissions is too serious to be left to individual states; rather, it demands an intense, coordinated and equitable national effort. Any delay in implementing the Clean Power Plan would therefore be inequitable to the states which have already

reduced their carbon emissions, and would likewise be contrary to the interests of the general public.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 3, 2015.



Audrey Zibelman
Chair, New York State Public Service Commission

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA

STATE OF WEST VIRGINIA, *et al.*	)	
	)	
Petitioners,	)	
	)	
v.	)	Docket No. 15-1363
	)	
UNITED STATES ENVIROMENTAL PROTECTION AGENCY, and REGINA A. MCCARTHY, Administrator, United States Environmental Protection Agency	)	
	)	
Respondents.	)	

DECLARATION OF MAYOR SUZANNE JONES
ON BEHALF OF THE CITY OF BOULDER, COLORADO

I, Suzanne Jones, declare as follows:

1. I am the Mayor of the City of Boulder, and I have first-hand knowledge of the facts set forth below.

BACKGROUND

2. The City of Boulder (hereafter the "City") is the home rule municipality that is the county seat and the most populous municipality of Boulder County and the 11th most populous municipality in Colorado.
3. The City is home of the main campus of the University of Colorado, the state's largest university, and is home to a high concentration of climate scientists working at 13 different federal labs on related topics. More than a dozen of these scientists from the

National Center for Atmospheric Research, the National Oceanic and Atmospheric Administration, and the University of Colorado, contributed to the 2013 Intergovernmental Panel on Climate Change Fifth Assessment Report.

4. The City has a long history of innovative initiatives related to sustainability and climate change and to assisting other communities as an innovation partner.

CLIMATE-RELATED THREATS TO THE BOULDER REGION

5. According to the National Climatic Data Center, the frequency of billion-dollar extreme weather events from severe storms, flooding, droughts and wildfires has increased dramatically in recent years, trending from an average of less than three events per year in the 1980s to an average of nearly ten events per year from 2010 to 2014.
6. Global climate change is one of the most significant threats facing local communities and will affect Boulder's ability to deliver services including fire protection and other emergency services, flood control and public works projects, and health care and social services for vulnerable populations.
7. A 2015 report by the University of Colorado Boulder and Colorado State University to the Colorado Energy office states that Colorado's climate has warmed in recent decades, and climate models unanimously project this warming trend will continue into the future. Although the actual pace of warming is dependent on the rate of worldwide greenhouse gas emissions, climate change has impacted and will continue to impact Colorado's resources in a variety of ways, including more rapid snowmelt, longer and more severe droughts, and longer growing seasons.
8. The City has seen several significant impacts from climate change. These include increased risk of wildfires, devastating flooding, and loss of snowpack for water storage.

9. Since 1989, Boulder County has experienced four major wildland fires, the last of which was the Fourmile Canyon fire in 2010. The Fourmile Canyon fire destroyed over 6,000 acres of forest and 168 homes. The City's principal water treatment facility is in the region affected by the fire and was placed at risk.
10. In September 2013, the City experienced a flood that caused damages estimated as high as $150 million. In our region, four people died, 1,202 people were airlifted from their homes, and 345 homes were destroyed. Over a period of eight days, Boulder received an unprecedented 17.15 inches of rain. To put this into context, Boulder's annual average precipitation is just 19.14 inches. In September, Boulder normally averages just 1.61 inches of rain.
11. This disaster was so widespread and devastating that the Boulder County Board of Commissioners declared a county-wide disaster, the Governor declared the flood a state disaster, and the President declared the flood a national disaster.
12. Perhaps the most significant long-term impact of climate change to Boulder is the potential for impacts to water supply. Increased temperatures will require larger amounts of water to sustain outdoor uses such as agriculture and urban tree canopies. Approximately 89% of the water consumption in Colorado is associated with agriculture so even a modest increase in agricultural water needs will have a significant impact on overall water demands in the state.
13. Like most water users in Colorado, Boulder's water supply infrastructure depends on the accumulation of snowpack in the Rocky Mountains during winter months followed by a predictable melting and runoff into storage reservoirs throughout the rest of the year. A significant shift from snow to rain or in the timing of runoff would result in a shortfall in

water supply because reservoirs are not sized to hold water supply that historically was held in the snowpack.

14. Although virtually any aspect of Boulder's economy could be affected by changes in the climate, specific industries that rely on natural resources—agriculture, tourism and recreation, and mining and extraction—are particularly vulnerable. Reduced snowpack is an obvious sensitivity in the ski sector, but also important are earlier melt as well as seasonal shifts in temperature, which can exacerbate wildfire potential, negatively affect plants and wildlife, ands increase public exposure to vector-borne diseases.
15. While Boulder's vulnerabilities to climate related risks are not entirely unique, Boulder was selected as one of 100 global cities to participate in the Rockefeller 100 Resilient Cities initiative to design replicable methodologies that will enable communities to quickly assess risks, identify opportunities, and implement a short- and long-term vision.

BOULDER'S EFFORTS TO ADDRESS IMPACTS FROM CLIMATE CHANGE

16. I and the City of Boulder understand that restraining global warming to an increase of no more than 2 degrees Celsius over the pre-industrial average will require changes in how the world produces and uses energy to power its cities and factories, heats and cools buildings, as well as move people and goods in airplanes, trains, cars, ships and trucks.
17. Since 2006, Boulder City Council has maintained climate change as one of its top three priorities for action. This support has resulted in staffing resources and a commitment to engage in policy reform at the local, regional and state level.
18. In 2002, Boulder became one of the first cities in the nation to support the Kyoto Protocol when the Boulder City Council passed Resolution 906. This commitment

established the goal of reducing the city's greenhouse gas emissions to 7% below 1990 levels by 2012.

19. In November 2006, Boulder voters approved Ballot Issue No. 202, the Climate Action Plan Tax, the nation's first "Carbon Tax." The tax has allowed the community to develop innovative, nationally acclaimed programs that help the community reduce energy use and greenhouse gas emissions—programs like EnergySmart, curbside composting, and expansion of Boulder's bike trail system.
20. Since its inception, the carbon tax has funded more than $8 million in incentives to Boulder residents and businesses through an extensive suite of services and regulations. Much of the first generation of carbon tax funded efforts have focused on conservation and efficiency efforts, particularly in the built environment where electricity and natural gas make up almost 80% of emissions.
21. In 2010, Boulder collaborated with Boulder County, Denver, and Garfield County to apply for and receive $25 million in federal Better Buildings funding to roll out energy advising programs for residents and businesses. Since 2010, more than 7,500 City of Boulder housing units and 2,300 businesses have participated in energy upgrades resulting in over $20M in energy related private investments and significant reductions in emissions from building energy use.
22. Energy-related activities represent more than 95% of Boulder's emissions, encompassing three energy related emissions sources: electricity (coal and natural gas), natural gas for heating and other processes/uses, and petroleum. For those efforts, we look forward to the increasing availability of electricity from renewable sources under

Colorado's Renewable Portfolio Standards, one of the most stringent in the country. We also recognize more must be done.

23. These City programs and community action permitted Boulder to avoid 147,000 metric tons of emissions between 2005 and 2012, despite significant economic growth.
24. Boulder added more than 2,600 jobs and $529 Million in revenue in the 2005 to 2012 timeframe. A 2014 *NerdWallet* study ranked Boulder No. 1 in the country for economic growth. The study analyzed U.S. Census Bureau data for more than 500 of the largest American cities. In addition, Boulder was recently ranked #1 in the U.S. for workforce education levels in the poll of "Best Places for Business" by *Forbes.*
25. While efficiency and conservation efforts remain effective, it is essential that communities shift dependency away from fossil fuels and change the energy source.
26. Like most communities, the majority of Boulder's emissions come from burning fossil fuels to produce electricity.
27. Through the approval of multiple ballot measures between 2010 and 2013, Boulder voters directed the City to explore different options that could deliver safe, reliable, local and clean energy to the community.
28. Boulder is currently evaluating the legal, technical and financial feasibility of creating a locally owned electric utility through municipalization.
29. Boulder's municipalization effort is guided by an energy localization framework that is defined by three primary goals: Democratization, Decentralization and Decarbonization.
30. As such, local clean energy generation is a cornerstone of Boulder's long-term strategy. The City owns and operates eight hydroelectric facilities with the combined capacity of 15 megawatts. Boulder also has one of the highest levels of installed solar per capita in

the country, with more than 1,900 solar installations on Boulder homes and businesses with a current combined capacity of over 16 megawatts.

31. In response to increasing natural disasters in the region, including the flooding in Boulder, the Colorado Legislature passed HB13-1293 during its 2013 session, which declared that "climate change presents serious, diverse, and ongoing issues for the state's people, economy, and environment." Among other provisions, the bill required the governor to submit an annual report to a number of committees within the legislature "on climate change issues generally, the current climate action plan...and the specific ways in which climate change affects the state."
32. While Boulder is committed to reducing emissions, it is equally important to Boulder to ensure its resilience from climate-related impacts. Through its ongoing work with the Rockefeller Foundation and the Western Adaptation Alliance, Boulder continues to prioritize the critical linkages between mitigation and resilience building.
33. Boulder has established six near-term priorities for building resilience including efforts to:
    - Complete flood infrastructure design and implementation based on the experience of our recent 100 year+ flood event.
    - Update the design and infrastructure related to storm water, wastewater and drinking water, particularly in high flood/fire risk zones.
    - Increase fire hazard mitigation treatments, particularly in high vulnerability zones.
    - Continue to diversify transportation options to increase mobility and access, particularly for lower income residents.

- Expand “localized” energy such as distributed generation and micro-grid development to decrease vulnerability and increase stability and reliability of critical power systems during extreme weather or other disruption events starting first with critical community services such as public safety, public health, and basic governance functions.
- Identify cross-cutting opportunities between essential functions that prioritize resilience planning.

31. Recognizing that many other cities will continue to face similar challenges, Boulder is harmonizing its climate mitigation and adaptation strategies to grow technological, financial and social innovations that can be useful to others. For Boulder, growing mitigation and resilience efforts is a core theme in our future economic development strategy.

BOULDER’S SUPPORT FOR THE CLEAN POWER PLAN AND OPPOSITION TO STAYING THE RULE

34. On Aug. 3, 2015, President Obama unveiled the final Clean Power Plan, setting the first-ever national limits on carbon pollution from power plants — the nation’s largest source of these emissions, making clear that it is no longer acceptable to put unlimited amounts of climate pollution into our air.
35. The Clean Power Plan will reduce carbon emissions from power plants — and in doing so create new opportunities to continue development of the strong, vibrant clean energy economy that is creating prosperity, including in Boulder and other cities.
36. The third National Climate Assessment shows that cities will continue to bear the brunt of environmental, public health, and safety impacts associated with climate change;

therefore, Boulder has a significant interest in the outcome of the legal issues related to the Clean Power Plan—particularly in ensuring that EPA has the authority to promulgate flexible, nationwide standards to reduce carbon pollution, such as the Clean Power Plan standards under Section 111(d).

37. The Clean Power Plan and related actions will provide broad benefits and critical support to communities—in particular vulnerable communities like Boulder—across the nation by reducing carbon pollution from power plants and allowing communities to focus on efforts to build local resilience.

38. A stay of the Clean Power Plan could hamper the ability of the United States to argue for international reductions in emissions at the 2015 United Nations Conference of Parties in Paris and undermine efforts to implement commitments made at those talks. Allowing the rule to take effect shows the world that the United States is committed to leading global efforts to address climate change.

39. For this reason, the City has joined other cities and counties that are part of the Local Climate Leaders Circle, a group of local elected officials that will be in Paris for the climate negotiations, in sending a letter to EPA expressing opposition to requests for administrative stays of the Clean Power Plan. A copy of that letter is attached to this declaration as Exhibit A.

40. Because of the urgent threats to the City and our region posed by climate change, the City stands in strong opposition to any requests that the EPA's Clean Power Plan rule be stayed during the period of litigation.

Under penalty of perjury under the laws of the United States, I hereby declare that the foregoing facts are true and correct.



By: _____

Suzanne Jones

Mayor

EXHIBIT A

Mayor Matt Appelbaum,
Boulder, CO

Mayor Ralph Becker
Salt Lake City, UT

Mayor Frank Cownie
Des Moines, IA

Mayor George Heartwell
Grand Rapids, MI

Mayor Jeri Muoio
West Palm Beach, FL

Council Member Pam O'Connor
Santa Monica, CA

Mayor Bill Peduto
Pittsburgh, PA

Council Chair Larry Phillips
King County, WA

Mayor Mary Casillas Salas
Chula Vista, CA

Mayor Libby Schaaf
Oakland, CA

November 5, 2015

Administrator Gina McCarthy
US Environmental Protection Agency
Washington, DC

Administrator McCarthy:

As members of the Local Climate Leaders Circle, a group of mayors and elected officials traveling to Paris to press for necessary climate action at this year's UNFCCC Conference of Parties, we wish to express our deep concern over the current and growing threat that climate change poses to not only our own communities, but to those across the United States. We also wish to express our strong support for the EPA's Clean Power Plan and our desire to see it implemented without delay.

Cities are on the frontlines of climate change. It is cities and city leadership that most directly deal with the negative impacts of drought, flooding, wildfires, heatwaves, and other extreme weather events - impacts which science says will only be exacerbated by a warming world. Over time, climate change is expected to cause increased and lasting harm to public safety, local economies, and the critical natural resources upon which our communities depend. Data reported by the National Centers for Environmental Information show 88 extreme weather events over the past decade that resulted in damages over $1 billion. Over the last four years, extreme weather has cost our country $227 billion in economic losses. It is cities that most often bear the brunt of these costs and face the challenges of recovering and rebuilding from them.

Cities are also centers of climate change innovation. Hundreds of our fellow mayors and city leaders from around the country are working to develop practical, local solutions to address climate change – both to reduce emissions of harmful greenhouse gases and to protect our citizens and our communities from their effects. In many cases, cities have put in place plans that are more ambitious than those being considered at the state or national level. To succeed in reaching these goals, we also rely on leadership and strong policy signals from Washington, DC.

EXHIBIT A

This is why we applaud the positive leadership demonstrated by the Administration's Climate Action Plan and the strong step taken by EPA in issuing its final Clean Power Plan. Successful, nationwide implementation of EPA's plan to limit carbon pollution from power plants is the most important action our country can take at the moment to achieve the United States' greenhouse gas emissions reduction targets, announced in March 2015. Combined with steps the Administration is taking to limit other sources of greenhouse gas emissions, including fuel economy standards, energy efficiency standards for appliances and equipment, and incentives promoting renewable energy, the Clean Power Plan is a critical step towards building a clean energy-driven economy that can power our cities and prevent the worst impacts of climate change from threatening our communities.

The Clean Power Plan also provides the foundation for U.S. credibility and leadership on the global response to climate change. This December, leaders from around the world will gather in Paris to forge a collective response to climate change in a new international agreement. The members of the Local Climate Leaders Circle, along with our fellow mayors from cities around the world, will also be in Paris to advocate for an aggressive outcome, one that moves toward the trajectory the science calls for to protect our communities and further supports action at the local level. We are well aware that the severity of the challenges that cities such as Atlanta and Salt Lake City and West Palm Beach will face in the future could well be determined by what happens in Paris this fall.

We believe that any delay in implementing the Clean Power Plan will considerably undermine the ability of the U.S. to negotiate with other countries for a meaningful agreement in Paris. In fact, opponents of the Clean Power Plan have explicitly acknowledged this nexus as among their primary motivations to push for a stay of the rule in advance of Paris – i.e. to derail the talks and prevent an agreement from being achieved.

The United States is in a strong negotiating position this year, because it is backed by Administration accomplishments in adopting carbon reducing policies, of which the Clean Power Plan is a cornerstone. Indeed, the announcement of the Clean Power Plan has already contributed to breakthrough agreements between the U.S. and China resulting in unprecedented commitments to action from the Chinese government and unprecedented cooperation between the world's two largest emitters of carbon pollution. Among these breakthroughs are new commitments by Chinese cities to begin cutting emissions as many as ten years ahead of their national government, announced during a conference hosted by the Mayor of Los Angeles earlier this fall. It has taken five years of planning in the international process to get to this critical moment when a successful outcome is achievable. Strong U.S. leadership and a credible U.S. contribution are prerequisites for such a successful outcome. If we miss this window of opportunity, it may well take another five years to set the stage – time which the science makes clear we simply do not have if we hope to avert the worst impacts of climate change.

We believe, as the President stated when announcing the Clean Power Plan, that "there is such a thing as being too late." Were the Clean Power Plan to merely appear to the international community to be jeopardized, such as by a stay, the United States position would be significantly weakened. Without a strong United States position, other nations could pull back, including but not limited to China. A stay of the Clean Power Plan would cause significant and irreparable harm to the U.S. position, thus hampering the likelihood that the international process will reach an adequate agreement. As a result, U.S. cities and towns will face increased risks associated with the severity and the costs of future climate change impacts.

EXHIBIT A

For the sake of our communities and our country, we strongly support the actions the Administration is taking to ensure the United States does its part to reduce greenhouse gas emissions, including the Clean Power Plan, and strongly oppose efforts to stay, delay or block those actions, particularly at this critical moment.

Sincerely,



Mayor Matt Appelbaum
Boulder, CO



Mayor Ralph Becker
Salt Lake City, UT



Mayor Frank Cownie
Des Moines, IA



Mayor George Heartwell
Grand Rapids, MI



Mayor Jeri Muoio
West Palm Beach, FL



Council Member Pam O'Connor
Santa Monica, CA



Mayor Bill Peduto
Pittsburgh, PA



Council Chair Larry Phillips
King County, WA



Mayor Mary Casillas Salas
Chula Vista, CA



Mayor Libby Schaaf
Oakland, CA

ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al., Petitioners, **v.** **United States Environmental Protection Agency, et al.,** Respondents.	Case No. 15-1363

DECLARATION OF PHILIP K. STODDARD

I, Philip K. Stoddard declare as follows:

1. I am the Mayor of the City of South Miami, located in Miami-Dade County, Florida and I have first-hand knowledge of the facts set forth below or I have noted the source of the facts.

2. The City of South Miami is home to ~14,000 residents, and a thriving downtown commercial area on US-1, serviced directly by Metrorail link to downtown Miami and the Miami International Airport.

3. The City of South Miami (hereafter "the City"), like all of South Florida, faces an existential threat from sea level rise that is exacerbated by continued climate change. The City of Miami Beach is experimenting with a new design, featuring a street and sidewalk perched on an upper tier, 2 ½ feet above the

front doors of roadside businesses, and backed by a hulking nearby pump house, representing what one city engineer called "the street of tomorrow." These infrastructure changes come with an enormous price tag, as much as $500 million to install 80 pumps and raise roads and seawalls across the city. Hotels are already seeing the effects with visitors cancelling reservations or cutting vacations short after heavy flooding along Miami Beach. Residents' cars are severely damaged by saltwater. These impacts will only increase for the businesses that rely on tourist dollars. Overhauling major flood canal gates and pumps along the Miami-Dade coast will be costlier. In the long term, the prospect of raising homes, roads, and buildings is estimated to run into billions of dollars.[1]

4. The City of South Miami is located one-mile west of Biscayne Bay, and bounded by a major canal on the southern edge that connects directly to Biscayne Bay, and bisected by a second canal that connects to the first one. While the City of South Miami is not directly on Biscayne Bay, the City's canal areas are extremely low in elevation, already contained within FEMA flood zones, prone to storm flooding, and destined to become increasingly vulnerable to riverine flooding and storm surge as sea level continues to rise.

[1] http://www.miamiherald.com/news/local/community/miami-dade/miami-beach/article41141856.html

5. According to data recorded by the Rosenstiel School of Marine and Atmospheric Science (RSMAS) at the University of Miami, Biscayne Bay has experienced almost five inches of sea level rise in the past five years alone.

6. In 2015, the City hired a consultant to assess and identify critical vulnerabilities in regards to sea level rise, storm surge and inland riverine flooding, and the effect on infrastructure to the City of South Miami. The study revealed increasing vulnerabilities to septic systems, roads, bridges, and residential properties.

7. Ongoing threats to the City from the rising water table include slowed drainage during and following rains, increased flood risk, saltwater intrusion into our groundwater and soils, displacement of our drinking water supply, failure of residential septic systems.

8. Increased area flooding from sea level rise will require the City to install additional sewage infrastructure to allow for replacement of all septic systems with municipal sewer system (currently 2/3 of residences are on septic).

9. Increased flood threat caused by sea level rise will require the City to elevate roads in low-lying areas and to rebuild all bridges both higher and with greater clearance to handle flood waters.

10. Increased area flooding from sea level rise promises to directly disrupt regional transportation and commerce, threatening jobs, education systems, and the tax base that supports local government.

11. Increased area flooding from sea level rise promises to harm the City by interfering with finance markets, specifically, increasing the costs of private insurance, hindering the ability of local home-buyers to obtain 30-year mortgages, and preventing local government from bonding necessary infrastructure projects.

12. Flooding of low-lying residential neighborhoods will require the City to condemn properties, demolish homes, and restore these areas to function as estuaries and parks so as to avoid slum and blight that will harm the rest of the City.

13. Change in finance markets and loss of low-lying neighborhoods (currently holding the highest home valuations of any in the City), will harm the City's tax base and interfere with the City's ability to provide municipal services including police protection and parks programs.

14. Increased temperatures from global warming are already being experienced locally, extending the seasonal demand for air conditioning, and placing an additional financial burden on area residents.

15. Miami-Dade County has two existing nuclear power plants which are 42 years old[2] and are situated 20 feet above sea level[3] while some emergency backup infrastructure is lower. In Florida Power and Light's ("FPL") 2012 filing with the Nuclear Regulatory Commission ("NRC") for the purpose of building two new nuclear reactors, FPL revealed that low level nuclear waste will eventually require 24,000 square feet of on-site storage space and that FPL's plan for extended storage of low level nuclear waste will not provide sufficient physical safety measures to cope with an aquatic environment due to sea level rise. The experts for Citizens Allied for Safe Energy, Inc. ("CASE") found that it would not be feasible for FPL to elevate the auxiliary extended nuclear waste storage structures. The storm surge potential at Turkey Point is estimated at 10 to 20 feet (3 to 6 meters) for a major hurricane. According to the CASE, a storm surge at 28 feet above the current mean low tide line could be experienced with sea level rise over the next 60 years.[4] The City of South Miami is approximately 15 miles from the Turkey Point nuclear reactors and the city is very vulnerable to nuclear contamination and a meltdown of the reactors cause by a storm surge.

16. The City of South Miami, as well as much of South Florida, sits on very porous rock and, as the level of the sea rises, the pressure will cause water to

[2] http://www.nrc.gov/info-finder/reactor/tp3.html and http://www.nrc.gov/info-finder/reactor/tp4.html
[3] http://eyesontherise.org/app/ an application created by Florida International University.
[4] http://pbadupws.nrc.gov/docs/ML1116/ML1203/ML12034A220.pdf

rise up through the ground and flood the inland areas. The City of South Miami is experiencing higher levels of flooding, which translate into less ability for stormwater to drain into the ocean through the floodwater canal system in the City. The low lying areas within the City of South Miami are prone to flooding, evidenced by their inclusion in FEMA Flood Zone AE, which is defined as areas inundated by the 100-year flood. In particular, the Twin Lakes area of South Miami has experienced flooding, which has been increasing in frequency and intensity.[5]

17. The City of South Miami has begun both Adaptation and Mitigation strategies to address the consequences of climate change induced sea level rise.

18. The City's Comprehensive Plan limits construction in flood zones.

19. The City completed a Storm Water Master Plan and updated that plan in 2012.

20. The City has budgeted and spent millions of dollars to reduce the City's storm threat rating through drainage improvements in the lowest areas of the City.

21. This year, funding for City drainage improvement and sewer upgrades was allocated directly to the City by the State Legislature but the City's line-items

[5] http://www.southmiamifl.gov/documentcenter/view/158

were vetoed by Governor Scott, placing the financial burden directly on City residents.

22. Notwithstanding the governor's veto of state funding, the City has begun implementation of numerous drainage, sewer and stormwater management projects to alleviate the results of sea level rise, one of which is the allocation of up to $187,030 [6] towards the construction of the Twin Lakes Roadway & Drainage Improvements.[7]

23. The City has initiated engineering studies to replace residential septic systems with municipal sewer hookups that will be less vulnerable to failure caused by sea level rise-mediated flooding and rise in the water table.

24. City residents pay the bulk of their property taxes to Miami-Dade County, which has begun a multi-billion-dollar redesign of the entire County-wide sewer system, desalination projects to provide drinking water, and a groundwater modeling study.

25. The City has initiated a series of Climate Mitigation projects including initiatives for financing and group pricing on rooftop solar installations, green fleet conversion, and plans to replace energy-inefficient municipal buildings with more efficient ones. The rate of solar adoption has doubled, with residents reporting high return on investment. The City's green fleet initiative has already returned

[6] http://www.southmiamifl.gov/documentcenter/view/1411
[7] http://www.miamiherald.com/news/local/community/miami-dade/miami-beach/article41141856.html

budget savings. The City recognizes that the Clean Power Plan will provide additional incentives for renewable energy and other mitigation measures, consistent with the City's own initiatives.

26. The City recognizes that greenhouse gas emissions from human activity have been proven by the best science to be heating the oceans and atmosphere, accelerating sea level rise, and acidifying the oceans.

27. On May 1, 2012, the City Commission unanimously approved a Resolution # 91-12-13648, which instructed the City to send a letter to EPA Administrator Lisa P. Jackson, supporting the EPA's increased efforts to reduce greenhouse gas pollution under the Clean Air Act, a copy of that resolution is attached as **Exhibit A**.

28. On October 6, 2015, the City of South Miami unanimously passed Resolution # 167-15-14506 expressing its strongest supporting the EPA's Clean Power Plan as a way of significantly reducing greenhouse gas emissions that threaten the City through climate change and sea level rise. A copy of Resolution # 167-15-14506 is attached as **Exhibit B**.

29. The City has joined other cities and counties in South Florida facing similar global-warming-related threats in sending a letter to the EPA expressing opposition to requests for administrative stays of the Clean Power Plan. A copy of that letter is attached to this declaration as **Exhibit C**.

30. Because of the urgent threats to the City and our region posed by sea level rise, the City stands in strong opposition to any requests that the EPA's Clean Power Plan be stayed during the period of legal challenge or litigation.

Under penalty of perjury under the laws of the United States, I hereby declare that the foregoing facts are true and correct.

By:

PHILIP K. STODDARD
MAYOR

EXHIBIT A

EXHIBIT A

RESOLUTION NO: 91-12-13648

A Resolution of the City of South Miami to the Environmental Protection Agency Administrator Lisa P. Jackson in support of reducing greenhouse gas pollution under the Clean Air Act.

WHEREAS, the decade from 2000 to 2010 was the warmest on record[1], and 2005 and 2010 tied for the hottest years on record[2]; and

WHEREAS, the current level of CO_2 in the atmosphere is approximately 392 parts per million[3] (ppm); and

WHEREAS, one of the world's leading climate scientists, Dr. James Hansen, stated in 2008: "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and climate change suggest that CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm[4]; and

WHEREAS, the Environmental Protection Agency determined that current and future greenhouse gas concentrations endanger public health[5], and according to the Global Humanitarian Forum climate change is already responsible every year for some 300,000 deaths, 325 million people seriously affected, and economic losses worldwide of U.S. $125 billion[6]; and

WHEREAS, eextreme weather events, most notably heat waves and precipitation extremes, are striking with increased frequency[7], with deadly consequences for people and wildlife; in the United States in 2011 alone, a record 14 weather and climate disasters occurred, including droughts, heat waves, and floods, that cost at least $US 1 billion each in damages and loss of human lives[8]; and

WHEREAS, climate change is affecting food security by lowering the growth and yields of important crops[9], and droughts, floods and changes in snowpack are altering water supplies[10]; and

WHEREAS, scientists have concluded that by 2100 as many as a tenth of all species may be on the verge of extinction due to climate change[11]; and

WHEREAS, the world's land-based ice is rapidly melting, threatening water supplies in many regions and raising sea levels[12], and Arctic summer sea ice extent has decreased to about half what it was several decades ago[13], with an accompanying drastic reduction in sea-ice thickness and volume[14], which is severely jeopardizing ice-dependent animals[15]; and

WHEREAS, sea level is rising faster along the U.S. East Coast than it has for at least 2,000 years[16], is accelerating in pace[17], and could rise by one to two meters in this century, threatening millions of Americans with severe flooding[18]; and

WHEREAS, for four decades, the Clean Air Act has protected the air we breathe through a proven, comprehensive, successful system of pollution control that saves lives and creates economic benefits exceeding its costs by many times[19]; and

WHEREAS, with the Clean Air Act, air quality in this country has improved significantly since 1970, despite major growth both in our economy and industrial production; and

WHEREAS, between 1970 and 1990, the six main pollutants covered by the Clean Air Act — particulate matter and ground-level ozone (both of which contribute to smog and asthma), carbon

monoxide, lead, sulfur and nitrogen oxides (the pollutants that cause acid rain) — were reduced by between 47 percent and 93 percent, and airborne lead was virtually eliminated; and

WHEREAS, the Clean Air Act has produced economic benefits valued at $2 trillion, equivalent to 30 times the cost of regulation; and

WHEREAS, the U.S. Supreme Court ruled in *Massachusetts vs. EPA* (2007) that greenhouse gases are "air pollutants" as defined by the Clean Air Act and the Environmental Protection Agency has the authority to regulate them; and

WHEREAS, climate change threatens to put much of South Florida underwater in the next century; and

WHEREAS, The City of South Miami prides itself on being a leader in the fight against climate change and for clean air, having signed the Mayors' Climate Protection Agreement, and working to promote tree canopy;

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COMMISSION OF THE CITY OF SOUTH MIAMI, FLORIDA:

Section 1. Climate change is not an abstract problem for the future or one that will only affect far-distant places but rather climate change is happening now, we are causing it, and the longer we wait to act, the more we lose and the more difficult the problem will be to solve; and we, the City of South Miami Commission, on behalf of the residents of the City, do hereby urge the administrator of the Environmental Protection Agency, Lisa P. Jackson, and President Barack Obama to move swiftly to fully employ and enforce the Clean Air Act to do our part to reduce carbon in our atmosphere to no more than 350 parts per million.

Section 2. The City Clerk shall forward a copy of this resolution to Lisa P. Jackson of the Environmental Protection Agency and President Barack Obama.

Section 3. This Resolution shall take effect upon adoption.

Passed and adopted this 1st day of May 2012.

ATTEST:

CITY CLERK

APPROVED:

MAYOR

COMMISSION VOTE:	5-0
Mayor Stoddard:	Yea
Vice Mayor Liebman:	Yea
Commissioner Newman:	Yea
Commissioner Harris:	Yea
Commissioner Welsh:	Yea

READ AND APPROVED AS TO FORM LANGUAGE, LEGALITY AND EXECUTION THEREOF:

CITY ATTORNEY

ENDNOTES

[1] Press Release, National Aeronautic Space Association, *NASA Research Finds Last Decade was Warmest on Record, 2009 One of the Warmest Years* (Jan. 21, 2010), www.nasa.gov/home/hqnews/2010/jan/HQ_10-017_Warmest_temps.html.

[2] National Oceanic and Atmospheric Administration, *NOAA: 2010 Tied for Warmest Year on Record,* www.noaanews.noaa.gov/stories2011/20110112_globalstats.html (last visited on 3/30/12).

[3] Co2now.org, *What the World Needs to Watch*, http://co2now.org (last visited on 3/30/12); Earth System Research Laboratory of NOAA, *Trends in Atmospheric Carbon Dioxide,* www.esrl.noaa.gov/gmd/ccgg/trends/ (last visited on 4/2/12).

[4] J. Hansen et al., *Target atmospheric CO_2: Where should humanity aim?*, Open Atmos. Sci. 2, 217 (2008), http://pubs.giss.nasa.gov/abs/ha00410c.html.

[5] U.S. Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*, 74 Federal Register 66496-66546 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. 1), http://epa.gov/climatechange/endangerment.html (last visited 4/2/12).

[6] Global Humanitarian Forum, *The Anatomy of a Silent Crisis* (2009), www.eird.org/publicaciones/humanimpactreport.pdf, p.1 of pdf.

[7] Intergovernmental Panel on Climate Change (IPCC), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)* (2012), http://ipcc-wg2.gov/SREX/; U.S. Global Change Research Program, *Global Climate Change Impacts in the US: Global Climate Change* (2009), http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/full-report/global-climate-change; D. Coumou and S. Rahmstorf, *A decade of weather extremes,* Nature Climate Change (2012), http://dx.doi.org/10.1038/NCLIMATE1452.

[8] National Oceanic and Atmospheric Administration, *Extreme Weather 2011,* http://www.noaa.gov/extreme2011/ (last visited April 2, 2012); Press Release, World Meteorological Organization, *2011: world's 10th warmest year, warmest year with La Niña on record, second-lowest Arctic sea ice extent* (2012), www.wmo.int/pages/mediacentre/press_releases/gcs_2011_en.html.

[9] D.B. Lobell et al., *Climate Trends and Global Crop Production Since 1980*, Science 333, 616 (July 29, 2011), www.sciencemag.org/content/early/2011/05/04/science.1204531.abstract; U.S. Global Change Research Program, *Global Climate Change Impacts in the US: Agriculture* (2009), www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/full-report/climate-change-impacts-by-sector/agriculture.

[10] U.S. Global Change Research Program, *Global Climate Change Impacts in the US: Water Resources* (2009), www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/full-report/climate-change-impacts-by-sector/water-resources.

[11] I.M.D. Maclean and R.J. Wilson, *Recent ecological responses to climate change support predictions of high extinction risk,* PNAS 108, 12337 (2011), http://www.pnas.org/content/108/30/12337, summary at http://www.sciencedaily.com/releases/2011/07/110711151457.htm.

[12] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report* (2007), http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm, pp. 30, 49 of pdf.

[13] J. Stroeve et al., *Arctic Sea Ice Extent Plummets in 2007*, EOS 89, 2 (January 8, 2008), http://www.agu.org/pubs/crossref/2008/2008EO020001.shtml, p. 13 of pdf.

[14] Polar Science Center, *Arctic Sea Ice Volume Anomaly, version 2*, http://psc.apl.washington.edu/wordpress/research/projects/arctic-sea-ice-volume-anomaly/ (last visited April 3, 2012); R. Kwok and D.A. Rothrock, *Decline in Arctic sea ice thickness from submarine and ICESat records: 1958-2008*, Geophysical Research Letters 36, L15501 (2009), http://www.agu.org/pubs/crossref/2009/2009GL039035.shtml.

[15] Center for Biological Diversity and Care for the Wild International, *Extinction: It's Not Just for Polar Bears* (2010), http://www.biologicaldiversity.org/programs/climate_law_institute/the_arctic_meltdown/arctic_extinction_report.html.

[16] A.C. Kemp et al., *Climate related sea-level variations over the past two millennia,* PNAS 108, 11017 (2011), http://www.pnas.org/content/108/27/11017, summary at http://www.sciencedaily.com/releases/2011/06/110620183242.htm.

[17] M.A. Merrifield et al., *An Anomalous Recent Acceleration of Global Sea Level Rise*, Journal of Climate 22, 5772 (2008), http://journals.ametsoc.org/doi/abs/10.1175/2009JCLI2985.1.

[18] B.H. Strauss, *Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States,* Environmental Research Letters 7 (2012), http://iopscience.iop.org/1748-9326/7/1/014033, summary at http://www.sciencedaily.com/releases/2012/03/120314111738.htm.

[19] For Clean Air Act facts, see
Center for Biological Diversity, *The Clean Air Act Works* (2011), http://www.biologicaldiversity.org/programs/climate_law_institute/global_warming_litigation/clean_air_act/pdfs/CleanAirActWorks_032011.pdf; and
U.S. Environmental Protection Agency, *The Benefits and Costs of the Clean Air Act, 1970 to 1990* (1997), http://www.epa.gov/air/sect812/; and
U.S. Environmental Protection Agency, *The Benefits and Costs of the Clean Air Act, 1990 to 2010* (1999), http://www.epa.gov/air/sect812/.

EXHIBIT B

EXHIBIT B

RESOLUTION NO. 167-15-14506

A Resolution of the City of South Miami, Florida, ("City") supporting the EPA's Clean Power Plan rule as a way of significantly reducing greenhouse gas emissions that threaten the South Florida region through climate change and sea level rise and opposing any requests that the Clean Power Plan rule be stayed during any periods of legal challenge or litigation and authorizing Mayor Stoddard to issue a Declaration in support of this Resolution.

WHEREAS, The Mayor and City Commission recognize that greenhouse gas emissions from human activity have been proven by the best science to be heating the oceans and atmosphere, accelerating sea level rise, and acidifying the planet's oceans; and

WHEREAS, all of South Florida, including the City of South Miami, is threatened existentially by sea level rise induced by global warming; and

WHEREAS, On May 1, 2012, the City Commission unanimously approved a resolution sending a letter to U.S. Environmental Protection Agency (EPA) Administrator Lisa P. Jackson, supporting the EPA's increased efforts to reduce greenhouse gas pollution under the Clean Air Act; and

WHEREAS, On August 3, 2015, the President and EPA announced the Clean Power Plan - http://www2.epa.gov/cleanpowerplan/clean-power-plan-final-rule ; and

WHEREAS, the Clean Power Plan is a historic and important step in reducing carbon pollution from power plants, and one that takes real action to limit human-induced climate change; and

WHEREAS, the Clean Power Plan was shaped by years of unprecedented outreach and public engagement, resulting in a fair, flexible plan, designed to strengthen the fast-growing trend toward cleaner and lower-polluting American energy with strong but achievable standards for power plants, and customized goals for states to cut the carbon pollution that is driving climate change; and

WHEREAS, the Clean Power Plan provides national consistency, accountability, and a level playing field, while reflecting each state's energy mix; and

WHEREAS, the Clean Power Plan furthers international cooperation on stemming climate change by showing other nations that the United States is committed to leading global efforts to address climate change.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND CITY COMMISSION OF THE CITY OF SOUTH MIAMI, FLORIDA, THAT:

Section 1. The above recitals are found to be true and correct and are hereby adopted by reference as if incorporated and set out in full in this resolution.

Section 2. The City Commission hereby expresses its strongest support for the federal Clean Power Plan rule and strongly opposes any and all requests that the Clean Power Plan rule be stayed during any periods of legal challenge or litigation. Mayor Philip K. Stoddard is hereby authorized to sign the attached Declaration on behalf of the City of South Miami opposing any and all petitions/motions to stay the implementation of the Clean Power Plan.

Section 3. The City Clerk is hereby directed to convey this resolution to EPA Secretary Gina McCarthy, and individually to all United States and Florida State Legislators representing the City of South Miami, to the Miami-Dade County Mayor, to members of the Miami-Dade County Commission, and to all cities in Miami-Dade County.

Section 4. If any section clause, sentence, or phrase of this resolution is for any reason held invalid or unconstitutional by a court of competent jurisdiction, the holding shall not affect the validity of the remaining portions of this resolution.

Section 5. This resolution shall take effect immediately upon adoption.

PASSED AND ADOPTED this 6th day of October, 2015.

ATTEST:

CITY CLERK

APPROVED:

MAYOR

READ AND APPROVED AS TO FORM, LANGUAGE, LEGALITY AND EXECUTION THEREOF

CITY ATTORNEY

COMMISSION VOTE:	4-0
Mayor Stoddard:	Yea
Vice Mayor Harris:	Absent
Commissioner Edmond:	Yea
Commissioner Liebman:	Yea
Commissioner Welsh:	Yea

EXHIBIT C

EXHIBIT C

Joni Armstrong Coffey
County Attorney

BROWARD COUNTY FLORIDA

OFFICE OF THE COUNTY ATTORNEY
115 S. Andrews Avenue, Suite 423
Fort Lauderdale, Florida 33301

954-357-7600 · FAX 954-357-7641

December 4, 2015

Gina McCarthy
EPA Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: Clean Power Plan Rule

Dear Administrator McCarthy:

We, the elected representatives of Southeast Florida listed below, write to you to express our strong support for the Clean Power Plan, the new Environmental Protection Agency ("EPA") rule restricting power plant carbon dioxide emissions pursuant to § 111(d) of the Clean Air Act, 42 U.S.C. § 7411(d). The rule is critical to the citizens of Florida. Any delay in implementing the rule poses a serious threat to the health, safety, and welfare of our residents.

We believe the Clean Power Plan, which will reduce greenhouse emissions from fossil-fueled power plants, will mitigate the harm that climate change is having on Florida's fragile environment and vulnerable communities. That harm includes damaged coastal areas, disrupted ecosystems, more severe weather events, and longer and more frequent droughts.

No other state is more threatened by climate change than Florida, surrounded on three sides by the Gulf of Mexico and the Atlantic Ocean, crisscrossed by rivers and speckled with lakes. Southeast Florida is particularly vulnerable to the predicted effects of climate change due to its extensive coastline, flat landscape, porous geology, and burgeoning coastal development. Likely climate change scenarios for the region indicate that reductions in rainfall and rising sea levels, which cause saltwater contamination, will tax the available freshwater supply. Most pressingly, scientists at the University of Miami have measured sea-level rise locally, finding that the sea level has risen about 0.97" per year over just the past five years.

In South Florida, Miami-Dade, Broward, and Palm Beach counties collectively have populations approaching six million residents. Millions of these residents live on or near the shoreline. Their safety depends on thousands of miles of canals for drainage and

Broward County Board of County Commissioners
Mark D. Bogen • Beam Furr • Dale V.C. Holness • Martin David Kiar • Chip LaMarca • Stacy Ritter • Tim Ryan • Barbara Sharief • Lois Wexler
broward.org/legal

EXHIBIT C

flood control. Local governments take this threat seriously. In January 2010, elected officials from Broward, Miami-Dade, Monroe, and Palm Beach Counties came together to execute the Southeast Florida Regional Climate Change Compact to coordinate mitigation and adaptation activities across county lines. The Compact has led to joint policies to influence climate and energy legislation, funding at state and federal levels, development of a Regional Climate Change Action Plan, and a technical foundation for regional climate issues.

Nevertheless, extreme high tides have become increasingly frequent and dramatic due to rising sea levels, over-topping seawalls, pushing up through storm water systems and contributing to flooding in communities far from the waterfront and coastal canals. King tides, the very highest tides, earlier this year were more severe and expansive than measured during any storm event in the last 20 years even though there was no accompanying rain. Emergency evacuation routes were flooded and businesses closed their doors in Broward County.

On Miami Beach, the City is experimenting with a new design featuring a street and sidewalk perched on an upper tier, 2 ½ feet above the front doors of roadside businesses, and backed by a hulking nearby pump house. This represents what one city engineer called "the street of tomorrow." This comes with an enormous price tag as much as $500 million to install 80 pumps and raise roads and seawalls across the city. Hotels are already seeing the effects with visitors cancelling reservations or cutting vacations short after heavy flooding along Miami Beach. Residents' cars are severely damaged by saltwater. These impacts will only increase for the businesses that rely on tourist dollars. Overhauling major flood canal gates and pumps along the Miami-Dade coast will be costlier. In the long term, the prospect of raising homes, roads, and buildings is estimated to run into billions of dollars.[1]

In Fort Lauderdale, extreme high tides are damaging property and infrastructure and hastening beach erosion. In November 2012, extreme high tides, coupled with a persistent onshore wind, contributed to severe sand loss and beach scouring, battering 2,300 feet of shoreline and causing four blocks of State Road A1A, an emergency evacuation route, to collapse into the sea. Temporary and permanent reconstruction costs exceeded $10 million.

In the City of Coral Gables this past spring, the Community Recreation Department was puzzled by failed efforts to regrow turf on athletic fields. The protocols that were used just the previous year were checked and rechecked, yet turf would not grow. Eventually, the wells were tested and found to contain saltwater intrusion. The U.S. Geological Survey ("USGS") monitors the wells and found that the City's wells' chloride

[1] http://www.miamiherald.com/news/local/community/miami-dade/miami-beach/article41141856.html

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concentrations have been increasing. The city ultimately switched to the municipal water system which has increased cost in an amount that is yet unknown. Also and similarly to many South Florida counties and municipalities, Coral Gables is experiencing increased frequency of street flooding.

The City of South Miami, which abuts the City of Coral Gables, is about one-mile west of Biscayne Bay and bounded by a major canal on the southern edge that connects directly to Biscayne Bay, and is bisected by a second canal. The City's canal areas are extremely low in elevation, already contained within FEMA flood zones, prone to storm flooding, and destined to become increasingly vulnerable to riverine flooding and storm surge as sea level continues to rise. The City has already experienced almost five inches of sea level rise in the past five years alone. A recent study to assess and identify critical vulnerabilities regarding sea level rise and its effects on storm surge and inland riverine flooding, and the effect on infrastructure to the City of South Miami, has revealed an increasing vulnerability by septic systems, roads, bridges, and residential properties.

Due to the porous nature of the coral rock that is the City's foundation, the rising sea level is causing an elevation of the City's water table. This results in slowed drainage during and following rains, increased flood risk, saltwater intrusion into groundwater and soils, and the failure of residential septic systems (currently 2/3 of residences are on septic). As the sea level rises, the City will need to elevate its roads in low-lying areas and rebuild all bridges with greater clearance to handle flood waters.

The City of South Miami is attempting to do its part in combating climate change by initiating a series of Climate Mitigation Projects including initiatives to promote alternative sources of power, including solar installations, green fleet conversion, and plans to replace energy-inefficient municipal buildings.

Regionally, it has been estimated that $3 billion in property value is at risk with one foot of sea level rise. A storm surge could magnify this figure significantly. Rising sea levels threaten evacuation routes, energy infrastructure, freshwater wellfields, and water and wastewater infrastructure. Fort Lauderdale recently estimated that upgrades to the city's storm water system to combat rising sea levels would reach $1 billion.

Rising seas are driving saltwater contamination into wellfields. Models developed in collaboration with the U.S. Geological Survey (USGS) predict a loss of 35 million gallons per day in water supply capacity by 2060 (40% of Broward's coastal wellfield capacity), due entirely to sea level rise and saltwater contamination. These models characterized the wellfields operated by Broward County and the Cities of Deerfield Beach, Pompano Beach, Hollywood, Dania Beach, and Hallandale Beach. Pumps to replace gravity water control structures within the regional flood control system in Broward County alone are estimated to each cost $50 million. Existing pump systems are inadequate to handle the

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increase in pressure caused by sea-level rise. Modeling performed by the USGS indicates that by 2060, increases in groundwater level caused by rising seas will require an existing pump to run 24 hours a day to maintain flood control elevations.

Clearly, the effects of climate change on South Florida communities will require massive investments in clean energy and innovative engineering solutions in the coming decades. We believe that the EPA rules are a significant step in protecting our communities and addressing the extremely serious environmental challenges that we are facing.

We are aware that several states and industry groups have requested that EPA stay the Clean Power Plan during the upcoming litigation, and that parties to that litigation are making similar requests in court. As a result of the harms our communities are currently facing (and will face in the future) from climate change, we urge you to resist any attempts to stay the Clean Power Plan, which could delay the necessary cuts in carbon dioxide emissions to address these harms.

Sincerely,

Broward County Mayor Marty Kiar

Elected representatives who endorse this letter:

FOR CITY OF CORAL GABLES:

Mayor Jim Cason
Vice Mayor Frank Quesada
Commissioner Patricia Keon
Commissioner Vince Lago
Commissioner Jeannett Slesnick

FOR CITY OF MIAMI

Mayor Thomás Regalado

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FOR CITY OF SOUTH MIAMI

Mayor Philip K. Soddard
Vice Mayor Walter Harris
Commissioner Josh Liebman
Commissioner Gabriel Edmond
Commissioner Robert (Bob) Welsh

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

JOINT ADDENDUM:

Exhibits in Support of Movant Respondent-Intervenors' Responses in Opposition to Motions for Stay

Part B

Declarations in Support of Environmental and Public Health Intervenors

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

DECLARATION OF SUSAN F. TIERNEY, Ph.D.

I, Susan F. Tierney, declare as follows:

I. INTRODUCTION AND PURPOSE OF MY DECLARATION

1. I am a Senior Advisor at Analysis Group Inc., 111 Huntington Avenue, 10th Floor, Boston, Massachusetts, 02199, where I provide policy, economic and strategy consulting in the electric industry. I hold a Ph.D. in Regional Planning (1980) and Masters in Regional Planning (1976) from Cornell University.

2. I have worked for more than thirty years in areas relevant to the agency rulemaking at issue, including as a federal and state official with regulatory and policymaking responsibilities, as a university professor, and as a consultant to a variety of types of organizations. My professional work has involved: state utility, environmental, and energy-facility siting regulation; economic analysis of issues affecting electric utilities, wholesale power markets, and consumers' utility rates; reliability of the electric system; permitting, siting, and construction of electric and natural gas infrastructure; the design of environmental policies to control emissions of

air pollutants from the power sector; natural gas markets; the role of energy efficiency in energy markets; the implications of different kinds of regulation for costs to power producers and to consumers; and international climate agreements relating to energy systems.[1]

3. The purpose of my declaration is to provide information to the Court relating to two questions: whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Clean Power Plan, 80 Fed. Reg. 64,622 (Oct. 23, 2015); and whether the public interest is served by denying the requests for a stay.

4. Portions of my declaration are based on my direct experience as a former state cabinet officer responsible for air pollution control, as a former state utility regulator responsible for implementing state and federal statutes and regulations relating to electric utilities and power plants, and as former head of a state agency responsible for reviewing proposals to site electric generating units and transmission facilities. Among many other things, my state service included: responsibility for development and submission to the EPA of Massachusetts' State Implementation Plan, a process which involved working with other state agencies responsible for different elements of the state plan; working with other states to develop designs for certain air pollution control programs whose impacts affected other states (and vice versa); reviewing and approving proposals to site utility and non-utility energy infrastructure projects and contracts for power supply; and reviewing electric utility

[1] My biography and experience is further discussed in the appendix to this declaration.

resource plans.

5. Other portions of my statement are based on my extensive experience as a consultant to a wide variety of entities (including owners of power plants, state government agencies, grid operators, transmission companies, local distribution utilities, non-governmental organizations, electricity consumers, and others) on matters relating to utility and air regulation, power plant and transmission projects, and the costs, environmental impacts, and reliability of the electric power system.

6. Also, I base my conclusions on my prior experience as the Assistant Secretary for Domestic and International Energy Policy for the U.S. Department of Energy and on my involvement in clean energy initiatives affecting China, India, and other countries in the 20 years since I left government service.

7. I am supplying this declaration at the request of the public health and environmental movant-intervenors ("environmental movant-intervenors").

8. In preparation for this declaration, I have reviewed: (a) the Clean Power Plan; (b) EPA's proposed federal plan under the Clean Power Plan[2]; (c) the declarations attached to various stay motions; (d) declarations supporting the environmental movant-intervenors prepared by former Secretary of State Madeleine Albright, several former federal and utility regulators (Joseph Kelliher and Jon Wellinghoff (each formerly chair of the Federal Energy Regulatory Commission), Jeanne Fox of New Jersey, Larry Soward of Texas, Barbara Roberts of Colorado),

[2] 80 Fed. Reg. 64,966 (Oct. 23, 2015).

Drs. Dallas Burtraw and Joshua Linn, Tom Sanzillo, David Schlissel, and Eric Svenson. In addition, I have reviewed other documents cited in this declaration.

II. SUMMARY OF MY TESTIMONY

9. In my declaration, I rebut various parties' statements that they will suffer irreparable harm during the period of the Court's review of the merits in the absence of a stay. Many declarations filed on behalf of those seeking a stay assert that certain impacts of the Clean Power Plan are known with absolute certainty, when in reality there is great uncertainty about the impacts or outcomes they assert will occur. Many of these declarations describe impacts that are actually being driven by industry trends that are unrelated to the Clean Power Plan. Moreover, there would be tangible harms to individual entities other than the stay movants, and to the public interest, if a stay were imposed during the course of the Court's review.

10. In Section III, I rebut assertions made by many State Declarants[3] that the EPA's Clean Power Plan will cause them irreparable harm by requiring significant actions during the period of the Court's review. I conclude that the Clean Power Plan does not require a state to file any plan at all, and for those states electing to submit a plan, the Clean Power Plan provides a quite-streamlined option for them to request a two-year extension so that they can submit their plans by September 2018, rather than September 2016. For states that elect to submit plans, the Clean Power Plan requires determinations from state officials that are not meaningfully different from those state

[3] I use "State Declarants" to refer to the declarations of various state officials attached as Exhibit C to the State Petitioners' filings.

officials have had to make to develop plans under other parts of the Clean Air Act ("Act").

11. In Section IV, I respond to the claims of various State Declarants (e.g., officials from Texas) as well as the Oklahoma Declarants[4] that the Clean Power Plan will encroach upon their ability to shape the future structure and operations of the electric industry in their state and their autonomy to regulate electric utilities as they see fit. I conclude that the types of determinations that state agencies will need to make fall within the normal types of "business as usual" regulatory reviews that states exercise over electric utility companies.

12. In Section V, I answer the assertions of various declarants (e.g., the National Mining Association Declarants[5] and the Utility and Allied Group's Declarants[6]) that the Clean Power Plan will cause disruptive and harmful changes in the electric system, including their contentions that near-term power plant retirements will be required. I conclude that contrary to statements by various declarants, nothing in EPA's modeling results forces any firm to make near-term coal-plant retirement decisions or investments in replacement capacity. Given the lead times for planning and adding infrastructure and other electric resources, market participants in the electric industry will not have to make significant irreversible investment decisions until after the

[4] I use the phrase "Oklahoma Declarants" to respond to the state-specific filings of Oklahoma.
[5] I use the phrase "National Mining Association Declarants" to refer to those attached to the filings of the National Mining Association and individual coal companies.
[6] I use the phrase "Utility and Allied Group Declarants" to refer to those attached to the filings of the Utility Air Regulatory Group, American Public Power Association, et al.

Court's review of this matter on the merits. Further, a very substantial quantity of new electric generation resources is already in the development, permitting, and/or construction phase in response to market signals preceding the Clean Power Plan. In addition, a stay would not relieve investors or owners of power plants from taking the prospect of carbon regulation into account in their planning decisions.

13. In Section VI, I address the impacts of the Clean Power Plan on electric system reliability, an issue raised in most of the declarations filed on behalf of parties supporting a stay. I conclude that for a variety of reasons which I describe, the Clean Power Plan will not jeopardize reliability, either during the period of the Court's review, or leading up to or during the rule's implementation.

14. In Section VII, I address impacts on the coal industry and conclude that the impacts described in the National Mining Association Declarations are the result of market fundamentals, and will occur with or without the Clean Power Plan. Also, the claimed impacts on coal mines, local jobs, state taxes, and other revenues are inappropriately ascribed to the Clean Power Plan because it does not force specific plants to close, as those claims presume. Since those plant closings are not, in fact, forced by the Clean Power Plan, there is not a basis for assigning these claimed secondary impacts to the Clean Power Plan.

15. In Section VIII, I address the claims of many declarants (e.g., the State Declarants, as well as the Chamber of Commerce Declarants[7]) that there will be

[7] I use the phrase "Chamber of Commerce Declarants" to refer to those attached to the filings of the U.S. Chamber of Commerce et al.

irreparable harm to electricity consumers without a stay and upon the implementation of the Clean Power Plan. To the contrary, I conclude that several of the declarants exaggerate the price impacts on consumers in a number of ways. For the reasons I describe above and below, there will not be impacts on consumers during the period of a stay. Over the longer term, the costs associated with low-carbon sources of electricity are declining. Moreover, there are various compliance strategies that would end up lowering consumers' electricity use and, in turn, mitigating the impacts of carbon regulation on their electricity bills. Energy efficiency investments are one such compliance strategy that is permissible under the Clean Power Plan, even if the EPA declined to use it as a building block in setting emission-reduction targets.

16. Finally, in Section IX, I address the impacts of a stay on other aspects of the public interest, including negative impacts on the U.S. role in spurring actions by other countries to mitigate climate change.

III. CLEAN POWER PLAN OVERVIEW AND IMPACTS ON STATE AGENCIES

17. Contrary to statements made by various State Declarants,[8] the Clean Power Plan will not lead to irreparable harm in the absence of a stay during the period of the

[8] See, for example, the declarants from Texas (Richard Hyde from the Texas Commission on Environmental Quality, and Brian Lloyd from Texas Public Utility Commission). Contrary to the impression left by Mr. Hyde's list of things that need be done by September 2016 (Hyde Declaration, pages 11-12), some of these things are already being done (e.g., development of new generating capacity and maintenance of adequate power plant reserve margins). Other claims (e.g., statements about the "significant time, effort and resources" needed of state agencies before September 2016 (Hyde Declaration, pages 4-5; Lloyd Declaration, page 11)) are exaggerated and inconsistent with the plain language of the Clean Power Plan.

Court's review. As I describe further below, during that period, the efforts a state will need to undertake to comply with the 2018 deadline do not rise to the level of the kind of irreparable harm that movants allege, because (a) states do not have to submit a plan at all, and (b) there are already planning resources and capabilities in place to enable states that elect to submit a plan to do so with much less effort than claimed by State Declarants and the Oklahoma Declarants.

18. The Clean Power Plan does not obligate states to take immediate and burdensome actions, or indeed to act at all. It provides each state with the opportunity to develop a state plan to implement carbon-dioxide emission limits for fossil fuel-fired electric generating units. But states are not required to develop a state plan. If a state elects not to do so, then it is the EPA's responsibility to directly regulate the emissions of the power plants in that state. If a state does not submit a timely plan that EPA can approve, then Section 111(d) of the Clean Air Act provides for the EPA to issue a federal plan regulating the carbon-dioxide emissions of fossil-fueled power plants in that state. At any point, a state can avoid or supplant a federal plan by submitting an approvable state plan. This structure, known as "cooperative federalism," has been a prominent architectural feature of the Clean Air Act since 1970. In most instances over the past 45 years, states have elected to develop their own plans. In some situations, EPA has been required to implement a federal plan to directly regulate pollutant-emitting sources. A federal plan put in place in a state is superseded when a state adopts and submits a state plan and EPA approves it – although some states have opted to leave federal plans in place for long periods.

19. For states that elect to develop and submit their own state plans, the Clean

Power Plan provides three years to do so. Such a state must make an initial submittal by September 6, 2016. I anticipate that some states may submit a complete plan by that date. For example, Pennsylvania officials have already announced that that state intends to complete and submit its plan by September 6, 2016.[9] But any state may request a two-year extension, until September 6, 2018, to submit a complete plan, and I expect most states to do so. There is no adverse impact associated with requesting the extension. The criteria for requesting and obtaining an extension are very modest ("simple" and "readily achievable steps"), as the EPA explained not only in the Clean Power Plan itself, but also in an October 22, 2015 memorandum[10] to its Regional Air Directors (the EPA personnel responsible for providing direct assistance to the states as they prepare and submit plans or extension requests).

20. To request an extension, a state's initial September 2016 submission must include three elements.[11] The Clean Power Plan specifically states: "EPA is not

[9] Elizabeth Harball, "A Q&A with an official who hopes to be among the first to comply with the Clean Power Plan," *E&E News*, December 4, 2015 ("[T]he Wolf administration aims to submit a final plan to EPA in September 2016 rather than seeking a two-year extension."), available at http://www.eenews.net/stories/1060028979.

[10] Memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, EPA, "Initial Clean Power Plan Submittals Under Section 111(d) of the Clean Air Act," to Regional Air Directors, Regions 1-10, dated October 22, 2015.

[11] These three elements: "[a] An identification of final plan approach or approaches under consideration, including a description of progress made to date. [b] An appropriate explanation for why the state requires additional time to submit a final plan by September 6, 2018. [c] Demonstration or description of opportunity for public comment on the initial submittal and meaningful engagement with stakeholders, including vulnerable communities, during the time in preparation of the initial submittal and plans for engagement during development of the final plan." 80 Fed. Reg. at 64,856 (footnote omitted).

requiring the adoption of any enforceable measures or final decisions in order for the state to address any of the initial submittal components by September 6, 2016."[12] EPA states that it will grant extension requests if these three elements are included. EPA further indicates that states may obtain an extension based on "other appropriate explanations."[13] If EPA does not inform the state within 90 days that it cannot grant the extension, the extension will be deemed automatically approved.[14] As EPA states, the task of providing "an appropriate explanation for an extension is easily achievable by 2016."[15] It is plain that any state that desires more time to develop its state plan will be able to secure a two-year extension.

21. From my prior positions as a senior environmental and energy official in state and federal government agencies and as a consultant to groups around the U.S., I observe that every state has extensive experience conducting public processes and seeking public comment on proposed actions, including sponsoring formal stakeholder meetings, holding public hearings, and soliciting written comments. Given that experience, the requirement to engage the public as states begin to evaluate their options will not be burdensome. I note the declarations of many former public officials from energy, utility-regulatory, and environmental agencies – including those

[12] 80 Fed. Reg. at 64,856.
[13] *Id.*
[14] *Id.* at 64,858-59.
[15] *Id.* at 64,856.

of Jeanne Fox of New Jersey; Larry Soward of Texas; Barbara Roberts of Colorado; and Theresa Marks of Arkansas[16] – who have reached a similar conclusion.

22. In short, the required contents of a state's request by September 2016 for a two-year extension are quite minimal. Notably, many State Declarants[17] conflate what they need to do by 2016 with what is required of the 2018 plan (if they decide to file one) and with what the industry needs to do in order to meet the interim carbon-reduction targets that begin in 2022. Contrary to the statements of many State Declarants,[18] preparing the September 2016 submission will not cause irreparable harm to states. The actions required by September 2016 to secure the full three-year period to prepare a state plan are minimal and uncomplicated.

23. Furthermore, a state is free to decide to do nothing – not even to ask for a two-year extension – and to make no filing at all by September 2016. The State Declarants largely overlook this fact. Nor do they acknowledge that no state must

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[16] The declarations of Ms. Fox, Mr. Soward, and Ms. Roberts are attached to the filings of the environmental movant-intervenors; the declaration of Ms. Marks is attached to EPA's response in opposition to the motions to stay of the Final Rule. See also the declarations of Kathryn Watson and George Meyer, on behalf of the Sierra Club.

[17] Examples include: Hyde Declaration (Texas), pages 10-13; Easterly Declaration (Indiana), page 6; Gross Declaration (Kansas), page 5; Hays Declaration (Georgia), page 2; Martin Declaration (New Jersey), pages 5-11; Mroz Declaration (New Jersey), generally; Thomas Declaration (Arkansas), page 2; Wreath Declaration (Oklahoma), generally.

[18] See, for example, the following: Bracht Declaration (Nebraska); Durham Declaration (West Virginia); Easterly Declaration (Indiana); Goss Declaration (Kansas); Hodanbosi Declaration (Ohio); Hyde and Lloyd Declarations (Texas); Martin and Mroz Declarations (New Jersey); Nowak Declaration (Wisconsin); Spencer and Thomas Declarations (Arkansas); Wreath Declaration (Oklahoma).

make binding commitments or adopt regulations or legislation before its September 2016 initial submission, if the state chooses to submit one.

24. If a state chooses not to participate, the responsibility for limiting the carbon-dioxide emissions of power plants in that state will rest with the EPA under a federal plan, as I noted previously. The Clean Power Plan indicates that a federal plan will be issued within twelve months after a state fails to make a required submission. Once a federal plan is in place, the state itself need not do anything, and EPA's two proposed approaches to a federal plan would involve traditional limitations that apply exclusively to owners of electric generating units covered by the Clean Air Act. Any state that does not submit a plan or extension request may at any later point submit an approvable plan, which would supersede the federal plan once approved.

IV. CLEAN POWER PLAN IMPACTS ON STATES' ABILITY TO REGULATE THEIR ELECTRIC INDUSTRIES

25. The State Declarants also generally overstate the complexity entailed in developing final state plans by 2018 and they exaggerate the implications of the Clean Power Plan for each state's ability to shape policies affecting the electric industry within its borders. For context: the EPA has established two source-specific carbon-dioxide emission-performance rates, one for fossil steam power plants (coal-fired plants) and one for natural gas combined cycle power plants. Based on these two emission-performance rates, the EPA also set a specific emission-rate target for each state reflecting the mix of carbon-emitting (i.e., coal and natural-gas) plants located in the state in a baseline year. Further, EPA provided each state with the alternative of converting its rate-based target into an equivalent mass-based target (with the latter

designating emission limits for individual sources denominated in tons per year). There are source- or state-specific targets for the interim period (starting 2022) and for the final period (2030 and beyond), and a gradual phase-in of the standards between 2022 and 2029.

26. If a state elects to develop and submit a state plan, the state may choose to apply any of those targets to affected power plants in its state through an "emission standard plan," or it may choose to prepare a state measures plan with tailored policies and approaches which together would be designed to bring the collective emissions of plants in the state into compliance with the state-specific target.

27. The State Declarants appear to base their comments principally on EPA's June 2014 proposed rule, not on the final Clean Power Plan, and their comments presume the use of the least-flexible options that EPA offers them. The final Clean Power Plan clarifies and simplifies the options available to the states, and provides detailed guidance to assist them in crafting approvable and cost-efficient plans. Among other things, the analytic and regulatory steps associated with developing state plans are much more straightforward and less complex under the final Clean Power Plan than as portrayed by many of the State Declarants. For instance the final Clean Power Plan makes it much easier for states to adopt cost-reducing approaches, such as emissions-trading among power plants in different states with compatible plans, without the need for states to negotiate any interstate agreements. The choices EPA made in designing the final rule reflect the agency's understanding of the variations that exist among states' electricity systems, and the final Clean Power Plan offers the states (and power plant owners) significant latitude to determine the optimal timing,

manner, and distribution of emission-reduction requirements across power plants, and to adjust the path over time as circumstances warrant. Contrary to the statements of many State Declarants (e.g., Oklahoma Declarants; Texas Declarants), the final rule does not dictate a particular mix or portfolio of electricity resources in any state. The three building blocks EPA used to establish the Best System of Emission Reduction do not prescribe that those strategies be used to design compliance approaches. In addition, EPA has proposed detailed draft model state plans and guidance along with the Clean Power Plan, which – once finalized – will greatly assist the states in crafting approvable plans. Such clarifications are directly responsive to concerns similar to those in the State Declarations that were expressed by states and others during the comment period on EPA's proposed rule. Provisions in the final Clean Power Plan demonstrate EPA's deliberate choice to be responsive to states' comments and concerns.

28. Contrary to assertions by various State Declarants,[19] the final Clean Power Plan will not require them to restructure their electric industries or otherwise make fundamental changes to how their electric systems operate (or are economically regulated). Declarant Hyde (Texas) errs in asserting that "the only way to meet these emission levels will be to reorganize the state's electric grid by reducing generation from certain facilities, increasing generation at others, and investing in and

[19] See, for example, Bracht Declaration (Nebraska), generally; Hyde Declaration (Texas), pages 3, 5 and 8; Lloyd Declaration (Texas), pages 16, 41-42; Thomas Declaration (Arkansas), page 2.

constructing new generation facilities."[20] Similarly, Mr. Thomas (Arkansas) mistakenly believes that the rule could "dramatically transform the way electric power will be generated and transmitted to consumers in his state."[21] These declarants are fundamentally wrong in asserting that the Clean Power Plan will change practices related to dispatching power plants, and they are also wrong that the Clean Power Plan will require them to restructure their electric industries. In these and other states, the grid operator (e.g., the utility or the Regional Transmission Organization) dispatches power plants starting with those with the lowest operating costs and then bringing units with higher operating costs on line as demand changes. (This is typically called 'economic dispatch.') As fuel prices change and affect the operating costs of different power plants, a plant that formerly would have operated ahead of another might become less economic, with its output reduced relative to the prior situation. This happens routinely and typically over time, in response to fuel price changes, or to a changing portfolio as power plants are added or retired (as I describe further in Sections V and VII). This is the way the electric system has worked for the three decades I have been involved as a utility regulator and as an electric-industry expert. Contrary to the assertions of the various State Declarants, the Clean Power Plan will not introduce fundamental changes to the manner in which a set of generating resources is called upon (e.g., through economic dispatch) to meet changing conditions of electricity demand and the costs of power production.

[20] Hyde Declaration (Texas), page 8.
[21] Thomas Declaration (Arkansas), page 2.

29. For similar reasons, several State Declarants (e.g., from Texas, Oklahoma, Kansas, New Jersey, and Wisconsin) mischaracterize the implications of the Clean Power Plan when they say that it will deprive their state of sovereignty over its energy system.[22] Unless a state voluntarily chooses to change the structure of its electric industry in direct or indirect reaction to the EPA's regulation of carbon emissions from power plants, the electric system will continue to be regulated and to operate under the Clean Power Plan as it would in the absence of it. The costs of operating different power plants may change (due, for example, to compliance strategies in which the owner of one power plant needs to purchase emission-reduction credits to offset its high-carbon-emitting generation). Or the number of hours a plant might be available to operate might change due to new air permit restrictions. But the power-system fundamentals do not need to change – and the Clean Power Plan certainly would not "upend" competitive (or even traditionally regulated) electricity markets.[23] Nor would the structure of a state's electric industry need to change if a generating unit ended up with a new restriction in its air permit that limited the hours it may operate over the course of a year; it is not unusual today for power plants to have

[22] Hyde Declaration (Texas), pages 8-9, 14 ("forfeit sovereignty over its environmental and energy regulatory programs" and require the state "make policy choices about the manner in which electricity is generated, transmitted, and consumed."); Lloyd Declaration (Texas), page 4 ("experience a "seizure of control over planning, operations, resource decisions in electricity markets); McClanahan Declaration (Kansas), page 3 ("unprecedented infringement by the EPA on the traditional authority of Kansas to manage its energy resources") and generally. See also Mroz Declaration (New Jersey); Nowak Declaration (Wisconsin); and Spencer Declaration (Arkansas).

[23] Lloyd Declaration (Texas), page 15.

such operating restrictions that are taken into account by the grid operator in determining how frequently to call on a plant to generate electricity. And nor would the fundamental jobs of utility regulators or air regulators change in a state as a result of the Clean Power plan.

30. Numerous State Declarants allege that environmental agencies will need new legislative authority in order to force shifts in generation and directly regulate renewable energy and energy efficiency.[24] These declarants mischaracterize the Clean Power Plan, which directs states to set limits on emissions from power plants – an activity well within the purview of state environmental agencies. Though State Declarants claim to need legislation to expand their authority, most have existing statutory or regulatory authorization sufficient to impose emissions limits on power plants or otherwise implement the Clean Power Plan. For example, Declarant Hodanbosi suggests the Clean Power Plan "could require a sweeping change to the Ohio EPA's authority."[25] However, Ohio statutes give the Director of Environmental Protection the authority to "[a]dopt, modify, suspend, and rescind rules for the prevention, control, and abatement of air pollution, including rules prescribing for the state as a whole or for various areas of the state emission standards for air contaminants."[26] Similarly, Declarant Stevens (Wisconsin) claims the state

[24] See, e.g., Gore Declaration (Alabama), page 2 (legislation needed to allow the Alabama Department of Environmental Management to "regulate facilities and consumer behavior in new ways"); Hays Declaration (Georgia), page 2 (legislation needed to allow Georgia Environmental Protection Division to "require utilities...to use natural gas instead of coal").
[25] Hodanbosi Declaration (Ohio), page 5.
[26] Ohio Revised Code Sec. 3704.03(E).

legislature will need to "re-write [the] statute to fundamentally change the WDNR's authority."[27] However, Wisconsin law directs the Wisconsin Department of Natural Resources to "organize a comprehensive and integrated program to enhance the quality, management and protection of the state's air resources"[28] and empowers the agency to "promulgate rules implementing and consistent with" that directive.[29]

31. Further, in a state like Texas, which relies heavily on a competitive electricity market (rather than administrative actions of state agencies) to govern planning, cost-recovery, and operations of electric generating resources, no changes in the state's regulatory structure would be needed. Thus, the Lloyd Declaration's detailed discussion (on pages 8-15) of the structure of the Texas electric industry is a distraction and irrelevant to whether there will be harm during the period of the Court's review, or later implementation of the Clean Power Plan.[30] Indeed, if Texas

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[27] Stevens Declaration, page 3.
[28] Wisconsin Statutes 285.11(5).
[29] Wisconsin Statutes 285.11(1).
[30] For example, the Lloyd Declaration discusses various topics that have no bearing on the question of whether there will need to be changes in the retail or wholesale electricity markets in Texas in order for owners of electric generating units in Texas to comply with the Clean Power Plan. To illustrate the point (rather than address each point he makes in an exhaustive fashion), the following topics he addresses are irrelevant to the question of whether there will be irreparable harm from a stay during the Court's review of these petitions: (a) His discussion (on page 8) of the amount of wind available to meet peak demand for electric is irrelevant, given that compliance with the emission standards allows averaging across the 8,760 hours of one year and then across the 26,280 hours of the three-year averaging period. (b) His discussion (on pages 9-11) of the single-state nature of the electric grid in Texas ("ERCOT") is irrelevant in light of the ability of generators (e.g., under a Federal Plan) to purchase emission reduction credits created in other states as compliance mechanism in Texas (starting in 2022); (c) His mention of the state's adoption of a competitive market

elected not to submit a state plan, coal- and gas-fired generators in the state would become subject to a federal plan. Prices and dispatch of power plants in the competitive electricity market would then reflect changes in the costs of power produced at various generating units, and the grid operator's decisions to dispatch various generating units would take that cost into account. The state would not need to take any action under the federal plan, and carbon-pollution controls would meld seamlessly into the structure of the power system. Indeed, this kind of seamless integration of a carbon-control program into the operation of the electric industry has already occurred in other parts of the country, like the nine-state region in the MidAtlantic/Northeast area of the country which operates the Regional Greenhouse Gas Initiative.[31] (See the Declaration of Jeanne Fox.)

(page 12), of the structure of the Texas electric industry (page 13), and of the existence of retail competition in Texas (page 14) are all irrelevant.

[31] The implementation of the Regional Greenhouse Gas Initiative ("RGGI") – the nation's first carbon-control program affecting existing power plants – "over six years has not adversely affected power system reliability in New England, New York, or PJM. The pricing of carbon in Northeast and Mid-Atlantic electricity markets has been seamless from an operational point of view and successful from the perspective of efficient pricing of emission control in regional markets." Paul Hibbard, Andrea Okie, Susan Tierney, and Pavel Darling, "The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States: Review of RGGI's Second Three-Year Compliance Period (2012-2014)," July 2015, page 13. New Jersey (one of the petitioning states) was a member of RGGI for the first three years of the program, and did not experience any problems in the operations of power plants as part of the interstate system in which New Jersey is part (i.e., the so-called PJM region). Paul Hibbard, Susan Tierney, Andrea M. Okie, Pavel G. Darling, "The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States: Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period," November 15, 2011.

32. Also, electric generating units in Texas are already subject to a federal plan establishing an emissions-trading program for nitrogen oxides and sulfur dioxides under the EPA's Cross-State Air Pollution Rule. This fact counters the claims of Texas Declarants that such a market-based air-pollution control program (as would arise in Texas if it elected not to submit a plan and EPA imposed a federal plan – which as proposed would be a market-based plan – in the state) would cause the state to change the fundamental structure of its electric industry. (More generally, more than three quarters (i.e., 22 out of 27) of the movant states have adopted market-based programs for non-greenhouse gas pollutants from the power sector.[32] These states' electric systems did not need to be restructured, for example, when the market-based Acid Rain sulfur-dioxide emission-trading program started up in 1990.)

33. In a state like Oklahoma, whose power sector is more traditionally structured and regulated, there is also no reason why the Clean Power Plan would usurp sovereignty over how the state regulates its electric sector. Again, assuming that such a state did not want to submit a plan, the electric generating units in the state (many but not all of which are owned by regulated electric utilities) would become subject to carbon emissions limits under a federal plan. After that plan's starting date, the owner of an electric generating unit subject to the Clean Power Plan would have choices

[32] By my count, the following movant states are either part of the Cross State Air Pollution Rule, the NOx Budget Trading Program, an emission trading program under the Regional Haze Program, or the sulfur-dioxide trading program under Title IV of the Clean Air Act: Alabama, Arkansas, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Carolina, Nebraska, New Jersey, Ohio, Oklahoma, South Carolina, Texas, Utah, Wisconsin, West Virginia, and Wyoming.

about what steps to take to control its emissions (e.g., tightening up the efficiency of its operations through equipment or process changes, or switching to a lower-carbon fuel, or buying credits from lower-carbon sources of power to offset the plant's output). If that power plant owner were an electric utility subject to traditional cost-of-service regulation by the state utility commission, the utility could seek to recover its costs through general rate cases, fuel-adjustment proceedings, or other proceedings through which the state utility commission establishes the rates a company may charge its customers for electricity service. If an Oklahoma power plant is owned by a non-utility generating company, it would typically not go to the state for recovery of changes in its cost of operation at all (unless its power sales contract with the utility allowed such, in which case this again could take place through 'business as usual' procedural mechanisms which would not undermine the sovereignty of the state government). Either way, there would not need to be a fundamental change in the regulatory processes of the state utility commission.

34. In his declaration, Mr. Lloyd (Texas) asserts that in the absence of a stay of the Clean Power Plan, coal-fired power plant owners will have to make irreversible decisions to retire their plants. In his view, in the absence of a stay, some power plant owners would have to retire plants in the near term if they faced going-forward investments to keep the plant operating during the period of the Court's review. But this perspective fails to take into account at least three important factors which undermine his conclusions. First, he fails to note that the study he relies upon to reach conclusions about potential retirements – an October 15, 2015 study prepared by the Texas grid operators (known as ERCOT) of the impacts of the final Clean

Power Plan on the region's power system – concludes that the estimated retirements attributable to the Clean Power Plan occur by 2025, 10 years from now.[33] Second, he fails to distinguish between retirements driven by the Clean Power Plan versus other external factors (e.g., other environmental regulations). (See my further discussion of this second issue in Section V, below.) And third, he fails to recognize that a stay would not remove the risk that near-term investment to keep a plant available to operate might end up being an uneconomical decision if the Clean Power Plan is upheld at the end of the Court's review. With or without a stay, decisions during the litigation period must take into account a host of market risks – such as changing fuel prices, the entry of renewable resources to meet state policy requirements, or the risk that there will be carbon regulation at the end of the litigation period and starting in 2022.

35. Several State Declarants make assertions about various harms to their state's power system or energy mix that they believe will result from the Clean Power Plan in

[33] "ERCOT's modeling of the CPP final rule suggests a different magnitude of impacts compared to the proposed rule. While these modeling results continue to indicate the potential for shifts in the generation mix away from coal and towards natural gas and renewables, the timing and magnitude of these trends differ. The modeling results indicate the potential retirement of at least 4,000 MW of coal-fired capacity due specifically to compliance with the CPP, occurring starting in 2025.…As with the proposed rule, the modeling predicts a sizeable amount of renewable capacity additions, due both to the improving economics of these technologies as well as impacts of regulating CO2 emissions. Whereas the previous study saw customer costs increase as early as 2020, due to the stringency of the proposed interim compliance requirements, this analysis sees negligible increases in customer costs by 2022, but sizeable increases in 2030." ERCOT, "Analysis of the Impacts of the Clean Power Plan *Final Rule Update,"* October 16, 2015, page 6.

the period well beyond 2022. These claims are irrelevant to whether irreparable harm will occur during this Court's review of the merits. Further, they are not grounded in facts. For example, the Kansas Declaration claims there are a "limited number of viable sites for wind energy development in Kansas."[34] This assertion is inconsistent with the wind resource data from the U.S. Department of Energy's National Renewable Energy Laboratory ("NREL"), which indicates that substantial wind resources exist across nearly the entire state of Kansas, even taking many land use restrictions into account.[35] The Wisconsin Declaration asserts that the Clean Power Plan will introduce electric-system reliability challenges associated with integrating renewable energy facilities.[36] This statement is inconsistent with the empirical experience of the many states and regional grid operators (including in the mid-continent portion of the U.S.) that have already introduced significant wind generating capacity with no adverse reliability consequences.[37] The Indiana Declaration states that the timeline for bringing renewable resources on line is too long to meet the Clean Power Plan requirements.[38] This assertion is inconsistent with actual project

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[34] Gross Declaration (Kansas), pages 3-4.
[35] U.S. Department of Energy, WINDExchange: Kansas Wind Resources Map and Potential Wind Capacity, http://apps2.eere.energy.gov/wind/windexchange/wind_resource_maps.asp?stateab=ks; U.S. Department of Energy, National Renewable Energy Laboratory, Estimates of Land Area and Wind Energy Potential, by State (Feb. 2015), http://apps2.eere.energy.gov/wind/windexchange/docs/wind_potential_80m_110m_140m_35percent.xlsx.
[36] Nowak Declaration (Wisconsin), page 9.
[37] Nivad Navid, Midwest ISO, Multi-faceted Solution for Managing Flexibility with High Penetration of Renewable Resources, available at http://www.ferc.gov/CalendarFiles/20140411130433-T1-A%20-%20Navid.pdf.
[38] Easterly Declaration (Indiana), pages 6-7.

experience around the country in which wind and solar projects have come on line in time periods as short as two to three years – periods well shorter than required for many large-scale fossil energy projects.[39] (I discuss these issues further in Section V.)

36. Contrary to assertions by the State Declarants, the use of emissions-trading mechanisms to enable power plants to meet their emission limits is hardly unorthodox or unfamiliar to state officials. Since 1990, Title IV of the Clean Air Act has required power plants that emit sulfur dioxide (e.g., coal-fired power plants) to comply with a national emissions-trading programs to control this pollutant in a cost-efficient, market-based manner that allows some power plants to emit above their nominal emission limits by buying credits from companies that emit below those limits. Under EPA's Cross-State Air Pollution Rule, 27 states in the eastern United States (including many of the movant states) are using similar emissions-trading programs to limit sulfur-dioxide and nitrogen-oxide emissions from fossil fuel-fired power plants. Existing emissions-trading programs include mechanisms to credit a variety of activities that reduce emissions from fossil fuel-fired power plants, such as end-use energy efficiency measures. Such approaches operate seamlessly in the daily operations of power plants and power markets and do not raise operational or reliability issues. All states have the capability to adopt state plans that allow power plants to engage in carbon-dioxide emissions trading with power plants in other states.

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[39] See, e.g., Iowa Energy Center, MidAmerican Energy announces 5 new Iowa wind farms, August 13, 2013, http://www.iowaenergycenter.org/2013/08/midamerican-energy-announces-5-new-iowa-wind-farms/; U.S. Energy Information Administration, "Renewable Electricity Production Grows in Texas," *Today in Energy,* December 2, 2013, http://www.eia.gov/todayinenergy/detail.cfm?id=13991.

37. Thus, movants err in contending that the flexible, system-based architecture of the Clean Power Plan is unprecedented. A recent analysis of prior Clean Air Act programs – covering the power sector and other sectors – indicates the many prior programs that have also employed flexible market-based architectures.[40]

38. The State Declarants acknowledge, indirectly, that states are not starting state plan development from scratch. States have been engaged in considering and developing their state plan options since the EPA's original June 2014 proposal. The states provided extensive comments on the proposal with insights that the EPA took into consideration as the agency revised the proposed rule and issued the final one. I have personally participated in and am aware of substantial conversations, convenings, analyses, studies, and stakeholder meetings in various parts of the country and in national conferences and industry forums about the Clean Power Plan during the past year and a half. Many states with power plants that participate in regional, multi-state markets (e.g., Indiana, West Virginia, Wisconsin, Ohio, Kentucky) have existing organizations (e.g., the Organization of PJM States; the Organization of MISO States) which facilitate interstate collaboration, discussions, education, advocacy, and so forth. Other states (e.g., Western states; the Midwest States Energy and Environmental Regulators group) have begun to confer in ad-hoc meeting groups to understand the options available to them. Every state is well positioned to file a

[40] Richard L. Revesz, Denise A. Grab, and Jack Lienke, "Familiar Territory: A Survey of Legal Precedents for the Clean Power Plan," Institute for Policy Integrity Working Paper, December 4, 2015, available at http://policyintegrity.org/files/publications/FamiliarTerritory.pdf.

simple extension request, if needed, by September 2016 and to develop a final plan by 2018.

V. IMPACTS OF THE CLEAN POWER PLAN ON THE ELECTRIC INDUSTRY

39. In this section, I respond to claims made by industry declarants. Overall, many of their conclusions lack foundation in rigorous and/or transparent analyses. An example is in the Heidell/Repsher Declaration and their PA Consulting Group report, both of which are attached to the filings of the Utility and Allied Group. Their conclusions that there will be 50 gigawatts of incremental power plant retirements by 2020 and that there will be immediate damages to coal plant owners and their supply chains are not based on modeling or other verifiable quantitative support.[41]

40. The Schwartz Declaration on behalf of the National Mining Association similarly asserts that the Clean Power Plan will cause specific power plants to retire during the period of the Court's review, that irreparable harm will result, and that a stay would avoid those retirements.[42] Mr. Schwartz claims that EPA's own modeling (the so-called "IPM modeling runs") reveals the identity of the plants that he says the Clean Power Plan will force to retire in 2016 and 2017.[43] Mr. Schwartz's reliance on the EPA modeling runs as the basis for claiming that the Clean Power Plan will cause particular power plants to retire in the near term is flawed. The Clean Power Plan

[41] Heidell/Repsher Declaration, paragraph 10, based on PA Consulting Report, generally.
[42] Schwartz Declaration, page 11.
[43] Schwartz Declaration, pages 2-4 and 19-22.

imposes no emission limits before 2022. EPA has stated that its IPM modeling runs are merely illustrative scenarios of compliance pathways that plant owners might choose, based on specific agency assumptions regarding fuel prices, state plan design, and many other factors. Prepared in advance of knowing what choices each state that elects to submit a state plan will make in the design of that plan, EPA necessarily conducted its modeling on the basis of a set of specified assumptions, and as such this modeling can only be illustrative rather than dispositive or determinative.[44] The Burtraw/Linn Declaration filed on behalf of environmental movant-intervenors further explains the reasons why IPM model runs do not (indeed, cannot) require the early plant retirements Mr. Schwartz claims.

41. Mr. Schwartz erroneously states that the coal plants he identifies as retiring in the IPM policy case are "necessary for states to comply with the CPP."[45] EPA's modeling of potential pathways for compliance does constitute a mandate relative to actions at individual plants; power plant owners will not be required to retire specific plants in accordance with modeling output. There is no requirement that any plant retire even in 2022, much less in 2016. In the real world, power plant retirements will occur when and if owners decide that the plants are no longer competitive or economically viable. This is how the power sector works. Although plant owners

[44] EPA states clearly and throughout its Regulatory Impact Analysis for the Clean Power Plan Final Rule ("RIA") that its results are illustrative. For example: "Given the flexibilities afforded states in complying with the emission guidelines, the benefits, cost and economic impacts reported in this RIA are not definitive estimates. Rather, the impact estimates are instead illustrative of approaches that states may take." Executive Summary of the EPA's RIA, page 3.

[45] Schwartz Declaration, paragraph 35.

face uncertainty about state plan designs and other factors, these uncertainties do not compel the owners to retire those plants. Rather, as the Burtraw/Linn Declaration explains, when making decisions far in advance of the regulatory requirements that take effect only in 2022, a plant owner that faces uncertainties is far more apt to delay investment or retirement decisions to wait for more information and to defer plant retrofit or closure decisions to a point considerably closer to the compliance date. Power plant owners routinely keep plants operating through tough periods (due, for example, to temporary fuel price fluctuations or economic conditions). Short of fully retiring plants, owners can mothball them in order to maintain the possibility of reopening them at a later date (which I describe further below). In short, there are multiple strategies that owners can – and do – use to keep their options open as more information is learned about real-world conditions, and an owner will not close a plant that is currently profitable before it had to.

42. As discussed in detail in the Burtraw/Linn Declaration and based on my own decades of experience in modeling and understanding models used in the electric industry, the IPM model is a well-vetted, credible, and reliable tool for analyzing how the power sector will respond to new emission standards over the long-term and in the aggregate. The model can be used most effectively to analyze near-term responses only when compliance deadlines occur in the near term. The longer the lead time, and the greater the uncertainties within that lead-time, the less compelling IPM's near-term projections will be. In this instance, because the Clean Power Plan's compliance deadlines fall 7-15 years in advance, IPM runs must be based on idealized modeling assumptions, including the assumption that power plant owners and operators can act

with "perfect foresight," i.e., with perfect advance information regarding relevant variables such as future fuel prices, economic conditions, and choices states have yet to make regarding the design of state plans. Those state-plan design choices include whether to adopt a rate-based or mass-based plan, how to assign responsibilities among emitters (through emission rates or allowance allocations), and what forms of flexibility to adopt (including intra-state or inter-state emissions trading). In the real world, of course, power plant owners face considerable sources and types of uncertainty (e.g., future energy prices, demand for electricity, additions of new plants, retirements of existing plants) and they have to make judgments about plant operations and investments that take such uncertainties into account.

43. Given the long lead-time before compliance deadlines, and because of these many sources of uncertainty, including regarding the design of state plans, prudent plant owners will tend to keep their options open as long as possible. This means that they will tend to defer retirements rather than rush into them (and may even decide to mothball them temporarily). A plant owner is unlikely to shut a profitable plant now because it might not be profitable in the future under a regulation taking effect in seven years. On the other hand, a plant owner might choose to shut a marginally profitable plant now rather than make retrofit investments necessary to comply with *other*, nearer-term standards, if the plant has poor prospects for profitable operation once the Clean Power Plan takes effect in 2022. Thus, retirements that may occur in the near-term would be the result of plant owners' voluntary business decisions in response to market factors and other regulations, but they are not mandated by Clean Power Plan limits that will go into effect nearly seven years from now.

44. Notably, a careful reading of the declarations submitted by Luminant, AEP Corporation, and Southern Company (and their affiliates) confirms that the IPM model is over-predicting near-term retirements.[46] Each of these declarations, filed on behalf of companies that own coal plants subject to the Clean Power Plan, points to EPA's IPM results in discussing retirements of their plants and entirely avoids stating whether the company actually intends to retire the plants identified by Schwartz as supposedly compelled to close. This fact supports my prior observation that prudent power plant owners typically delay decisions about plant retirements for as long as possible in order to keep their options open in the face of uncertainty. And in the case of the Clean Power Plan, whose initial compliance period begins many years in the future, the fact that these declarants do not affirm that specific near-term retirements will occur is significant, and contradicts the assertions by Mr. Schwartz that there will be irreparable harm in the absence of a stay.

45. Mr. Schwartz' study (attached to his declaration) focuses only on potential costs of the proposed rule over its life, and does not address any of the benefits of implementing the Clean Power Plan. Over the life of the Clean Power Plan, such beneficial impacts include: (1) avoidance of dangerous climate impacts and costs that

[46] See, for example, the following declarations attached to the filings of the Utility and Allied Group: the Frenzel Declaration (on behalf of Luminant); the Patton Declaration (from Appalachian Power and Wheeling Power Company, subsidiaries of AEP); the Green Declaration, the Heilbron Declaration, the Burroughs Declaration, the Reaves Declaration, and the Pemberton Declaration (all from Southern Company or its affiliated companies).

such will impose on local and national economies;[47] (2) public health benefits from reducing other power plant emissions that cause dangerous fine particle and ozone pollution; (3) consumer electric bill savings (driven mainly by energy efficiency investments); and (4) positive job impacts resulting from employment gains in renewable energy, energy efficiency, and other parts of the electric industry that offset, if not exceed, job losses that may occur in the coal industry as a specific result of the Clean Power Plan once its emission limits actually begin to phase in.[48] EPA's economic analysis of the final rule concluded that as the Clean Power Plan goes into effect, it will have net positive benefits amounting to billions of dollars per year, taking the quantifiable public health and climate protection benefits into account.[49] Illustrating this point is a recent study prepared on behalf of the Oklahoma State

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[47] See, for example, Trevor Houser, et al., Economic Risks of Climate Change: An American Prospectus, Columbia University Press, August 2015; "Risky Business – The Economics of Climate Change in the United States: A Climate Risk Assessment for the United States," June 2014, available at http://riskybusiness.org/site/assets/uploads/2015/09/RiskyBusiness_Report_WEB_09_08_14.pdf; National Climate Assessment, 2014 (for which I was co-lead convening author of the chapter on Energy Supply and Use). Available at http://nca2014.globalchange.gov/downloads.

[48] See, for example, New Climate Economy, "Better Growth, Better Climate, 2014, available at http://2014.newclimateeconomy.report/wp-content/uploads/2014/08/BetterGrowth-BetterClimate_NCE_Synthesis-Report_web.pdf. For a recent analysis of the comprehensive job impacts of the proposed Clean Power Plan (taking into account both impacts on job-losing and job-gaining industries), see Josh Blevins, "A Comprehensive Analysis of the Employment Impacts of the EPA's Proposed Clean Power Plan," Economic Policy Institute, June 9, 2015, available at http://www.epi.org/publication/employment-analysis-epa-clean-power-plan//

[49] EPA, Clean Power Plan, pages 92-99; EPA RIA, generally and specifically in Chapters 3-6 and related appendices.

Chamber Foundation,[50] which identified the substantial benefits that have flowed to the state's economy as a result of development of its abundant wind resources. In reporting on this study, an energy reporter described it in this way: "A decade of unprecedented wind power growth in the Southern Plains has transformed Oklahoma from an oil-patch state into one of the nation's centers of clean energy production, and the state is richer for it, according to new research released this week. In the past 12 years, Oklahoma has grown from having no utility-scale wind energy capacity to now having nearly 4,000 megawatts of capacity, making it the fourth-largest wind energy state in the United States. With projects currently under construction, Oklahoma is projected to have more than 5,000 megawatts of capacity by the end of 2015… A separate study estimates the wind industry has created more than 1,600 direct, full-time jobs in Oklahoma. Over the span of the entire model, which includes both Oklahoma's first wind energy projects (installed in 2003) and the forecast projects (whose last year of projected life is 2043), owners of wind energy projects will pay approximately $1 billion dollars in ad valorem taxes."[51]

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[50] Dr. Shannon L. Ferrell and Joshua Conaway, Oklahoma State University, Department of Agricultural Economics, "Wind Energy Industry Impacts in Oklahoma," Oklahoma State Chamber Foundation, November 2015, available at http://www.okstatechamber.com/sites/www.okstatechamber.com/files/RevisedReport_WindStudy9_3_15.pdf.

[51] Daniel Cusick, E&E Report, "Okla's economy grows with new wind power," *ClimateWire*, November 6, 2015: "Every dollar paid in Reimbursement Fund distributions yields $1.69 in owner-paid tax revenues to local governments and schools. A separate study estimates royalty payments to Oklahoma landowners where wind farms are located total more than $22 million annually. In addition, the ability to conduct livestock and crop operations coextensively with wind energy projects provides significant additional returns to landowners. Oklahoma's two investor-

46. Mr. Schwartz errs in relying upon the results from the Energy Information Administration's analysis of the Clean Power Plan. Most importantly, that agency's study (dated May 2015) reflects EPA's *proposed* Clean Power Plan rule (issued in June 2014), rather than the final rule (issued in August 2015), which allow more flexibility and changed the emission-reduction targets of states. The Burtraw/Linn Declaration provides a detailed assessment of the Energy Information Administration's modeling methodology, which has several features that inherently limit its ability to forecast specific power plant retirements.

47. Mr. Schwartz takes issue with specific assumptions EPA made in its IPM modeling runs to support the final rule, for example, regarding the expected cost of renewable power.[52] EPA documented its conclusions, on this point and many others, in a voluminous rulemaking record after thorough technical analysis, and after considering and responding to millions of comments on its proposed rule. Regarding renewable power cost assumptions, the record demonstrates that both private-sector and governmental analysts updated their assessments of the cost renewable electricity projects, with the result that EPA's (and others') cost estimates for future projects significantly declined between the proposal and promulgation of the Clean Power Plan. EPA took the latest cost studies into account (along with information contained in many comments filed during the rulemaking process) in the modeling assumptions used to analyze its final regulation. Forward prices for fossil fuels (natural gas and

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owned utilities have estimated their use of power from wind energy projects will save ratepayers nearly $2 billion."

[52] Schwartz Declaration, pages 11-13, and 21-30, and Schwartz Report, Section II.

coal) also changed and were incorporated into the analyses. For the purpose of conducting the best possible modeling of future scenarios, it was appropriate for EPA to update its assumptions in its modeling of the final rule.

48. The Schwartz and Heidell/Respher Declarations' discussions of the lead times for planning replacement capacity are also flawed. They begin with several false premises,[53] the most prominent of which is that nothing is already in the development queue. In effect, these declarants treat the present day (i.e., Fall 2015) as if it is time zero and all projects that will contribute to Clean Power Plan compliance need to be begin from scratch starting now. They also represent that all of capacity they assert will retire in the near-term will need to be replaced with new generating resources requiring long lead-times.[54] Both of these premises are wrong.

49. First, there is already a considerable amount of new generating capacity in one or another stage of the development, permitting, and construction process (the elements that affect the lead time for bringing new capacity into commercial operation). Many projects have already been in development for several years, in response to market and policy signals encouraging cleaner sources of electricity (i.e., competitive conditions such as low natural gas prices and declining costs for wind and solar generation; state and federal policies, such as renewable energy incentives; pre-existing Clean Air Act standards). Utility companies and non-utility project

[53] See, for example: Schwartz Declaration, pages 3, 9-11 (and on pages 30-47 of his accompanying report); Heidell/Repsher Declaration and their PA Consulting Report, pages 9-11.
[54] Schwartz Report (pages 41-45); PA Consulting Report (pages 9-11).

developers are actively developing a large supply chain of new generation, as shown in the charts below (which display the substantial new capacity that is actively under development or construction in various regions of the United States). Figure 1 shows the natural-gas-fired generating capacity planned to enter in upcoming years, and Figure 2 displays the cumulative amounts of gas-fired capacity additions. Figure 3 provides the amounts of renewable generating capacity planned to enter in upcoming years, and Figure 4 shows the cumulative amounts for renewable capacity additions. Note that the power plant capacity shown in these figures includes projects that are planned (i.e., early development and advanced development) or under construction, but does not include plants that have only reached the "announced" stage.[55] Experience with power-plant siting suggests that some of the projects in the early phases development cycle have a lower probability of eventually entering service, and that the likelihood of planned capacity entering service increases in combination with

[55] The source of data, SNL Energy, tracks power plant developments around the U.S. SNL's subscription-service data are relied upon by industry analysts, and SNL provides the following description of how it categorizes power plants in different phases of the development cycle: "A project is placed in the announced status when a project is first reported publicly, a listing in an interconnect queue must be accompanied by some other public announcement or permitting action to qualify as a project. A project is updated to early development when the permitting process begins. A project is updated to advanced development when two of five criteria have been achieved: financing in place, power purchase agreement signed, turbines secured, required permits approved, or contractor signed on to the project. A project is updated to under construction when the construction of the actual facility has begun, site preparations do not qualify. A project is updated to complete when the development reports commercial operations have commenced." In its regional summaries of "future capacity" by region, SNL reports plants in the planned and under-construction phases. This is the source of the region-specific data reported in my figures.

need for capacity additions for reliability and economical-supply purposes. Therefore, one would not expect that each specific plant represented in the SNL dataset will actually enter service, but one would expect to see further capacity additions as conditions in the market send signals that further new supply is needed.

50. In light of the lead times for adding new gas-fired capacity and new renewable capacity, these are projects anticipated to come into service before 2020. Contrary to contentions of Schwartz, Heidell/Respher, and other declarants that new generation requires extraordinarily long lead-times, one would not expect to see new projects in active development at present for in-service dates beyond 2020. Thus the fact that limited capacity additions are already underway for 2020 and beyond does not mean that such projects will not be proposed and developed as that period gets closer.

Figure 1

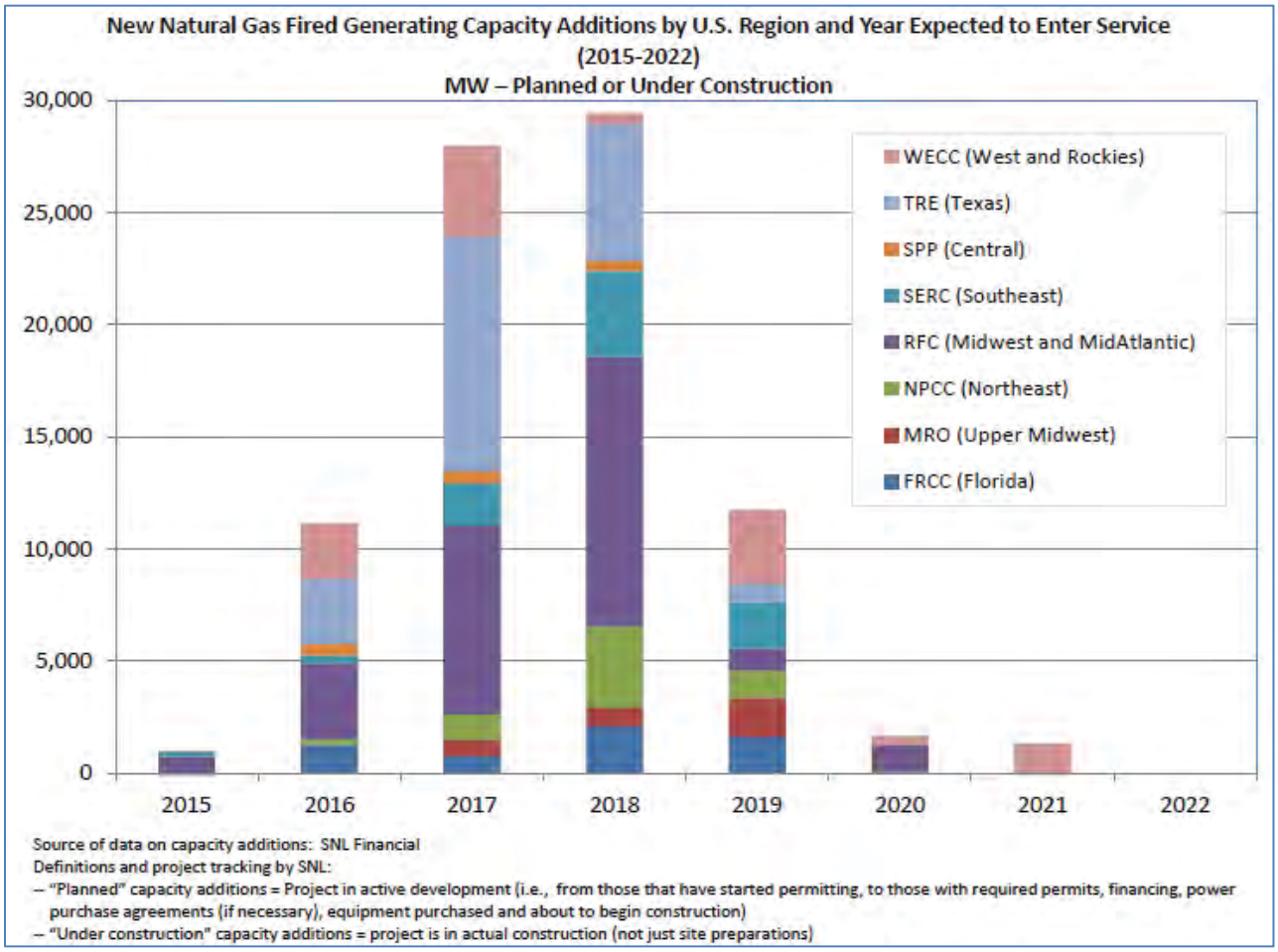

New Natural Gas Fired Generating Capacity Additions by U.S. Region and Year Expected to Enter Service
(2015-2022)
MW – Planned or Under Construction
30,000
25,000
20,000
15,000
10,000
5,000
0
2015
2016
2017
2018
2019
2020
2021
2022
WECC (West and Rockies)
TRE (Texas)
SPP (Central)
SERC (Southeast)
RFC (Midwest and MidAtlantic)
NPCC (Northeast)
MRO (Upper Midwest)
FRCC (Florida)
Source of data on capacity additions: SNL Financial
Definitions and project tracking by SNL:
– "Planned" capacity additions = Project in active development (i.e., from those that have started permitting, to those with required permits, financing, power purchase agreements (if necessary), equipment purchased and about to begin construction)
– "Under construction" capacity additions = project is in actual construction (not just site preparations)

Figure 2

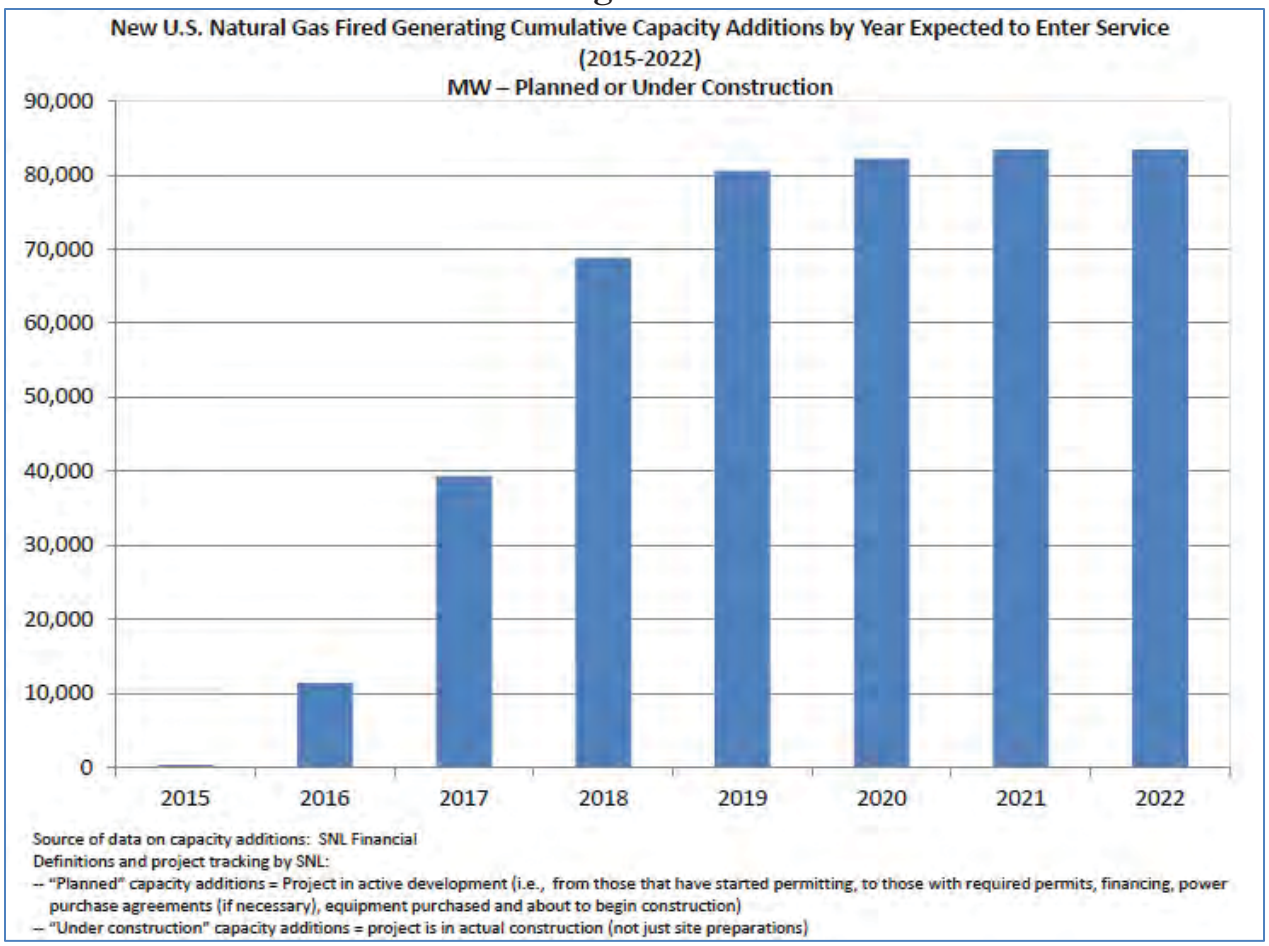

New U.S. Natural Gas Fired Generating Cumulative Capacity Additions by Year Expected to Enter Service
(2015-2022)
MW – Planned or Under Construction
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2015
2016
2017
2018
2019
2020
2021
2022
Source of data on capacity additions: SNL Financial
Definitions and project tracking by SNL:
-- "Planned" capacity additions = Project in active development (i.e., from those that have started permitting, to those with required permits, financing, power purchase agreements (if necessary), equipment purchased and about to begin construction)
-- "Under construction" capacity additions = project is in actual construction (not just site preparations)

Figure 3

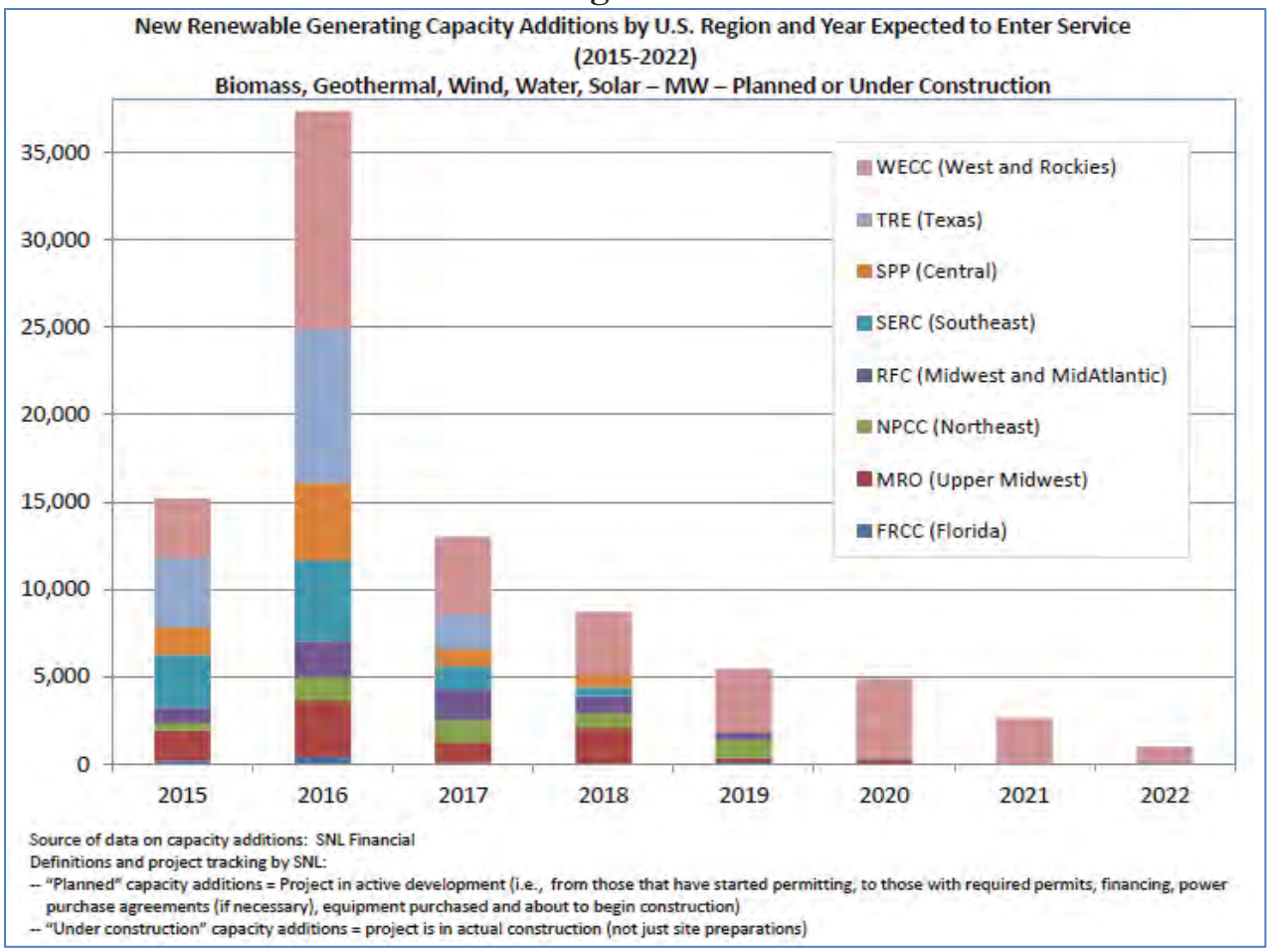
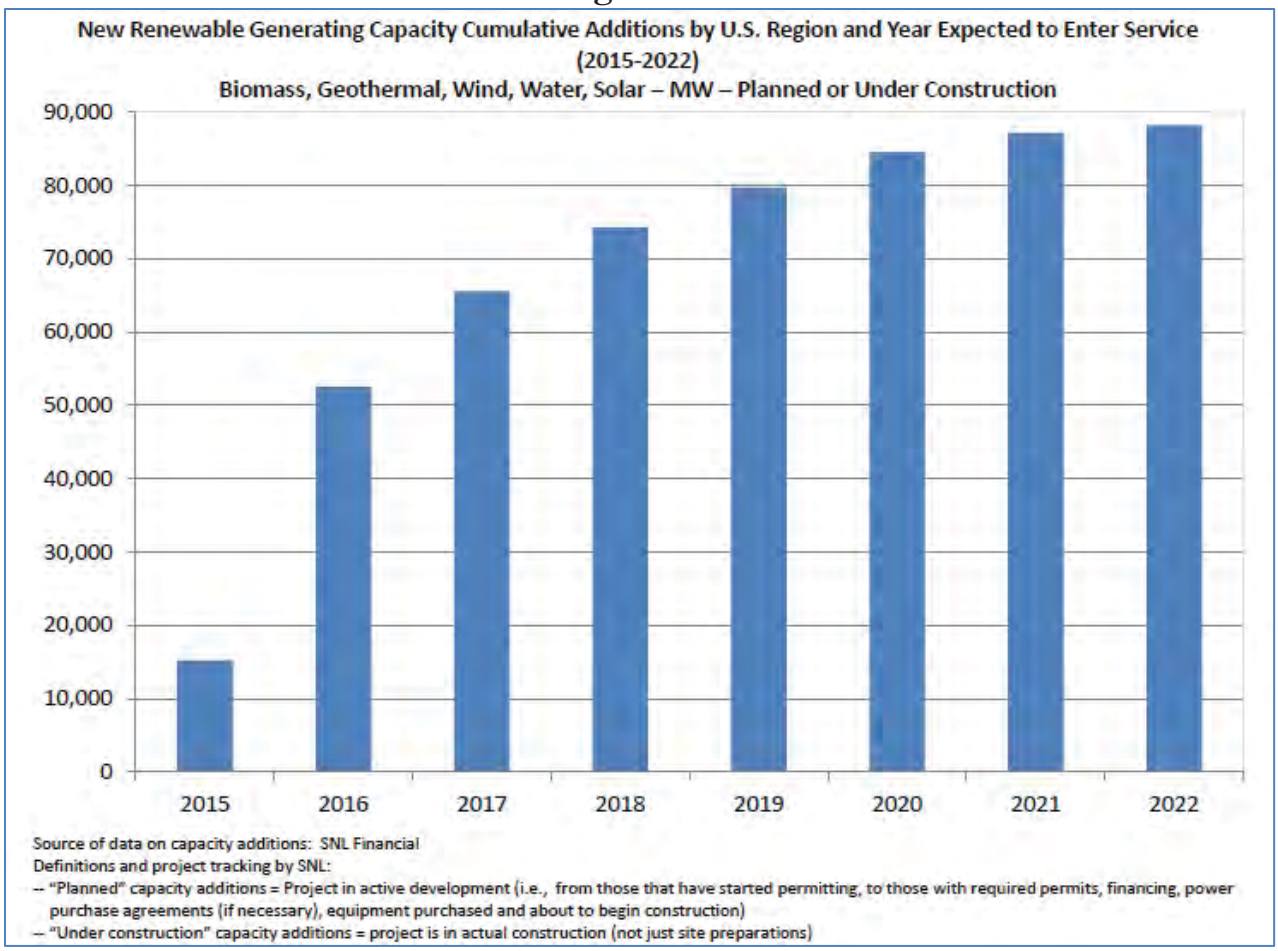

New Renewable Generating Capacity Additions by U.S. Region and Year Expected to Enter Service
(2015-2022)
Biomass, Geothermal, Wind, Water, Solar – MW – Planned or Under Construction
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2015
2016
2017
2018
2019
2020
2021
2022
WECC (West and Rockies)
TRE (Texas)
SPP (Central)
SERC (Southeast)
RFC (Midwest and MidAtlantic)
NPCC (Northeast)
MRO (Upper Midwest)
FRCC (Florida)
Source of data on capacity additions: SNL Financial
Definitions and project tracking by SNL:
-- "Planned" capacity additions = Project in active development (i.e., from those that have started permitting, to those with required permits, financing, power purchase agreements (if necessary), equipment purchased and about to begin construction)
-- "Under construction" capacity additions = project is in actual construction (not just site preparations)

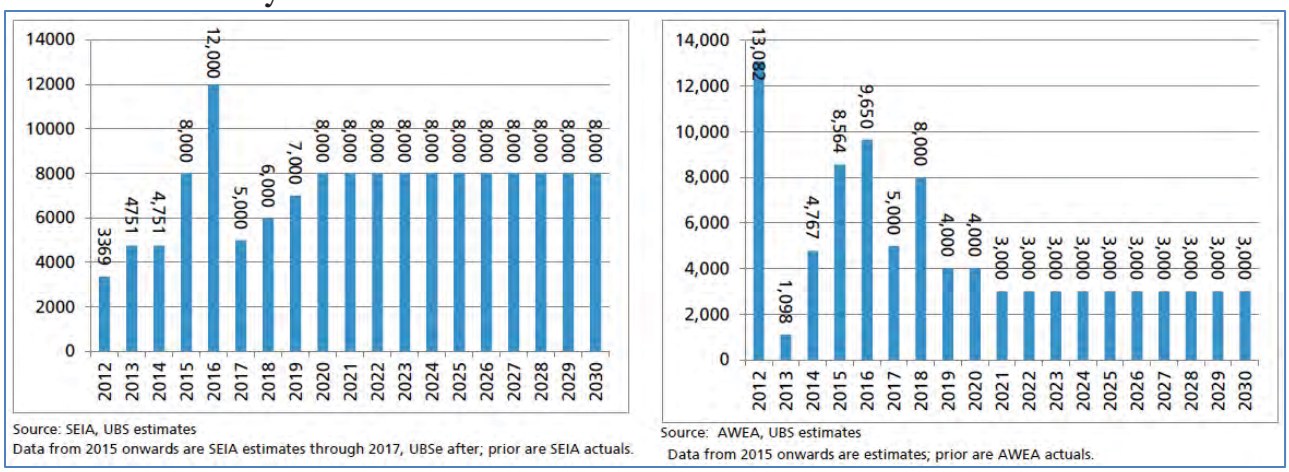
Figure 4



51. Looking beyond 2022, industry analysts anticipate an increasing supply of renewable generating resources, in response to declining costs, a continued policy push from state Renewable Portfolio Standards (in 29 states) and other policy incentives, and the preferences of many large[56] and small electricity customers for relying upon renewable electricity supply. (See Figure 5.)

[56] As of December 7, 2015, for example, 49 major U.S. companies have signed on to the "Corporate Renewable Energy Buyers Principles," with these companies' voluntary commitments to contract for and purchase amounting to 42 million MWh of renewables a year by 2020. The companies include GM, Amazon, Cisco, Kellogg, McDonalds, Kaiser Permanente, Unilever, Ikea, P&G, Yahoo, Target, DuPont, 3M,

Figure 5
Annual Incremental Solar and Wind Capacity Additions (MW)
(2012-2014 Actual; 2015-2030 Estimates)



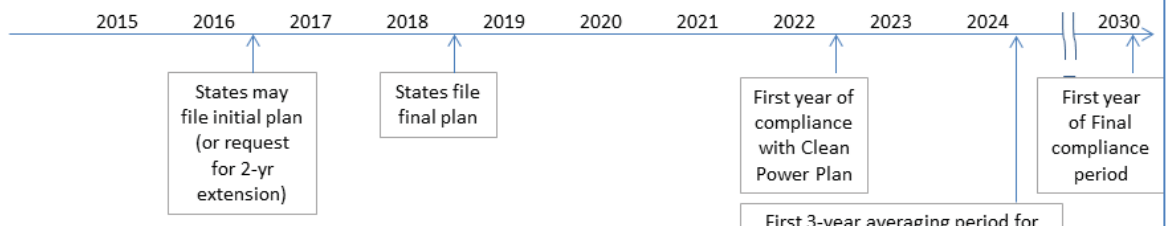
Source: UBS Global Research, "*3Q Preview: Preparing for a Low-Carbon Diet*," October 2015, page 16.

52. Taking into account these planned and under-construction power projects, and superimposing them on the timeline for the Clean Power Plan (in Figure 6, below), it can be seen that changes underway already in the electric generating system will support smooth implementation. Further, in the early years of new power plant development projects, the developer's expenditures are relatively low; it is only when a project moves to financing and paying for large and relatively expensive pieces of equipment (e.g., the turbine itself) that large out-of-pocket expenditures are made, and this would occur toward the eve of construction, not in the initial years.

Walmart, Staples, Adobe, Nestlé, Hilton, eBay, Intel, Google, Johnson & Johnson, EMC^2, Hewlett Packard, and Facebook. See: http://buyersprinciples.org/2015/12/07/release-google-mcdonalds-adidas-group-nestle-kellogg-and-avery-dennison-sign-on-to-renewable-energy-buyers-principles/.

Figure 6

Time Line for the Clean Power Plan,
With U.S. New Gas-Fired and Renewable Generating Capacity (Planned & Under Construction)



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2030
New **gas-fired** capacity (planned; under construction) (thousands of MW)											
Added in year:	0.5	11.2	28.0	29.4	11.8	1.7	1.2	n/a	n/a	n/a	n/a
Cumulative: (2015 on)	0.5	11.7	39.7	59.1	70.9	72.6	73.8	73.8	73.8	73.8	73.8
New **renewables** (planned; under construction) (thousands of MW)											
Added in year:	15.2	37.4	13.0	8.7	5.5	4.9	2.6	1.0	1.2	n/a	n/a
Cumulative: (2015 on)	15.2	52.6	65.6	74.3	79.8	84.7	87.3	88.3	89.5	89.5	89.5

Source of data on capacity additions: SNL Financial
Definitions and project tracking by SNL:
-- "Planned" capacity additions = Project in active development (i.e., from those that have started permitting, to those with required permits, financing, power purchase agreements (if necessary), equipment purchased and about to begin construction)
-- "Under construction" capacity additions = project is in actual construction (not just site preparations)

53. The second reason the Schwartz and Heidell/Repsher Declarations are in error is that the actual lead times for the types of power projects, energy efficiency measures, and other infrastructure on developers' drawing boards are substantially shorter than those claimed by Messrs. Schwartz, Heidell and Respher. Mr. Schwartz's references to how long it takes to build new nuclear power plants are irrelevant, because the economics of such plants do not support their development/construction any time soon. Natural gas peaking units can be added in three years, and have been built in less time in historical situations where an impending supply shortage

necessitated the addition of new capacity for reliability purposes.[57] Greenfield natural gas-fired combined cycle units can take one-to-two additional years. Wind farms and solar generating stations can be brought on line in shorter times. Many new renewable power projects and gas-fired power plants do not require new transmission investment (because they are built near existing facilities), and it is possible to upgrade capacity on existing transmission facilities on much-shorter timelines (e.g., 2-4 years) than is required for siting new transmission projects on entirely new right of way.

54. Installations on the customer's side of the meter (e.g., energy efficiency upgrades, demand-response measures, rooftop solar panels) typically come on line in far shorter time periods than three years.[58] With the encouragement and approval of their state regulators, electric utilities have been operating programs for many years that consider such customer-sited measures as alternatives to building new power plants. These projects reduce demand for electricity from the grid, thus supporting the electric system's ability to respond to changes in the system within the timelines anticipated by the Clean Power Plan. Such resources are not only relatively quick to

[57] In 2000, for example, the New York Power Authority successfully undertook a one-year process to obtain permitting approvals and to install 10 gas-turbine peaking plants in and around New York City to avoid reliability problems in the following summer.

[58] For example, in 2003/2004, the grid operator in New England successfully solicited proposals for localized peaking supply and demand response in southwestern Connecticut in order to avoid potential reliability problems during the period it took to build a new transmission line. (Demand response involves voluntary actions that taken by customers on their own premises – i.e., "behind the meter" – to reduce their demand for electricity in response to a signal from the grid operator.) These "gap-RFPs" brought sufficient demand-response resources into the market on a quick-turnaround basis.

bring on line,[59] but they are also relatively inexpensive, abundant and expected to grow even in the absence of the Clean Power Plan[60] (as appropriately assumed in EPA's analyses).

55. Many declarants express a misplaced concern that the lead time required for some compliance strategies, such as the construction of wholly new plants, could force them to make irrevocable commitments in 2016.[61] Their concern is misplaced

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[59] See: Paul Hibbard, Andrea Okie and Katherine Franklin, "Assessment of EPA's Clean Power Plan: Evaluation of Energy Efficiency Program Ramp Rates and Savings Levels," December 2014, available at http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/assessment_of_epa_clean_power_plan.pdf.

[60] See, for example, the findings from a Department of Energy's national laboratory: Galen L. Barbose, et al., "The Future of Utility Customer-Funded Energy Efficiency Programs in the United States: Projected Spending and Savings to 2025," Lawrence Berkeley National Laboratory, January 2013, page 5:

- By 2025, spending on electric and gas efficiency programs … is projected to double from 2010 levels to $9.5 billion in the medium case, compared to $15.6 billion in the high case and $6.5 billion in the low case.
- Compliance with statewide legislative or regulatory savings or spending targets is the primary driver for the increase in electric program spending through 2025, though a significant share of the increase is also driven by utility DSM [demand-side management] planning activity and integrated resource planning.
- Our analysis suggests that electric efficiency program spending may approach a more even geographic distribution over time in terms of absolute dollars spent, with the Northeastern and Western states declining from over 70% of total U.S. spending in 2010 to slightly more than 50% in 2025, and the South and Midwest splitting the remainder roughly evenly.
- Under our medium case scenario, annual incremental savings from customer-funded electric energy efficiency programs increase from 18.4 TWh in 2010 in the U.S. (which is about 0.5% of electric utility retail sales) to 28.8 TWh in 2025 (0.8% of retail sales)."

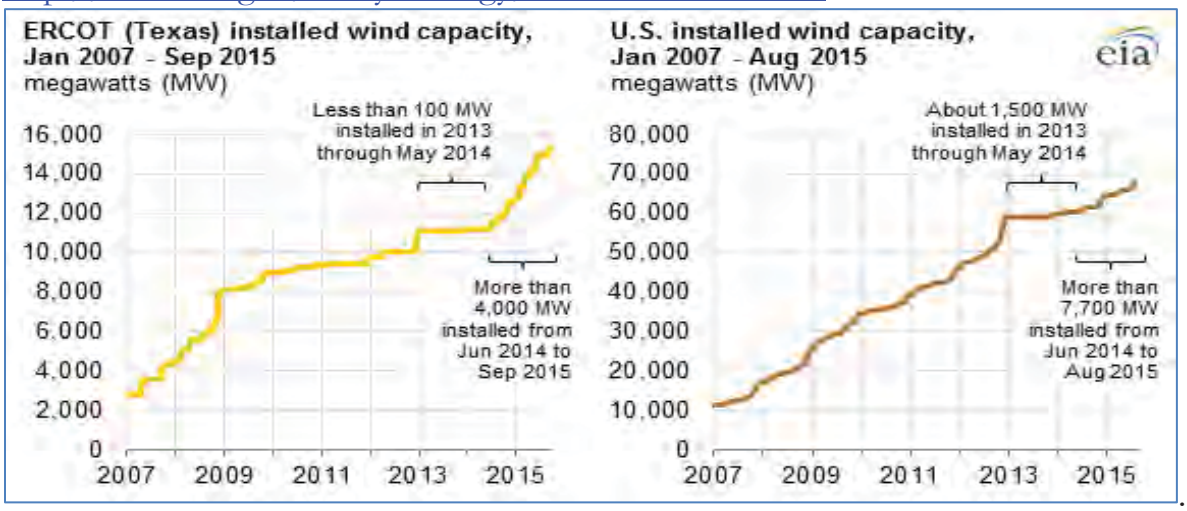
[61] For example, the Lloyd Declaration (Texas) expresses this concern when he imagines the types of actions he thinks power companies will need to undertake during the period of the Court's review of this matter. But without the plan having been developed for Texas, it would be inappropriate to arrive at any of the following

because they are overstating the reasonable lead times required for such projects and understating the amount of flexibility that is available in the Clean Power Plan, which allows power plant owners many other compliance options with even shorter lead times. These flexibilities include, but are not limited to, complying by accessing markets for emissions credits or allowances.

56. Thus, there is ample time for state plan development through 2018, and the information provided by movants does not show that any parties will be forced to make decisions in 2016 that amount to irreparable harm from the Clean Power Plan. Indeed, many power plant owners will find it advantageous to wait until states have determined the architecture of their plans before making compliance decisions. They

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conclusions that he reaches – i.e., that any particular power plant in Texas will have to shut down; that there will need to be new transmission lines, and if so, where they would be needed; that additional capacity is needed in 2022 and thereafter in light of the trends already underway (e.g., new projects in the development cycle; new demand response measures that have been stimulated in the Texas market). Notably, Texas is "expected to keep breaking records for wind generation as wind capacity grows." Energy Information Administration, 'Texas expected to keep breaking records for wind generation as wind capacity grows," November 4, 2015, http://www.eia.gov/todayinenergy/detail.cfm?id=23632.



will have ample time after that to make and implement those compliance decisions given the 2022 start date, the possibility to allow averaging of emissions across years, and the gradual nature of the required emissions reductions. And many power projects are already in the development/permitting/construction pipeline.

57. Contrary to Messrs. Schwartz's and Heidell/Repsher's assertions that coal-plant closure decisions are permanent and irreversible, it is possible to mothball coal-fired power plants and to keep them available to return to service. Mothballing a plant differs from retirement; in the former, owners take steps to preserve a plant's functionality so as to leave open the option for it to return to service in the future. Over my decades of experience in the electric industry, I am aware of countless examples where coal-fired and other fossil-fueled power plants have been mothballed, with some eventually restarting and others eventually closing permanently. Recently, there are many examples of mothballing coal-fired power plants in the U.S. In 2012, for example, when natural gas prices were so low that they were making many coal-fired power plants uneconomical to operate very often, the Wall Street Journal described the plant-mothballing plans of many power plant owners in different parts of the U.S. (e.g., Ohio, Texas, and Pennsylvania).[62] There are also many recent examples of mothballing of natural-gas-fired and coal-fired power plants in other countries, making the point that this technique is technically feasible and in some conditions economically preferable to a decision to permanently shut down a power

[62] Rebecca Smith, "Coal-Fired Plants Mothballed by Gas Glut," *Wall Street Journal*, September 11, 2012, available at http://www.wsj.com/articles/SB10000872396390443696604577645713658834228?alg=y.

plant in the face of uncertainty about power market conditions and regulations in the future.[63] These other countries' situations parallel those in the U.S.

58. A stay would not alleviate the risks associated with power plant investment and retirement decisions, as movants allege. The reason is that power plant owners would still have to consider the risk that this Court ultimately sustains the Clean Power Plan, or that even if this Court remands the rule to address a shortcoming, EPA will reissue a revised rule. For these reasons, many power plant owners and other energy companies have already chosen for many years to consider the prospect of future carbon controls in their decision-making.

59. Many declarants (including Mr. Schwartz and Mr. Lloyd (Texas)) imply that the Clean Power Plan will require a new and unprecedented resource-planning process. This position fails to acknowledge that utilities and other grid operators undertake planning activities *continuously* to ensure grid reliability, and that for decades, electric companies have had to conduct such planning under conditions of uncertainty. This is true under many states' own resource-planning processes for

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[63] Here are recent examples from Germany, the U.K. and Australia: "Germany to mothball largest coal power plants to meet climate targets," *The Guardian*, July 2, 2015, http://www.theguardian.com/environment/2015/jul/02/germany-to-mothball-largest-coal-power-plants-to-meet-climate-targets; Diarmaid Williams, "Mothballed gas-fired power plant re-opened in UK effort to ensure capacity," *Power Engineering International*, October 21, 2015, http://www.powerengineeringint.com/articles/2015/10/mothballed-gas-fired-power-plant-re-opened-in-uk-effort-to-ensure-capacity.html; Angela Macdonald-Smith, "Power plants mothballed as electricity demand dips," *Sydney Morning Herald*, December 10, 2014, http://www.smh.com.au/business/power-plants-mothballed-as-electricity-demand-dips-20141210-124ekv.html.

electric utilities, as well as regulatory policies of the Federal Energy Regulatory Commission (e.g., FERC Order 1000 requires transmission owners to conduct planning with stakeholders on their system (e.g., utility and non-utility owners of power plants)). Thus, power plant owners do not need to start the planning process from scratch to plan for changes in the electricity system as the Clean Power Plan takes effect. Various parties (including grid operators, utility companies, project developers, others) are constantly looking ahead and taking changing economic conditions (e.g., fuel costs) into their planning processes. Even if some infrastructure (e.g., a wholly new transmission line) requires multiple years to construct, there are numerous options to reduce or avoid pollution at high-emitting power plants that do not require long lead times (e.g., through increasing output at existing under-utilized natural gas power plants, developing new peaking power plants, adding 'demand-response' resources, or installing solar panels). Many options (e.g., emission trading) might not necessitate construction of any new infrastructure, at all, because they would permit continued use of an existing high-emitting plant with compensating emission reductions made elsewhere and accessed through emissions trading (which allows for a separation of the "emissions credit" from the actual physical supply of power). Thus, neither states nor industry will be irreparably harmed by any dramatically increased need to engage in planning if the rule is not stayed.

VI. IMPACTS ON ELECTIC SYSTEM RELIABILITY

60. Contrary to suggestions by many state and industry declarants,[64] the electric industry will not experience reliability problems as a result of the Clean Power Plan – either in the near-term period during the Court's review, or during the planning and compliance period that follows. There are several bases for my opinion.[65]

61. First, I have studied and written about the industry's actual historical experience in implementing prior air-pollution-control regulations, where similar reliability concerns were raised before the fact. Such concerns are frequently raised whenever there is major change in the industry (whether due to regulations or other causes). Raising such technical concerns plays an important role in assuring that industry plans for and takes the steps necessary to ensure reliable electric service. There has never been an actual reliability problem that was caused by compliance with air-pollution control (or other environmental regulations). I have written about the absence of reliability problems from environmental regulations on several occasions. For example, I have addressed the recent experience with the EPA's Mercury and Air

[64] For example: Harbert Declaration (Chamber of Commerce et al.); Schwartz Declaration (National Mining Association); Heidell/Repsher Declaration (Utility and Allied Group); Nowak Declaration (Wisconsin); Hyde Declaration (Texas); Lloyd Declaration (Texas).

[65] Note the declarations filed on behalf of environmental movant- intervenors which also address electric system reliability issues: Jon Wellinghoff (former chairman of the Federal Energy Regulatory Commission, which has statutory responsibility for electric reliability); Joseph Kelliher (also former chairman of the Federal Energy Regulatory Commission); and Eric Svenson, a former senior electric utility executive.

Toxics Standard,[66] which went into effect in 2015, with the possibility of extensions for up to two years beyond then.[67] That regulation was a highly prescriptive rule, in that (unlike the Clean Power Plan) compliance lead times were shorter and each generating station had to meet the required emissions standard without the possibility of averaging or emissions trading with power plants at other locations. Before EPA issued that rule in late 2012, countless observers raised concerns that the rule would threaten electric reliability. But it did not. The rule went into effect on April 16, 2015, without incident, because the many players in the electric industry took the steps needed to both comply with the rule and maintain electric system reliability.

62. Second, the electric industry will prepare for implementation of the much more flexible Clean Power Plan with the same robust set of tools to address and avoid reliability problems. As I have written in several recent reports,[68] the standard

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[66] Susan Tierney, "Déjà vu: Pushback to U.S. Clean Power Plan Reminiscent of 2011 Mercury Rule," May 14, 2015, http://www.wri.org/blog/2015/05/d%C3%A9j%C3%A0-vu-pushback-us-clean-power-plan-reminiscent-2011-mercury-rule.

[67] The compliance deadlines for the Mercury and Air Toxics Standard were: "April 2015 for existing generating units. Up to 1-year extension (to April 2016) for installation of controls through permitting authorities possible. Up to 1 additional year possible through Clean Air Act Administrative Order (to April 2017)." Source: U.S. Government Accountability Office, "Update on Agencies' Monitoring Efforts and Coal-Fueled Generating Unit Retirements," August 2014, page 6.

[68] Among these many recent reports are: Susan Tierney, Paul Hibbard and Craig Aubuchon, "Electric System Reliability and EPA's Clean Power Plan: Tools and Practices," February 2015. http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/electric_system_reliability_and_epas_clean_power_plan_tools_and_practices.pdf; and Susan Tierney, Eric Svenson, and Brian Parsons, letter and report to Chairman Norman Bay, Federal Energy Regulatory Commission, re: Ensuring Electric Grid Reliability Under the Clean Power Plan: Addressing Key Themes from

reliability practices that the industry and its regulators have used for decades are a strong foundation from which any reliability concerns about the Clean Power Plan will be addressed. (These tools include, among many other things, mechanisms to prevent the retirement of a power plant that is needed for local reliability purposes.)

63. Third, the Clean Power Plan includes numerous design features that together provide ample flexibility to assure that reliability is maintained at all times. Initial compliance begins seven years from now (2022), which provides sufficient time to introduce new assets into the electric resource mix. Once the compliance period begins, individual generating units in a state may average their emissions over a three-year period to demonstrate compliance with emissions targets – allowing for operating flexibility under conditions that could otherwise introduce reliability problems. The flexibility that EPA has granted states in designing Clean Power Plan implementation plans leaves the door wide open for states to propose in their plans specific mechanisms needed to ensure that compliance does not compromise system reliability. (For example, this could include emission-averaging across power plants in the state and in other states. EPA's proposed Federal Plan would also allow for emissions averaging across generating units, so that this would also occur in states electing not to file a state plan.) The Clean Power Plan includes a "reliability safety valve," which would allow generators to operate out of compliance with emission limits for up to a 3-month period of time in order to mitigate potential local reliability

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the FERC Technical Conferences, Docket No AD15-4, April 17, 2015, http://www.eenews.net/assets/2015/04/20/document_gw_02.pdf.

problems. In including the reliability safety valve in the final Clean Power Plan rule, the EPA stated that it was acting out of an abundance of caution so as to assure the public officials, the electric industry, and electricity consumers that it would not allow carbon-emission reduction requirements to jeopardize electric system reliability. For these reasons, Declarant Schwartz's (and Declarant Patton's) focus on the Mercury and Air Toxics Standard is completely irrelevant for understanding the impacts of the Clean Power Plan, because the latter contains the many above-mentioned flexibilities that are not present in the much more prescriptive Mercury and Air Toxic Standard.

64. Fourth, contrary to Mr. Schwartz's position and for reasons I have already explained, no power plant owner will be compelled to retire a plant needed to maintain reliability in 2016 or 2017 by an emission standard that goes into effect many years later. Likewise, no specific new investments (e.g., proposals to build new electric transmission or approvals of new plants) need to be taken during the period of the Court's review to preserve reliability, given the lengthy compliance phase-in and substantial renewable energy and natural gas development and transmission expansion already in the pipeline.

65. Fifth, and finally, the electric industry is dynamic, with myriad systems and processes designed to respond and adapt to changes and risks. The market is already responding to signals that additional electric resources are needed to replace old ones for a variety of reasons. Many projects have come forward: new power plants, upgraded transmission facilities, rooftop solar panels, energy efficiency measures, and energy management systems. These varied responses are the norm, collectively maintaining reliability and modernizing the power system along the way. Given these

changing elements of the electric system around the country (and in light of the fact that states have not yet registered their preferred approach for bringing the power plants in their states into compliance with the Clean Power Plan), it is premature to know what additional system elements (e.g., new transmission upgrades or power lines; new power plants, or new natural gas pipelines) will be needed. Thus, this Court should not give weight to the assertions of declarants that there will not only be reliability risks but also transmissions plans and approvals of power plants needed during the pendency of this Court's review.

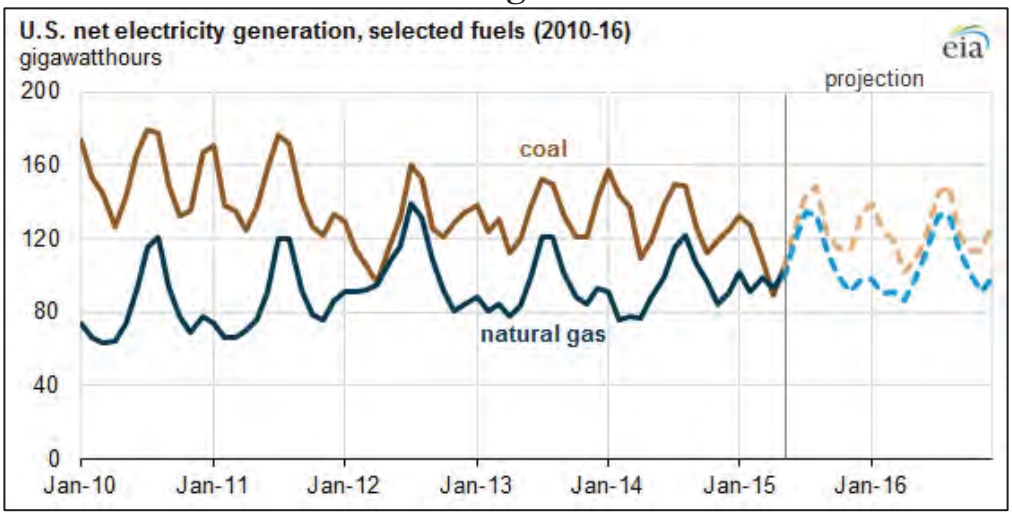
VII. IMPACTS ON THE COAL INDUSTRY

66. Contrary to the position taken by National Mining Association Declarants (including Mr. Schwartz), the changes underway in the nation's coal industry have mainly to do with large changes in market conditions in recent years: higher costs of mining coal, competition from declining natural gas prices and renewable power costs, lower demand for coal, and an oversupply of coal production. These fundamental market-driven trends are not likely to reverse in the near term, and have reduced the amount of coal consumed in electricity generation and led to sharply lower valuations and stock prices for coal companies. These near-term trends and anticipated continued outlook of unfavorable conditions in the market for coal cannot be tied to the Clean Power Plan. Rather, they stem from market conditions, other environmental regulations with nearer-term deadlines, and investors' expectations over many years that there will eventually be limits on power-sector carbon emissions. The Schlissel and Sanzillo Declarations on behalf of the environmental movant-

intervenors discuss these market trends in detail. Staying the Clean Power Plan would not change these independent pressures on the coal industry.

67. I have previously written about the impacts of various factors on the electric industry's demand for power production at coal-fired generation facilities.[69] Note that as shown in Figure 7 and as recently as 2010, coal was the dominant fuel used for power production; coal then accounted for nearly 50 percent of all U.S. electricity generation. Natural gas-fired generation exceeded coal generation for the first time only in April 2015.[70]

Figure 7



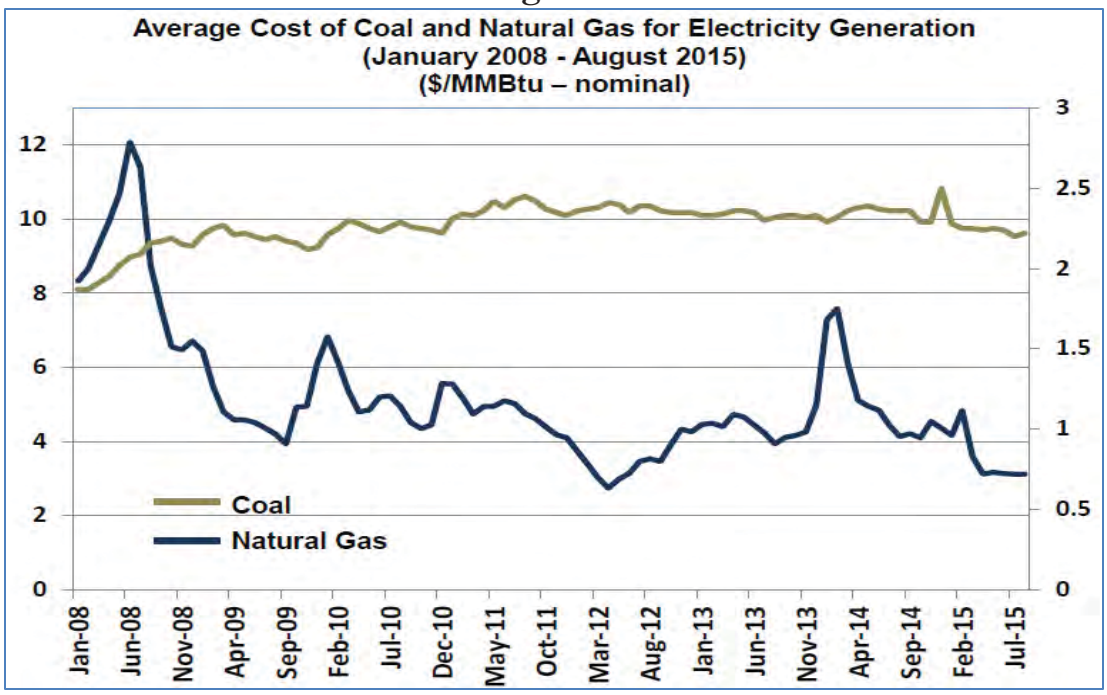
Source: Energy Information Administration.

[69] Susan Tierney, "Why Coal Plants Retire: Power Market Fundamentals as of 2012," February 16, 2012, available at http://www.analysisgroup.com/uploadedfiles/content/news_and_events/news/2012_tierney_whycoalplantsretire.pdf.

[70] U.S. Energy Information Administration, "Electricity from natural gas surpasses coal for first time, but just for one month," July 31, 2015, available at http://www.eia.gov/todayinenergy/detail.cfm?id=22312.

68. In the last decade, several things have happened to cause the decline in coal's share of electricity production. Foremost is the so-called shale gas revolution, in which directional drilling and hydraulic fracturing have enabled natural gas production at much lower cost and higher volumes.[71] After 2008, natural gas prices have been low, relative to past prices for gas and relative to coal prices to the power sector (as shown in Figure 8, below).

Figure 8

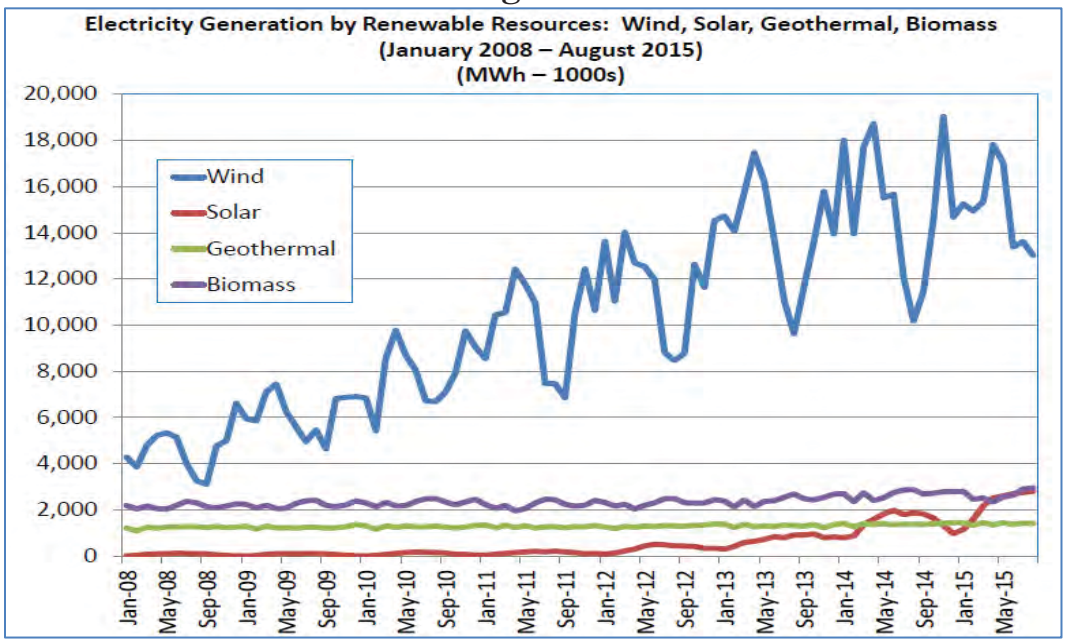


Source of data: Energy Information Administration, Electricity Data Browser.

[71] See the description of the 'shale gas revolution,' in the National Petroleum Council's 2011 study on North American natural gas and oil, "Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources," National Petroleum Council, 2011. I was one of the co-authors of this report, and I served as the Chair of the Policy Subgroup for this study. Additionally, I served on the six-person Secretary of Energy Advisory Board's Shale Gas Subcommittee, and co-authored two reports on shale gas development.

69. Also since 2008, demand for electricity has been relatively flat, as a combined result of conditions in the economy, increased energy efficiency in buildings and appliances in buildings, and increased output from renewable generating units. (See Figure 9.) Because renewable resources (e.g., wind, solar, and geothermal) have low operating costs relative to fossil fuels, these facilities tend to be dispatched for generation whenever they are available. This has meant that while total electricity demand has remained relatively flat, the share of coal has been reduced by competition from both natural-gas-fired and renewable generation.

Figure 9

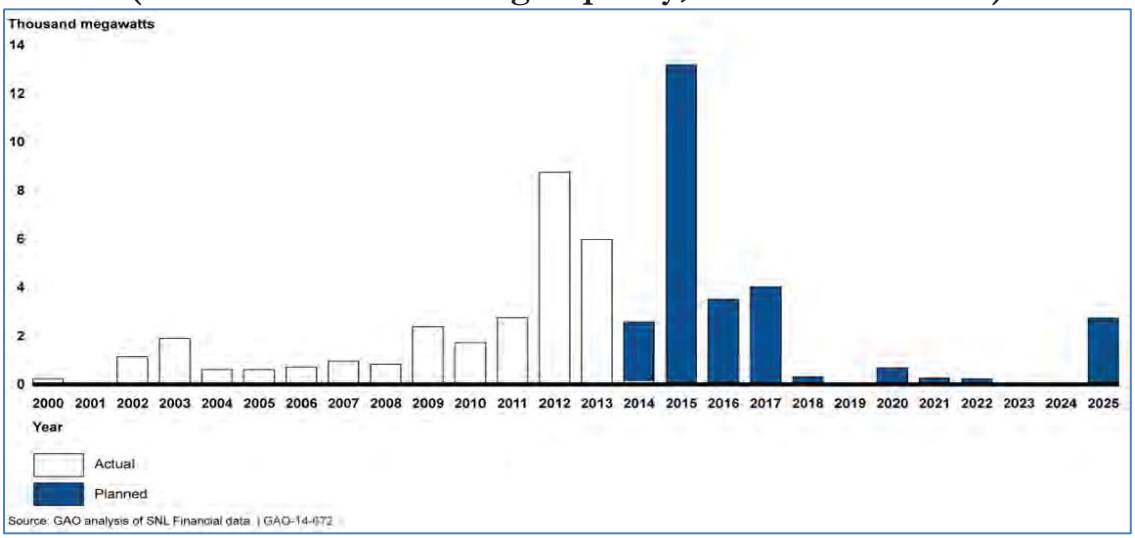


Source of data: Energy Information Administration

70. Demand for coal is also down because of retirements of coal-fired power plants during this same period. Figure 10 shows the actual and anticipated retirements of coal-fired generating capacity as of mid-2014, based on a study by the U.S. Government Accountability Office, which reported that most retirements were

due to low natural gas prices and other industry trends, together with pre-Clean Power Plan environmental regulations.

Figure 10
Actual and Planned Retirements of Coal-Fueled Electricity Generating Units, 2000-2025 (as of August 2014)
(Net Summer Generating Capacity, Thousands of MW)



Source: Government Accountability Office, "Update on Agencies' Monitoring Efforts and Coal-Fueled Generating Unit Retirements," August 2014, Figure 1.

71. Thus, the demand for coal-fired generation (and in turn, for coal production) has been in a prolonged decline, well before the advent of the Clean Power Plan. In 2015 alone, output significantly shifted from existing coal-fired plants to gas-fired power plants, as shown in Figure 11. "Larger coal burning states that have notably reduced their coal-fired generation while increasing their natural gas-fired generation in 2015…Coal plant retirements / conversions and compliance with [pre-Clean Power Plan] emissions standards have also been drivers of switching in 2015."[72]

[72] Thomas Wadewitz, UBS Global Research, "UBS: US Railroads: Nat Gas Capacity Adds, Coal Retirement Mapping, & Other Analysis to Frame the Rail Coal

Figure 11
Changes in Coal-Fired versus Natural-Gas-Fired Generation by State Relative to Generation in the Prior Year (January 2015 through August 2015)

State	% of US Coal Gen	Coal	Nat Gas	State	% of US Coal Gen	Coal	Nat Gas
AL	3.0%	-5.4%	6.7%	MT	1.1%	3.4%	0.8%
AZ	2.5%	-5.1%	3.5%	NE	1.7%	0.1%	0.1%
AK	0.0%	0.3%	-2.7%	NC	3.3%	-5.9%	6.4%
AR	1.6%	-16.4%	12.0%	NH	0.1%	-2.3%	5.4%
CA	0.0%	-0.2%	-2.6%	NV	0.2%	-14.2%	13.2%
CO	2.3%	0.8%	-0.6%	ND	2.0%	1.4%	0.1%
CT	0.1%	-0.7%	0.8%	NJ	0.1%	-1.8%	4.0%
DE	0.1%	-6.5%	7.1%	NM	1.4%	0.5%	0.8%
FL	3.1%	-4.4%	4.0%	NY	0.2%	-2.1%	1.3%
GA	3.0%	-7.7%	8.0%	OH	5.4%	-7.2%	5.1%
HI	0.1%	-1.4%	0.0%	OK	1.8%	-8.6%	6.7%
IA	2.3%	-2.0%	1.7%	OR	0.1%	-1.7%	7.6%
ID	0.0%	0.0%	6.1%	PA	5.1%	-5.6%	3.8%
IL	5.5%	-3.7%	2.6%	RI	0.0%	0.0%	-0.8%
IN	5.8%	-9.0%	7.6%	SC	1.8%	-6.2%	3.1%
KS	1.9%	-1.8%	0.3%	SD	0.1%	-16.3%	4.7%
KY	5.4%	-2.2%	1.2%	TN	2.4%	-5.9%	3.8%
LA	1.1%	-3.7%	5.3%	TX	8.7%	-7.5%	6.9%
MA	0.2%	-2.8%	5.9%	UT	2.2%	1.0%	-0.2%
MD	1.1%	-6.8%	4.7%	VT	0.0%	0.0%	0.1%
ME	0.0%	0.1%	-11.1%	VA	1.3%	-6.4%	11.5%
MI	3.8%	-3.7%	4.8%	WA	0.3%	-1.8%	1.7%
MN	1.8%	-3.1%	6.6%	WV	5.0%	-1.5%	1.0%
MO	4.7%	-3.7%	1.5%	WI	2.7%	-6.5%	7.7%
MS	0.5%	-10.6%	9.7%	WY	3.0%	1.4%	0.3%
				US-TOTAL	100.0%	-5.2%	4.9%

Note: A negative number reflects a reduction in generation relative to the prior year.
Source: Thomas Wadewitz, UBS Global Research, "UBS: US Railroads: Nat Gas Capacity Adds, Coal Retirement Mapping, & Other Analysis to Frame the Rail Coal Headwind," November 6, 2015.

72. This trend is likely to continue through the Court's review period, because of continued relatively flat electricity demand, low natural gas prices, increasing supply of renewable generating resources, and near-term coal-plant retirements. Despite these trends, Declarant Schwartz assigns the still-distant Clean Power Plan with sole responsibility, contending that it "will result in a fundamental restructuring of the U.S.

Headwind," November 6, 2015, https://neo.ubs.com/shared/d1p41mFXOoOVNm/.

power sector"[73] and that EPA's rule is largely if not solely responsible for lower stock prices and financial challenges of companies producing coal and other impacts "on coal companies, their employees, and the states and local communities that are dependent on the coal industry."[74] But as shown above, these trends have other market and regulatory causes and have been underway for some time.[75]

73. In light of the challenging economic and financial conditions in the coal industry, Mr. Schwartz's concerns about how long it takes to construct new coal mines[76] seem extraordinarily misplaced. Notably, the President of West Virginia's largest electric utility, Appalachian Power (whose power plant fleet is 70 percent coal-fired capacity[77]) recently stated: "'With or without the Clean Power Plan, the economics of alternatives to fossil-based fuels are making inroads in the utility plan,' …. 'Companies are making decisions today where they are moving away from coal-fired generation.'"[78]

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[73] Schwartz Declaration, page 2 and elsewhere.
[74] Schwartz Declaration, pages 4-5 and elsewhere.
[75] See: Lee Buchsbaum, "The Shifting Fates of Coal Markets, Coal Mining, and Coal Power," *Power Magazine*, October 1, 2015, http://www.powermag.com/the-shifting-fates-of-coal-markets-coal-mining-and-coal-power/
[76] Schwartz Report (attached to Schwartz Declaration), pages 48-51.
[77] Appalachian Power Fact Sheet, https://www.appalachianpower.com/global/utilities/lib/docs/info/facts/factsheets/APCO-FactSheet-October2015.pdf.
[78] Charles Patton quote from article by David Gutman, "Coal not coming back, Appalachian Power president says," *West Virginia Gazette*, Tuesday, October 27, 2015, http://www.wvgazettemail.com/article/20151027/GZ01/151029546/1419. (Note that this is the same Mr. Patton who has filed a declaration on behalf of the Utility and Allied Group movants.) Further, the article states that "Patton acknowledged that entire communities, particularly across Southern West Virginia, are being decimated by coal's decline. However, he laid out a series of stark economic realities. By 2026, Patton said, Appalachian Power expects its use of coal power to be down 26 percent,

VIII. IMPACTS ON ELECTRICITY CONSUMERS

74. Petitioners make dire claims about compliance costs and ratepayer impacts. In doing so, they ignore the cost trends in power supply options that are available in the market as alternatives to coal, even in the absence of the Clean Power Plan. In addition to the availability of significant quantities of under-utilized natural gas capacity that exists at present, the four energy technologies/resources that provide economical supply with advantageous attributes to the future power system are: energy efficiency, natural-gas fired generation, on-shore wind, and utility-scale solar. (Other technologies – e.g., storage – offer attractive features in a variety of market conditions, so the four technologies/resource types that I mention are not meant to be exclusive.) As observed in the most recent report (Fall 2015) by Lazard, which annually analyzes the "levelized cost of energy"[79] of different technologies, "[d]espite recent sharp declines in the market price of natural gas, utility-scale solar and wind power remain cost-competitive, even without subsidies." Figure 12 displays the most-recent levelized cost data published by Lazard. In the figure, electric options (shown on the rows) with cost information toward the left-hand side have lower

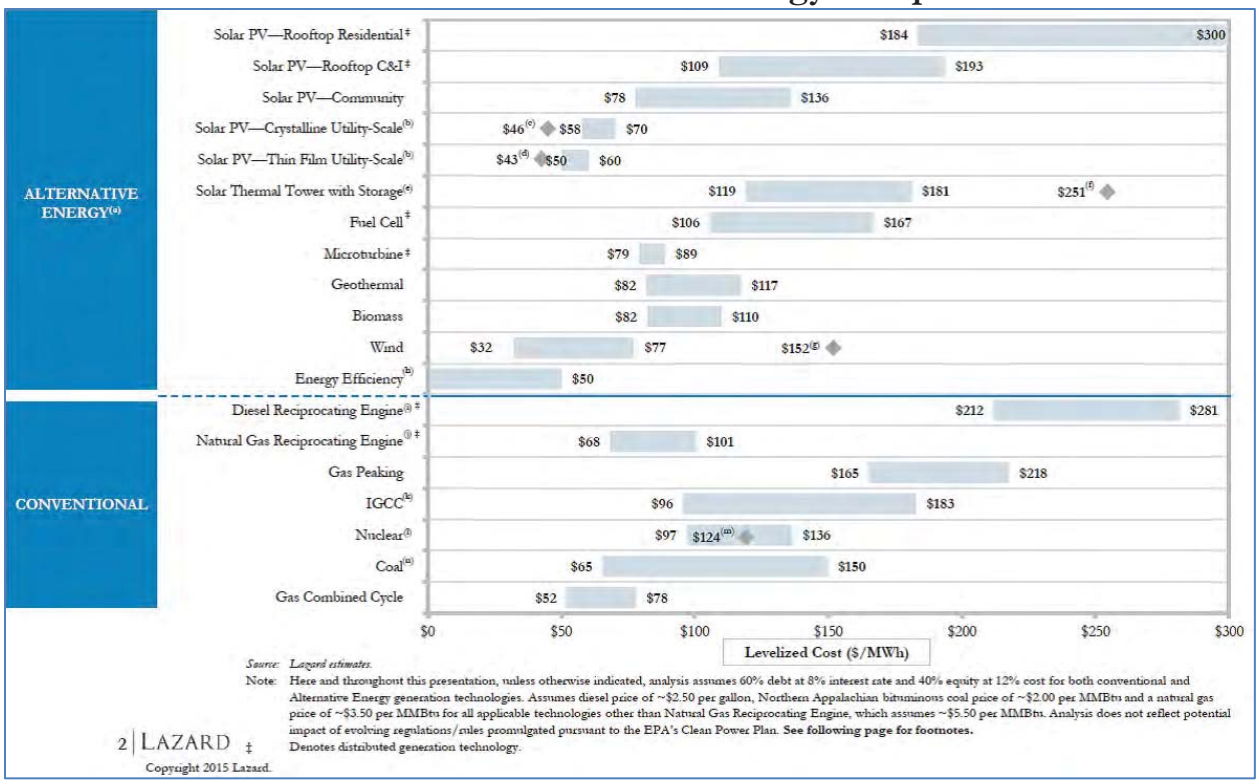
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with or without the Clean Power Plan. That's because of cheaper alternatives and already-imposed environmental regulations that make coal uncompetitive, Patton said."

[79] The "levelized cost" of energy (or electricity) is equivalent to an amount which, over the life of a generating unit or contract, incorporates the total cost of producing power, including capital costs to purchase equipment and construct the plant, the costs to finance the project, the costs to operate and maintain it over its life, and all other costs associated with producing power (e.g., fuel costs, emission allowance costs). Levelized costs are typically presented on a dollar-per-megawatt-hour ($/MWh) basis.

levelized cost data.[80] Note that energy efficiency (shown on the last row under "Alternative Energy") has the lowest levelized cost, with wind, utility-scale solar, and natural gas combined cycle technologies having the next lowest levelized costs.

Figure 12
Unsubsidized Levelized Cost of Energy Comparison[81]



[80] Lazard relies upon a leading consulting and engineering firm to provide the data, which Lazard then augments with its own commercial knowledge where relevant and with input from a wide variety of industry participants. "Lazard's Levelized Cost of Energy Analysis, Version 9.0," 2015, available at https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf. Further, Lazard states that the levelized-cost figures reflect the current state of generation technologies and do not reflect compliance cost for (or value associated with) carbon controls.

[81] "Lazard's Levelized Cost of Energy Analysis, Version 9.0," 2015, available at https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf.

75. Notably, the movant declarants underplay the critical role that energy efficiency also plays in mitigating cost increases in the electric industry. EPA's final Clean Power Plan does not incorporate an end-use energy-efficiency component (or building block) into the determination of the Best System of Emission Reduction and the calculation of the CO_2 emissions performance rates EPA established for coal and gas power plants. But EPA did clarify in the Final Rule that states may incorporate energy efficiency into their state plans, if they elect to submit them. Likewise, power plant owners can invest in energy efficiency as way to create carbon-dioxide emission-reduction credits (in rate-based plans), or to reduce electricity demand and thereby reduce carbon-dioxide allowance prices (in mass-based plans). States can assist in mobilizing energy efficiency by establishing or expanding utility-run or third-party energy-efficiency programs supervised by public utility commissions. Even if states do not create these programs, there are already substantial marketplace opportunities for power companies to invest in energy efficiency in homes and businesses, helping electricity customers lower their electric bills while earning emission-reductions credits that can be used for compliance with Clean Power Plan emission limits. (See the Illinois Utility Board declaration on behalf of the environmental movant-intervenors.)

76. Much has been written about the cost-effectiveness of energy efficiency investments (also known as "energy productivity"[82]) – that is, investments to reduce the energy-using profile of buildings, appliances, industrial processes, and the

[82] Energy productivity refers to the economic value per unit of energy used, and is a different way to characterize the outcomes of many types of investments and measures that increase the energy efficiency of electricity production and use.

generation/delivery of electricity itself.[83] For decades, energy efficiency has been recognized as the most cost-effective way to meet electricity needs (providing the same quality of heating, cooling, lighting, computer capabilities, and so forth, with less energy). Many states have established public utility commission-supervised programs to deliver energy efficiency savings to electricity customers. Utilities supply their customers with energy-saving goods and services (e.g., rebates to reduce the cost of replacing old appliances with energy efficient ones), and in some states earn a rate of

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[83] See, for example:

- Steven Nadel, et al., "Energy Efficiency in the United States: 35 Years and Counting," American Council for an Energy-Efficient Economy ("ACEEE"), June 2015.
- Paul Hibbard, et al., "Assessment of EPA's Clean Power Plan: Evaluation of Energy Efficiency Program Ramp Rates and Savings Levels," December 2014.
- Electric Power Research Institute ("EPRI"), "U.S Energy Efficiency Potential Through 2035," 2014 Technical Report,
- Alliance Commission on National Energy Efficiency Policy, "Doubling U.S. Energy Productivity," February 7, 2013.
- Rhodium Group, "American Energy Productivity: The Economic, Environmental and Security Benefits of Unlocking Energy Efficiency," February 2013.
- Institute for Electric Efficiency, "Assessment of Electricity Savings in the U.S. Achievable through New Appliance/Equipment Efficiency Standards and Building Efficiency Codes (2010-2025)," IEE Whitepaper, May 2011.
- The National Academy of Sciences, "Real Prospects for Energy Efficiency in the United States," 2010.
- EPRI, "Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010-2030)," January 2009.
- Diana Farrell, et Al., McKinsey, "The Case for Energy Productivity," 2008.
- National Action Plan for Energy Efficiency, July 2006.
- Steven Nadel, et al., "The Technical, Economic, and Achievable Potential for Energy Efficiency in the United States: A Meta-Analysis of Recent Studies," ACEEE, 2004.

return paid by customers in their electricity bills. Investments in these programs increased to nearly $6 billion in 2012, a 28-percent increase in just three years. Incremental electricity savings reported by the states have increased by approximately 120 percent over the same period.[84] State energy-efficiency investments "regularly save customers over $2 for every $1 invested, and in some cases up to $5….Over the past decade, efficiency has remained the least-cost option for utilities, with levelized costs to utilities ranging from 2 to 5 cents per kilowatt hour, about one-half to one-third the cost of new electricity generation options."[85]

77. EPA assessed the potential of energy efficiency as the agency developed its original Clean Power Plan proposal and concluded that every state could eventually achieve annual incremental energy savings of at least 1.5 percent of retail sales each year. This is amply supported by relevant studies. "EPA's observation of state achievable energy efficiency potential savings equal to (on average) 1.5 percent of state retail sales is squarely within the range of results (0.3 percent to 2.9 percent) analyzed by [the American Council for an Energy Efficient Economy] ACEEE in its recent full meta-analysis of [energy efficiency] EE potential."[86] Also, the "successful

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[84] ACEEE, "2013 State Energy Efficiency Scorecard," November 2013, pages 19, 27, 30-31.

[85] See, for example, Nicholas Bianco, et al.., "Seeing is Believing: Creating a New Climate Economy in the United States," World Resources Institute, October 2014, page 52.

[86] Paul Hibbard et al., "The Economic Potential of Energy Efficiency: A Resource Potentially Unlocked by the Clean Power Plan," December 1, 2014, page 5, describing the results of a literature review of studies relied upon by EPA and by other organizations in estimating the potential to make deeper efficiency gains in electricity use. See also Max Neubauer, "Cracking the TEAPOT: Technical, Economic, and

demonstration of states' ability to meet aggressive ramp rate and/or sustained savings levels holds true across a wide cross-section of states and delivery mechanisms, representing different electric industry structures; different electricity costs; different parts of the country with different climates and electricity needs; different mixes of residential, commercial, and industrial customers; and vastly different modes of EE program implementation (e.g., by utilities, compacts/associations, state agencies; and third-party contractors)."[87]

78. The declarants' claims that the Clean Power Plan will increase consumers' electricity bills assume that neither states nor power companies will adopt these least-cost compliance strategies, even though these measures effectively reduce power plants' CO_2 emissions and the Clean Power Plan expressly allows them to count for compliance.

79. But even if states do not elect to adopt energy efficiency policies to mitigate any impacts of carbon emissions on consumers' electricity bills, the impacts will be reasonable, contrary to the claims of declarants (such as Declarant Alford, filed on behalf of Peabody Coal). Whatever costs will be incurred to comply with the Clean Power Plan, these costs will be reasonable for many reasons: first, because compliance costs are many years away, not during pendency of litigation; second, because of the relatively attractive costs associated with incremental supply from

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Achievable Energy Efficiency Potential Studies," ACEEE, Report U1407, August 2014; and ACEEE, "Change is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution" Report E1401, April 2014.

[87] Paul Hibbard, et al., "Assessment of EPA's Clean Power Plan: Evaluation of Energy Efficiency Program Ramp Rates and Savings Levels," December 2014, page 7.

energy efficiency, existing and new natural-gas fired generation, incremental wind and utility-scale solar generation; and third, because of the design features of the Clean Power Plan which encourage flexible and efficient compliance strategies by states and the affected electric generating units.

IX. OTHER IMPACTS ON THE PUBLIC INTEREST: RISK OF HARM TO INTERNATIONAL NEGOTIATIONS

80. Finally, based on my prior experience as the Assistant Secretary for Domestic and International Energy Policy for the U.S. Department of Energy and my involvement in clean energy initiatives affecting China, India, and other countries for approximately 20 years, I conclude by pointing out the adverse impact that a stay of the Clean Power Plan would have on international cooperation on climate change. In particular a stay would undermine the willingness of China and other nations to follow through on commitments made bilaterally with the United States and in international negotiations. I note that the declaration of former Secretary of State Madeleine Albright (filed on behalf of the environmental movant-intervenors) clearly states the negative implications of a stay for such international agreements, as does the declaration of Todd Stern, Special Envoy for Climate Change at the U.S. Department of State (filed on behalf of the EPA).

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 8th day of December, 2015, in Boston, Massachusetts.



Susan F. Tierney, Ph.D.

Appendix

Biography of Susan F. Tierney, Ph.D.

Susan Tierney is a Senior Consultant at Analysis Group, an economic, financial, and business strategy consulting firm with more than 600 professionals, with offices in Boston and 10 other cities in the U.S., Canada, and China. She is the lead consultant for many of Analysis Group's engagements relating to the electric and natural gas industries.

Over her 30+-year career as a regulator, policymaker, professor, consultant, and expert witness, she has been directly involved in issues relevant to this matter: implementing utility and environmental statutes and regulation; economic analysis of issues affecting electric utilities, wholesale power markets, and utility rates; economic modeling of power systems; electric system reliability; the design of environmental policies to control air pollution from the power sector; and the implications of different policy designs for costs to power producers and to consumers.

She previously served as the Assistant Secretary for Policy at the U.S. Department of Energy, a Senate-confirmed Presidential appointment. Before that, she held senior positions in the Massachusetts state government as: Secretary of Environmental Affairs (cabinet officer reporting to the Governor); Commissioner of the Department of Public Utilities; Executive Director of the Energy Facilities Siting Council; and Senior Economist for the Executive Office of Energy Resources. While in state government, she was a member of the EPA Clean Air Act Advisory Committee and a founding member of the multi-state Ozone Transport Commission. In those positions she had direct experience in planning for, designing, and implementing state and federal energy, utility-regulatory, air, and water pollution statutes and regulations. She was appointed to those positions by elected officials from both political parties.

Prior to her work in state and federal government, she was an assistant professor at the University of California at Irvine, and she taught a course at the Massachusetts Institute of Technology (MIT). She has lectured at the law schools and graduate schools of numerous universities, including Harvard University, Yale University, MIT, New York University, Tufts University, Cornell University, Northwestern University, and the University of Michigan.

She holds a Ph.D. in regional planning (1980) and a Masters in Regional Planning (1976), both from Cornell University. She has authored numerous articles, reports and analyses; spoken frequently at industry conferences; and served on a number of boards of directors of publicly traded companies and non-governmental organizations. She chairs the External Advisory Council of the National Renewable Energy Laboratory. She was a member of the Secretary of Energy's Advisory Board, and is now a member of another Department of Energy federal advisory committee (the Electricity Advisory Committee). She has served on several National Academy of Sciences expert panels relating to energy industries (including on electric system reliability); and was the co-lead author of the energy chapter of the National Climate Assessment. She was recently the U.S. representative on an independent expert panel to review the multi-lateral Clean Energy Ministerial initiatives, and has served for years as a member of the Policy Advisory Committee of the China Sustainable Energy Project. She has previously testified before utility regulatory agencies in many states, the Federal Energy Regulatory Commission, the U.S. Congress, state legislatures, arbitration panels, and as an expert witness in proceedings before federal and state courts.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

DECLARATION OF DALLAS BURTRAW AND JOSHUA LINN

Introduction and Qualifications

We, Dallas Burtraw and Joshua Linn, jointly declare as follows:

1. I, Dallas Burtraw, am a Senior Fellow at Resources for the Future. I have studied electricity restructuring, competition, and economic deregulation and incentive-based approaches for environmental regulation. I have substantial professional experience with modeling the impacts of power sector clean air regulation, and am familiar with the model used by EPA in this rulemaking. I have published dozens of peer-reviewed articles in the scholarly literature focusing on various aspects of the electricity industry. I have also served on several federal and state advisory committees including the National Academy of Sciences Board on Environmental Studies and Toxicology and the U.S. Environmental Protection Agency's Advisory Council on Clean Air Compliance Analysis. In 1989 I earned a

PhD in economics and in 1986 earned a Master in Public Policy degree from the University of Michigan.

2. I, Joshua Linn, am a Senior Fellow at Resources for the Future. I have researched the effect of environmental regulation and market incentives on technology in the electricity sector. I am also familiar with modeling of power sector clean air regulation, including the model used by EPA in this rulemaking. I have compared the effectiveness of cap and trade and alternative policy instruments in promoting new technology, including renewable electricity technologies in the electricity sector. I have studied the effects of natural gas prices on power plant investment and operation. I have published dozens of peer-reviewed scholarly articles in leading general interest and field journals in environmental, energy, and health economics. I served as a Senior Economist at the Council of Economic Advisers from 2014-2015. Before joining Resources for the Future, I was a Research Scientist at the Massachusetts Institute of Technology and an Assistant Professor of Economics at the University of Illinois at Chicago. I earned a PhD in economics from the Massachusetts Institute of Technology. Together, we share 35 years of experience in analysis of regulatory and policy design addressing the environmental performance of the electricity industry.

3. Resources for the Future has periodically received funding from the Environmental Protection Agency, and from the Department of Energy through the National Renewable Energy Laboratory to conduct research on the electricity sector, including funding related to analysis of the Clean Power Plan. We were not involved in EPA's Integrated Planning Model analysis of the Clean Power Plan. Funding from

EPA and DOE represents a small fraction of Resources for the Future's budget. Resources for the Future also receives funding from energy companies including electricity generators and electric utilities for general and program support.

4. To prepare this declaration, we have reviewed: EPA's Clean Power Plan; EPA's Regulatory Impact Analysis for the Clean Power Plan and the modeling in support of it; the Declaration of Seth Schwartz and attached report in support of the National Mining Association; the Declaration of Reid Harvey in support of Respondent EPA's Opposition to Motions for Stay; the Declaration of Harry Alford, and additional materials cited in this declaration.

5. We are providing this declaration at the request of the public health and environmental movant-intervenors.

Summary of Opinion

6. The purpose of this declaration is to provide information to the court concerning stay movants' and declarants' misuse of EPA's modeling results to claim irreparable injury. In particular, this declaration will: (1) place EPA's standards and modeling results in the context of recent power sector trends; (2) explain how the Integrated Planning Model, used by EPA in this rulemaking, works and how its results can and cannot be used; (3) assess the movants' claims of immediate irrevocable impacts on the utility industry made based on these modeling results; (4) present additional modeling results that confirm that regulated entities can achieve compliance with EPA's rule without taking any action during the consideration of this case; and (5) review additional economic studies cited by movants.

7. Our central opinions are as follows. First, the Clean Power Plan will not require any dramatic restructuring of the electricity sector. It achieves carbon dioxide pollution reductions by continuing trends that are already underway. Second, it is our opinion that the Clean Power Plan, which does not go into effect until 2022, will not cause significant coal plant retirements in 2016. In this regard, we disagree with the claims made by the National Mining Association's declarant Seth Schwartz. The Integrated Planning Model is the best tool available for the purpose EPA used it – to show longer-term response of the electricity system to a policy. It is not reasonable to claim, as Schwartz does, that these modeling results provide a reliable indicator of near-term (2016) unit-level retirement decisions caused by standards that commence in 2022.

A. The Clean Power Plan Continues Recent Power Sector Trends

8. Stay movants argue that the Clean Power Plan will immediately and dramatically restructure the electricity system. This is not the case. For several years, the power sector has been undergoing a significant shift away from highly polluting coal generation and towards lower carbon energy sources, including natural gas, renewable energy, and energy efficiency. When it goes into effect in 2022, the Clean Power Plan will continue this shift. The Clean Power Plan's emission reduction schedule is gradual enough that the decline in carbon pollution required between 2022 and 2030 is no faster than the decline that occurred over the past several years.

9. The recent shift away from coal power generation is due to a number of factors unrelated to EPA's rule. The first is the major decline in natural gas prices.

Natural gas prices have fallen significantly since a high of $9 per million British thermal units (MMBtu) in 2008, and are expected to remain below $4 per MMBtu through at least the next five years, and possibly into the 2020s.[1] The decline in natural gas prices has led to significant increases in generation from natural gas combined cycle plants and a decline in the use of coal at existing facilities. Since 2007, coal generation has declined by 21 percent and natural gas generation has increased by 25 percent,[2] leading to what one coal producer recently defined as a "significant, permanent" shift in market share from coal to natural gas.[3] This transition occurred rapidly, primarily through a shift to existing natural gas combined cycle power plants. Between 2008 and 2012 the nation-wide average utilization rate of all natural gas combined cycle plants increased from 40 to 51 percent, and in some regions the utilization rates increased far more quickly than that—by almost 60 percent in just two years in Pennsylvania, for example. The U.S. power sector built close to 45 gigawatts (GW) of new natural gas combined cycle plants between 2005 and 2013,

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[1] The prices referenced here are the prices at the Henry Hub, one of the most important pricing locations for natural gas. Historical data are obtained from Energy Information Administration, "Henry Hub Natural Gas Spot Price," *available at:* https://www.eia.gov/dnav/ng/hist/rngwhhdA.htm.
Future prices are obtained from SNL Energy, *available at*: https://www.snl.com/SNLWebPlatform/Content/Commodities/CommoditiesWatchlist.aspx?Watchlist=a618b791-2633-411c-9b63-e648c87729f2 (NYMEX and CME Clearport market data provided by DTN).

[2] Energy Information Administration, "Monthly Energy Review," October 27, 2015, *available at:* http://www.eia.gov/electricity/data.cfm#generation.

[3] SNL Energy, "Coal producers deal with 'significant, permanent' structural shift in power supply," October 29, 2015, https://www.snl.com/InteractiveX/Article.aspx?id=34339067.

which is a rate of construction far greater than what EPA has projected between now and 2030 under the Clean Power Plan.

10. A second important factor is the dramatic decline in renewable energy costs and the improvement in renewable energy performance in recent years, resulting in greater generation from these sources. These changes are well recognized and consistent with the price declines that occur as new technology is advancing.[4] Since 2009, the cost of producing electricity from utility-scale solar projects has declined by about 82 percent, from $360 per megawatt hour (MWh) to $64 per MWh in 2015.[5] Similarly, the cost of producing electricity from onshore wind projects has fallen from $135 per MWh in 2009 to $55 per MWh in 2015.[6] Although levelized costs are not the perfect basis for comparison between intermittent generation sources, like wind and solar, and conventional sources, like natural gas-fired plants, levelized costs do provide a rough basis of comparison. The levelized costs of building and operating a new natural gas combined cycle generator is about $65 per MWh.[7]

11. These cost declines have made wind and solar projects increasingly competitive with conventional power plants, contributing to their substantial market growth. Since 2004, total installed wind and solar photovoltaic (PV) capacity has been

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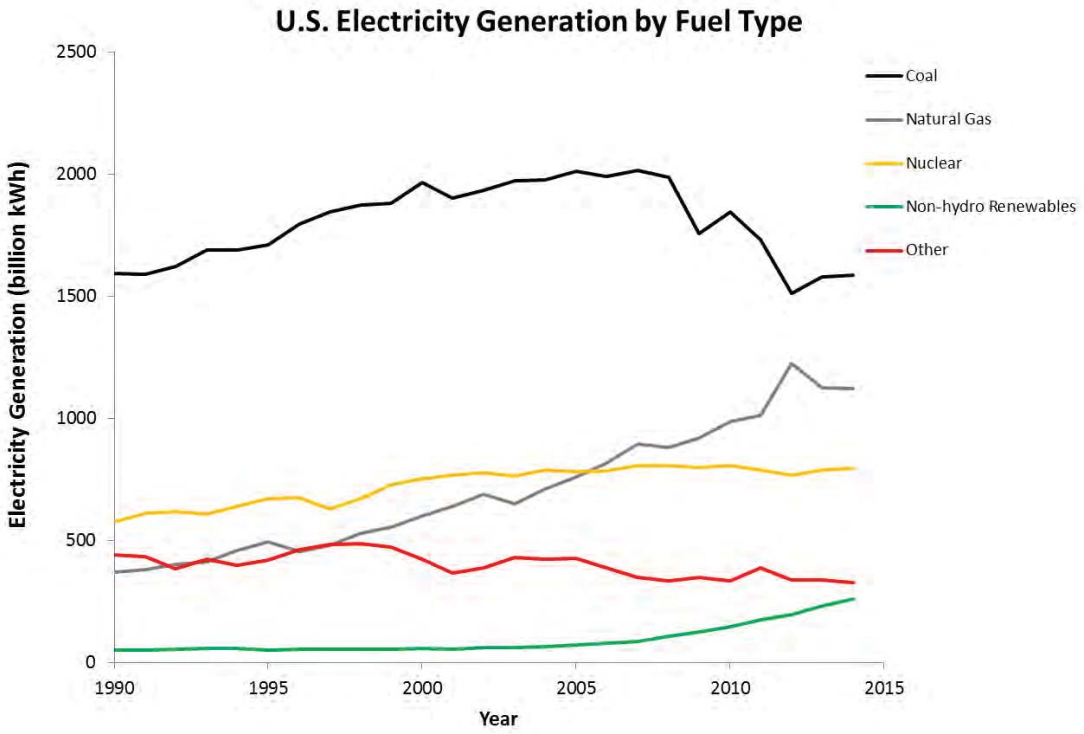
[4] Electric Power Research Institute, "Modeling Technology Learning for Electricity Supply Technologies," September 19, 2013, http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002000871 (accessed June 24, 2015).

[5] Lazard, "Lazard's Levelized Cost of Energy Analysis – Version 9.0," November 2015, https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf (accessed November 23, 2015).

[6] Ibid.

[7] Ibid.

growing at the remarkable rates of 25.6 percent and 60.5 percent, respectively. For the first time, in 2014 renewable projects accounted for more than half of new installed capacity in the U.S.[8] In contrast, that year there was no new coal-fired capacity installed. As the figure shows, coal generation has been falling steadily for nearly a decade.



Source: Energy Information Administration

12. A third factor affecting the power sector is the flattening of electricity demand even as the economy as a whole continues to grow. The National Mining Association's declarant Seth Schwartz contests this change, claiming that EPA's

[8] National Renewable Energy Laboratory, "2014 Renewable Energy Data Book," October 2015, *available at:* http://www.nrel.gov/docs/fy16osti/64720.pdf.

projection of electricity demand is too low. Schwartz ¶ 4. We disagree. Since 2007, electricity demand has remained relatively flat even as GDP recovered from the 2008 recession and has continued to rise. In a recent paper, researchers Hirsch and Koomey suggest this persistent lack of electricity demand growth likely represents a fundamental decoupling of electricity consumption from economic growth.[9] As they observe, the lack of increase in electricity demand can be attributed to, among other factors, increased investments in energy efficiency and improvements in information and communication technology. EPA's demand projection reasonably reflects this reduction in the rate of electricity demand growth.

13. Because the electric power sector accounts for nearly all U.S. coal consumption, the lower generation from coal-fueled power plants has reduced coal demand. In addition, increased mechanization, declining exports, rising production costs, and other factors have contributed to a steady decline in the number of U.S. coal mines and coal mining employment. The number of operating mines in the U.S. declined by 39 percent between the end of 2005 and June 2015.[10]

14. These trends demonstrate that the stay movants are incorrect in asserting that the Clean Power Plan will cause a "fundamental restructuring of the U.S. power sector." Schwartz ¶ 4. In fact, the transition to a lower-emitting power sector is

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[9] Hirsch, Robert F. and Koomey, Jonathan G. "Electricity Consumption and Economic Growth: A New Relationship with Significant Consequences?," *Electricity Journal (2015).*

[10] Bloomberg Intelligence via Parker, Mario, "U.S. Has Fewest Coal Mines Since the Lightbulb was Patented," *Bloomberg Business,* September 23, 2015, http://www.bloomberg.com/news/articles/2015-09-03/u-s-has-the-fewest-coal-mines-since-the-lightbulb-was-patented.

already underway. EPA's interim and final emission performance standards and goals are consistent with the sector's current trajectory of declining carbon emissions per unit of electricity generation. As EPA correctly determined in its rulemaking, there is ample capacity within the power sector to continue on this trajectory. Numerous studies, conducted by us and others, have found that the power sector can continue to reduce its emissions significantly; in fact, the power sector can achieve greater emissions reductions than those required by the Clean Power Plan at modest costs.[11]

15. In sum, the Clean Power Plan will not require any fundamental transformation in the power sector. Further, given the extended compliance schedule in EPA's rule, the existing market trends, and the demonstrated ability of the power sector to quickly and cost-effectively achieve emission reductions, there is no need for drastic or immediate action to meet these standards.

B. Stay Movants Misconstrue EPA's Modeling Results to Claim Specific Harms.

16. Stay movants, relying on the National Mining Association declarant Seth Schwartz and his associated report, allege that EPA's modeling results from the Integrated Planning Model (IPM) demonstrate that the Clean Power Plan requires "affected generators to act immediately" to retire specific existing plants and build

[11] See, e.g., Dallas Burtraw, Matt Woerman and Alan Krupnick, 2015. "Flexibility and Stringency in Greenhouse Gas Regulations," *Environment and Resource Economics,* online: DOI 10.1007/s10640-015-9951-8. Dallas Burtraw, Josh Linn, Karen Palmer and Anthony Paul, 2014. "The Costs and Consequences of Greenhouse Gas Regulation under the Clean Air Act," *American Economic Review: Papers & Proceedings,* 104(5): 557-562.

replacements. Schwartz ¶ 5.[12] Schwartz asserts that EPA's IPM results identify particular units that *will retire* immediately in 2016 or 2018 because of the Clean Power Plan. Schwartz ¶¶ 30, 33. Schwartz incorrectly concludes that "retirement of these units is necessary for states to comply with the CPP." Schwartz ¶ 35. These assertions are wrong and reflect a misunderstanding of the Clean Power Plan standards and a misuse of these modeling results. The Clean Power Plan does not mandate any specific plant closures or any aggregate levels of plant closures, and these modeling results certainly do not support a claim that such early retirements are needed to enable compliance. The following paragraphs explain why.

1. Summary of the Integrated Planning Model.

17. IPM is the best tool available for analyzing the impacts of emissions standards on the power sector, and EPA, power companies, and other organizations have used the model for this purpose for over twenty years. The model is extensively supported and reviewed and underlying data used by EPA is made available in the public domain. EPA has routinely used IPM or its precursors in the development of major power sector rules promulgated since the passage of the Acid Rain Program in the 1990 Clean Air Act.[13] To support development of the Clean Power Plan, EPA used IPM to assess the rule's overall costs, emission reductions and economic impacts.

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[12] Heidell/Repsher Declaration and attached PA Consulting Report similarly misuses EPA's IPM outputs.

[13] See U.S. EPA, Past Power Sector Modeling Applications, http://www2.epa.gov/airmarkets/past-power-sector-modeling-applications.

18. In order to run the model, EPA uses data from utilities, industry and market experts, financial institutions, and government agencies to inform the model inputs and assumptions.[14] The model identifies the least-cost means of meeting electricity demand given specified constraints, such as air pollution standards, and transmission, dispatch, and reliability requirements. For the Clean Power Plan, EPA used the model to estimate the effect of the rule on the electricity market by comparing illustrative compliance scenarios with a "business as usual" reference case. A characteristic of the model is that it operates under the assumption that utility planners have "perfect foresight" today about the specific future market conditions (e.g., determinants of electricity demand, fuel prices, wholesale power prices, technology costs, etc.) that will prevail between now and 2050. This is a useful and appropriate modeling assumption that results in decisions that are consistent over time–that is, the model does not predict an investment or retirement decision in one time period that turns out to be inappropriate in a subsequent time period. Instead, the model makes operational and investment decisions that are consistent with EPA's best understanding of expected future demand, technology and fuel cost parameters.

19. The stay movants derive erroneous conclusions from EPA's IPM results in three ways. First, IPM outputs are illustrative snapshots of *possible* future outcomes, and do not establish regulatory requirements. Second, IPM results are more appropriately used to determine system-level, regional, or state-level impacts, and are not designed to be used as predictions of the investment or retirement decisions at

[14] Documentation for EPA's analysis of the Clean Power Plan using IPM is available at http://www2.epa.gov/airmarkets/analysis-clean-power-plan.

individual plants. Third, the model tends to over-predict early investments and retirements due to its least-cost optimization function and "perfect foresight," which does not take into account various underlying sources of uncertainty that will affect the finances of an individual plant and generally tend to delay investment and retirement decisions.

2. The IPM model output does not impose any regulatory requirements.

20. Importantly, IPM results are illustrative projections of possible compliance actions, assuming specific policy approaches chosen by states–they are not prescriptive and do not impose any regulatory requirements. The Clean Power Plan provides a lead-time period of seven years before the first compliance obligations are imposed in 2022. Beginning in 2022, the Clean Power Plan's obligations are introduced and subsequently phased in through 2030. At no time—either prior to, during, or after the phase-in period—does the Plan impose specific operational or investment changes on plants. Rather, the Clean Power Plan embraces flexible compliance options that, if adopted in state plans, allow individual plants to comply through options such as emissions rate averaging or trading of emissions allowances, and allow increases or decreases in plant utilization, investment, repowering or retirement. The environmental economics literature has firmly established that this is good policy design because it allows the power sector to take advantage of the lowest cost reduction opportunities and to coordinate the timing of operational and investment decisions over time, providing substantial cost savings compared to a

mandated prescriptive approach.[15] Moreover, the timing of these responses can be coordinated not only at the facility level or firm level but at the system level. Therefore, the claim that the Clean Power Plan "requires" coal plant retirements is incorrect.

3. The IPM model results are not appropriately used to predict plant-level decisions.

21. Further, while IPM accounts for information about power plants at the unit level, the model combines select individual units into "model plants" that represent one or several constituent plants that are actual physical plants in the real world. A model plant combines constituent plants that share very similar technology characteristics within a limited geographic area. The model plants preserve information about the costs and availability of coal transportation, gas pipelines, transmission constraints, etc., and how that varies across actual plants. The model plant approach is used primarily to improve efficiency and manage computational size. See also EPA Ex. 2, Declaration of Reid Harvey ¶ 19. IPM results are more appropriately used to determine system-level, regional, or state-level impacts, and are not typically used to describe the investment or retirement decisions at individual plants. Harvey Decl. ¶ 10.

[15] E.g., "Retail Electricity Price Savings from Compliance Flexibility in GHG Standards for Stationary Sources," 2012 (Dallas Burtraw, Matt Woerman and Anthony Paul), *Energy Policy,* 42:67-77.

4. The IPM modeling overestimates near-term actions because it cannot replicate utility planners' response to uncertainty.

22. As we explain in the next several paragraphs, the IPM model results likely overstate near-term coal plant retirements because the model is not able to include the benefit to plant owners of keeping their options open in the face of uncertainty. Called "option value" by economists, this theory of how uncertainty affects actual decision making is well established in the economic literature.[16] The following discussion focuses on coal plant retirements rather than investments, but because the option value theory applies similarly to investments as to retirements, the same arguments apply and indicate that the IPM model likely overstates both near-term coal plant retirements and investment in alternatives. IPM's overestimation of near-term action is likely to be particularly acute in the case of the Clean Power Plan because of the unusually long seven-year lead up to compliance in 2022, the phased-in compliance period between 2022 and 2030, and the significant state policy decisions that have not yet been made.

23. As described above, in order to run the IPM model EPA must assume to be certain a number of conditions that in fact are uncertain. For example, EPA must tell the model what types of state compliance plans will be adopted, the emissions trajectory that will be achieved across states or groups of states that join in multi-state coordination, and how those states will allocate (or auction) allowances or credits. EPA must also input assumptions regarding economic growth, population growth, electricity demand (before the application of any efficiency policies), and many other

[16] See, e.g., Dixit and Pindyck 1994.

market factors. The IPM model also makes assumptions about future technology and fuel costs which, as we note above, have been rapidly changing in recent years. In addition to these input assumptions, the model analyzes the optimal compliance for the whole multi-year period at the same time, meaning that it treats all operational and investment decisions as though they were known with perfect foresight from the very first year considered in the model. Based on these assumptions, the IPM model calculates an optimal, least-cost pathway over the entire 2016-2050 forecast horizon in order to meet the given carbon dioxide limits.

24. In the IPM model, a plant with perfect foresight will retire—even before the 2022 compliance deadline—if doing so reduces eventual system-wide cumulative compliance costs even slightly. But in the real world individual plant owners face numerous sources of uncertainty around the factors mentioned above and owners will seek to postpone decisions until they learn more information. For example, a specific power plant might face increasing operating costs and general life extension costs (such as the need to fix an old turbine) that are only cost-effective if the plant will continue to operate at a high utilization rate over a sufficient period. The IPM model may determine that, based on the particular form of state plan that is assumed, future Clean Power Plan compliance costs would cause retirement to be the least-cost option. But in the real world, the plant's future utilization rate is highly uncertain; it could be higher under some state compliance plans than others. If plant owners believe that the plant might be profitable under some scenarios, the owner will seek to avoid retiring the plant, perhaps by substituting an inexpensive short-term fix for the larger maintenance needs. The small maintenance expense, in this context, gives the

owner the option of keeping the plant in service and delaying the retirement decision. Thus, in an uncertain information environment, plant owners will defer retiring until they know what the state compliance plan will require. Of course, plant owners make these decisions based on a comparison of the private costs and benefits of generating electricity, and do not account for the social costs of the pollution those plants emit, causing plant owners to extend lives more than is socially optimal.

5. A stay would not redress the challenging near-term investment decisions that may face some plants.

25. It may be the case that some coal plants require significant investments for reasons unrelated to the Clean Power Plan that cannot be deferred past the point at which a decision on the merits in this case is expected. Contrary to movants' claims, a stay of the Clean Power Plan would not resolve the near-term investment decisions facing any plants that may be in such a position. This is because the relevance of the Clean Power Plan on such an investment decision is whether that plant will be profitable in 2022 and thereafter if the Clean Power Plan is in effect. But a stay resolves only whether the Rule is in effect during the pendency of the litigation, not whether it will be upheld on the merits and will go into effect in 2022. Moreover, those contemplating investments in carbon-intensive generation would need to consider the possibility of carbon regulations even absent the Clean Power Plan. Companies throughout the economy, including electricity generators, recognize that the problem of climate change is real and a fundamental threat to our welfare and that carbon pollution standards are therefore inevitable. Many power sector companies,

including some of the petitioners, routinely factor the potential adoption of such standards into their investment decisions.[17]

26. The preceding discussion has emphasized regulatory uncertainty, but other forms of uncertainty will also delay retirements, such as uncertainty over technology costs, fuel costs and electricity demand. For example, the Schwartz declaration refers to the uncertainty about the costs of specific compliance options such as energy efficiency. It is possible that these costs will turn out to be higher than EPA projects, as Schwartz supposes, but it is also possible that the costs will turn out to be lower. In fact, as EPA itself acknowledges, the cost estimates EPA used for energy efficiency are conservative (erring on the side of overstating costs).[18] That is, EPA implies it is more likely that the costs will be lower rather than higher than EPA assumes. If the costs are lower than expected, states and utilities may implement more energy efficiency than EPA projects, reducing the need for re-dispatch from coal to gas

[17] As of 2013, prior to the Clean Power Plan, eight U.S. utilities disclosed use of an internal carbon price: Ameren, AEP, CMS, Duke, Entergy, Integrys, PG&E, and Xcel. CDP, Use of internal carbon price by companies as incentive and strategic planning tool (Dec. 2013), https://www.cdp.net/CDPResults/companies-carbon-pricing-2013.pdf. This year, 19 U.S. utilities reported use of an internal carbon price. CDP, Putting a price on risk: Carbon pricing in the corporate world (Sept. 2015), https://www.cdp.net/CDPResults/carbon-pricing-in-the-corporate-world.pdf. Southern Company, one of the petitioners, recently started doing so as well. See *2015 Carbon Disclosure Report,* available at http://www.southerncompany.com/what-doing/pdf/Carbon_Disclosure_Report_2015.pdf.

[18] Environmental Protection Agency, "Demand-Side Energy Efficiency Technical Support Document" at 69, August 2015, http://www2.epa.gov/sites/production/files/2015-11/documents/tsd-cpp-demand-side-ee.pdf.

generation. Thus, some coal plant owners may decide to defer retirement in order to better assess the real compliance costs, retaining the potential for future profitability.

27. For the reasons we have discussed, Schwartz's use of IPM results to identify impacts on specific plants up to seven years in advance of initial and flexible compliance obligations is incorrect.

C. National Mining Association declarants' claim that EPA "manipulated"[19] its base case is unfounded.

28. EPA's modeling includes a base or "reference" case, which illustrates a "business as usual" scenario without the Clean Power Plan for the purpose of comparison to the policy cases. Schwartz alleges that the IPM reference case overstates expected coal plant retirements, based on the fact that the IPM reference case predicts more plant retirements than does the U.S. Energy Information Administration's (EIA's) Annual Energy Outlook 2015. Schwartz ¶ 32. Schwartz then mixes and matches output from the two models—coal capacity in the EIA reference (business as usual) case and the EPA policy case—to claim that the Clean Power Plan will be responsible for even more retirements in 2016 than projected in IPM. Id. These allegations are unfounded.

29. Because of their differing structures, differences in results are to be expected between IPM and EIA's National Energy Modeling System.[20] To name just a few of

[19] E.g., Coal Industry motion at 16.

[20] See Energy Information Administration, "Assumptions to AEO 2015," *available at:* http://www.eia.gov/forecasts/aeo/assumptions/; and Environmental Protection Agency, "Documentation for EPA Base Case v. 5.13 Using the Integrated Planning

the underlying differences, EIA's energy model and the IPM model each represent different coal supply regions, coal types and mine types by creating different supply regions but the EIA energy model creates 41 regions and the IPM model divides the coal market into 67 regions. Likewise, the EIA energy model divides the country into 16 coal demand regions, whereas in IPM each individual coal plant is treated as its own demand region, with a unique representation of the plant's proximity to mines, coal transportation availability, etc. Analogous differences exist between the models' treatment of natural gas supply and demand. These differences have direct and significant implications for the economic decision-making logic of the model, including the decision of whether to retire units on an economic basis. EPA has a solid basis for using the IPM model and the fact that the reference case differs from the EIA energy model is not unexpected and certainly does not show either that EPA's use of it was arbitrary or that EPA in any way manipulated the model.

30. Schwartz's effort to interchange the outputs and projections from the two models by replacing EPA's Reference Case with EIA's Reference Case to examine policy impacts is not a sound or acceptable analytical practice. Because the models rely on significantly different representations of fuel supply, electricity demand, and cost assumptions, the reference case from one model cannot be accurately compared with the policy case from another. This is because just as the EIA's energy model produces its own reference case retirements it would also produce its own level of retirements

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Model" and "Base Case v.5.15 Using IPM: Incremental Documentation," *available at:* http://www2.epa.gov/airmarkets/power-sector-modeling.

in the policy case.[21] The only consistent way to evaluate a policy scenario is to compare the policy case against a reference case within the same model.

31. We also note that Schwartz's reliance on EPA's modeling is internally inconsistent. Schwartz asserts that this Court should view the IPM projection of retirements under the rule as accurate, while arguing that the projections of retirements by the same model under the reference case are inaccurate. Schwartz fails to explain why the same model would be accurate in one instance and inaccurate in another. In fact, as explained above, the model's ability to accurately predict near-term decisions to retire specific plants is limited in both the reference case and in the policy case. Because the Clean Power Plan unfolds over a time frame that involves seven years until initial compliance and an extended phase in period thereafter, the IPM projected retirements in the next 1-3 years are simply inadequate to demonstrate that specific retirements are likely to occur in that timeframe due to the adoption of the rule.

32. More generally, we believe that the aggregate market share projection for coal power in the IPM Base Case (used to perform EPA's reference case modeling (Base Case 5.15)) is well supported. The most significant of the updates made in the IPM Base Case was the inclusion of more accurate (and improved) cost and performance assumptions for renewable energy technologies. Incorporating lower cost and improved performance data for renewable energy in the latest Base Case has

[21] This is evident from comparing EPA's and EIA's analysis of the proposal. EPA's Base Case 5.13 projected coal capacity in 2030 to be 12 GW lower than EIA AEO 2015, and EPA's analysis of the proposed rule similarly projected coal capacity to be 11 GW lower than EIA's analysis of the proposed rule.

the effect of shifting more generation from coal to renewable energy sources. EPA previously relied on the Energy Information Agency (EIA) for its renewable energy assumptions, but EIA's assumptions and forecasts for renewable energy growth have repeatedly been demonstrated to be out of date and overly conservative.[22] For example, in the prior Base Case (Case 5.13), EPA, relying on the EIA's cost assumptions, projected that the United States would install only 5 GW of utility-scale solar PV capacity between 2014 and 2030.[23] In fact, the industry installed that amount of capacity by the second quarter of 2015, 15 years ahead of the prediction, and more than 16 GW of additional capacity has already been contracted to be built in the next two to three years.[24] Although it is particularly difficult to forecast the future growth and costs of rapidly improving technologies,[25] such as onshore wind and solar photovoltaics, EPA appropriately updated its assumptions for these technologies based on well-supported cost data from the National Renewable Energy Laboratory.

33. In addition, more recent information from EIA is consistent with IPM's forecasts. EIA's Short Term Energy Outlook (released November 10, 2015) is a market forecast rather than a modeling projection and it predicts near-term coal

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[22] Advanced Energy Economy Institute, "Competitiveness of Renewable Energy and Energy Efficiency in U.S. Markets," June 2015, *available at:* http://info.aee.net/competitiveness-of-renewable-energy-and-energy-efficiency-in-us

[23] *See* "Renewables: Other" capacity builds in "IPM System Summary Report, Base Case."

[24] Solar Energy Industries Association and Greentech Media Research, "Q2 2015 Solar Market Insight Report," September 8, 2015, http://www.seia.org/research-resources/solar-market-insight-report-2015-q2.

[25] U.S. Department of Energy, "Revolution Now: The Future Arrives for Four Clean Energy Technologies," September 17, 2013, *available at*: http://energy.gov/sites/prod/files/2013/09/f2/200130917-revolution-now.pdf.

consumption closer to that in EPA's reference case than to the earlier EIA Reference Case cited by Schwartz. EIA's Short Term Energy Outlook estimates that power sector coal consumption for 2015 will amount to 773 million tons and is projected to remain flat in 2016.[26] EPA's Base Case 5.15 aligns with EIA's market forecast, projecting power sector coal consumption of 771 million tons annually in its 2016 model period.

34. Schwartz also claims that the retirements that occurred in advance of the mercury and air toxics standards confirm that the IPM model underestimates retirements. Schwartz ¶ 44. There are several reasons why this is not the case. First, the significant market changes described in Section A, supra, occurred after the IPM modeling for the mercury standards was carried out. Natural gas prices turned out to be significantly lower than had been predicted at the time the mercury standards were modeled. In our previously published work we have illustrated the dominance of lower natural gas prices in shaping the changes that have emerged in the power sector.[27] It was the lower natural gas prices – not any flaw inherent to the IPM model – that drove the additional retirements.

35. Second, the mercury standards required each coal plant to install significant pollution control equipment (or to switch to natural gas). In contrast, the Clean Power Plan allows for use of flexible compliance strategies that avoid the need to install

[26] Energy Information Administration, "Short Term Energy Outlook," November 10, 2015, *available at:* http://www.eia.gov/forecasts/steo/report/

[27] "Secular Trends, Environmental Regulations and Electricity Markets," 2012 (Dallas Burtraw, Karen Palmer, Anthony Paul and Matt Woerman), *The Electricity Journal,* 25 (6): 35-47.

capital-intensive pollution controls. This flexibility reduces the incentive to retire. Finally, the Clean Power Plan provides a longer lead-time than the mercury standards, making it even less likely that there will be significant near-term retirements.

D. Additional IPM modeling Confirms That Deferring Action Until State Compliance Frameworks are Finalized Does Not Result in Unreasonable Costs.

36. The option value, which was discussed above, suggests that if delaying decisions would make compliance much more difficult or much more costly, owners and operators of power plants might not delay making compliance decisions. In fact, under the adopted rule, the owners and operators of affected plants have ample time to make and implement decisions of whether to retain or retire them. Likewise, they have time to make and implement decisions regarding replacement capacity. See Tierney ¶ 48. In neither case would there be a high cost to delaying decisions for the length of time needed to await this Court's decision on the merits, or even to learn the outcome of state plans in 2018.

37. The low cost of deferring these investment decisions can be seen in additional IPM runs performed by ICF International and commissioned by M.J. Bradley & Associates, and based on assumptions developed by M.J. Bradley & Associates in consultation with various electric sector experts.[28] These modeling runs analyze the cost impacts of deferring compliance actions including investing in energy efficiency programs and building new power plants. These modeling runs were

[28] This analysis was supported, in part, by the Natural Resources Defense Council.

constructed to illustrate compliance costs if plant owners and operators were to defer commitments to new projects until the end of 2018, with such projects being completed and coming online during the interim compliance period (2025 model year). Specifically, in the "deferred build" compliance scenarios the model is restricted from commencing any new gas or renewable energy generation projects (or initiating any energy efficiency projects) above business-as-usual levels until 2018 and from bringing any such resources (including energy efficiency savings) online until the 2025 model year.[29]

38. The results of these runs show that overall compliance costs of the deferred action scenarios remain comparable to "normal response" cases under both a mass-based and rate-based program. (see Appendix). The primary impact of the deferred action scenarios was to shift costs later in the compliance period, without significantly affecting cumulative compliance costs. Deferred action results in a 0.7 to 1.4 percent increase in the cumulative net present value of modeled system costs above the normal response cases,[30] and the cost impacts remain reasonable in all years and in all cases. Appendix Tables A1 and A9.

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[29] IPM includes a lead time for project permitting and construction of 2-4 years depending on plant type. If decisions are deferred until the end of 2018, projects would be completed between 2021 and 2023 – to be conservative, this analysis assumes all generating capacity and energy efficiency programs are brought online in the 2025 model period (which maps to 2023-2027).

[30] The range represents the impacts found under the mass-based and rate-based analyses. This is a comparison of total modeled costs, i.e. representing costs to plant owners and operators. The cost impacts for energy efficiency participants are excluded from this calculation – for a more detailed discussion of how efficiency is treated in the MJBA analysis, see the Appendix.

39. The overall impacts of deferred action on the generation mix in the final (2030) compliance period are also small. Due primarily to delayed investments in energy efficiency, the power sector relies more heavily on new natural gas builds in 2025 and 2030, which in turn results in a small incremental decline (1.4 to 3.4 percent) in coal generation in 2030. This small projected additional decline in coal generation in 2030 is, of course, not imminent, nor certain to occur.

40. The small amount of potential system-wide cost savings from plant owners acting as early as 2016, as opposed to waiting until 2018 or later, undermines the applicants' reliance on EPA's IPM runs as evidence of irreparable harm absent a stay. As discussed above, option value principles indicate that unless the cost savings from early action are large, in the face of uncertainty, delaying compliance decisions is often preferred. Such a course will keep the options for existing plants open until uncertainties such as the compliance framework are resolved or reduced.

E. Movants Ignore Flexible Compliance Opportunities.

41. Stay movants argue that certain plants will be unable to comply with EPA's emission performance standards and will therefore be forced to retire in 2022. For the reasons described above, none of these retirements are ever mandated and compliance with the emissions standards does not need to occur until at least 2022, far longer than the time necessary for this Court to resolve these legal challenges. But stay movants also fail to acknowledge the availability of flexible compliance options, further undercutting their claim that plant owners will make early plant retirement

decisions. As discussed, states have wide discretion in how to design state plans and some states may elect to design plans to avoid retiring some units.

42. Individual coal plants can also meet the standards either partially or totally through actions taken at the plant.[31] As EPA identified, coal plants can reduce their emissions by improving the efficiency (also known as the "heat rate") of their plant. Making such improvements will reduce, but not eliminate, the need to take advantage of flexible compliance methods. Likewise, greater emission reductions can be achieved by shifting generation from less efficient to more efficient coal plants.[32] Finally, coal plants can further reduce their emissions and potentially meet the target emission rate on their own by co-firing with lower emitting fuels such as waste biomass or natural gas or by adopting carbon capture and sequestration. 80 Fed. Reg. at 64,727.

F. Additional Economic Studies Cited by Movants Are Flawed.

43. The stay movants also point to additional studies purporting to show that the Clean Power Plan will result in various harmful economic impacts. These studies, two of which were based on the proposed rule, rely on deeply flawed assumptions,

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[31] Joshua Linn, Erin Mastrangelo and Dallas Burtraw, 2014, "Regulating Greenhouse Gases from Coal Power Plants under the Clean Air Act," *Journal of the Association of Environmental and Resource Economists,* 1(1):97-134.

[32] *See* Dallas Burtraw, Matt Woerman and Anthony Paul, 2012. "Retail Electricity Price Savings from Compliance Flexibility in GHG Standards for Stationary Sources," *Energy Policy,* 42:67-77.

including assumptions about implementation of the Clean Power Plan that differ significantly from the final rule and do not reflect the best information.

44. For example, movants cite an October 2014 study of the *proposed* standards by NERA Economic Consulting. UARG Ex. C at 33; Northwestern Corp. Ex. B at 7. Among other features, the NERA report assumes energy efficiency investment costs that are 63% higher than those EPA used in its proposal and approximately 150% higher than those found by the Department of Energy's Lawrence Berkeley National Lab. Conversely, NERA underestimates the benefits of the Clean Power Plan by ignoring the economic benefits of reducing pollution. The NERA study is contradicted by EPA's cost-benefit analysis of the final Clean Power Plan, which finds that, through use of flexible compliance options and investments in energy efficiency, the final Clean Power Plan is expected to dramatically reduce compliance costs and benefit consumers. Regulatory Impact Analysis at 3-40. Moreover, the environmental benefits of the rule, including reductions in carbon dioxide and other air pollutants, have important economic consequences that EPA and our own independent work finds to be substantially greater than the costs of the regulation.[33] Regulatory Impact Analysis at ES-20.

45. Peabody Coal Company provides a declaration of Harry Alford, which relies on a June 2015 study of the *proposed* rule. Peabody Ex. B at ¶¶ 6-7. This study claims that the Clean Power Plan will have severe economic impacts on low-income and

[33] Dallas Burtraw, Joshua Linn, Karen Palmer and Anthony Paul, 2014, "The Costs and Consequences of Greenhouse Gas Regulation under the Clean Air Act," *American Economic Review: Papers & Proceedings,* 104(5): 557-562.

minority groups. To reach this erroneous conclusion, the study uses an unexplained methodology that synthesizes seven other studies—including the flawed NERA study, and even studies conducted prior to the proposal—many of which assume highly overstated costs. The claims made in this study, such as a claim that the Clean Power Plan would result in 7 million cumulative job losses for African Americans and 12 million job losses for Latinos, are not credible.

46. Finally, NorthWestern Energy contracted with the Bureau of Business and Economic Research of the University of Montana to develop a study purporting to show the economic costs of the Clean Power Plan in Montana. NorthWestern Energy Ex. B. This study is flawed in several ways. First, the study is not relevant to the question of a stay of the Clean Power Plan because the claimed impacts would not occur during the litigation period. Second, the study is based on an extreme scenario for Clean Power Plan compliance in Montana. It is premised on retirement of all four units of Montana's largest coal plant (Colstrip) in 2022 and replacement of that generation with new natural gas combined cycle plants. But numerous other compliance pathways are available that would not require full closure of all units at the plant and would take advantage of other flexible compliance tools, including renewable generation and energy efficiency and trading, rather than only new natural gas generation plants. The economic analysis developed based on this unrealistically costly compliance path does not provide a reasonable estimate of likely costs (and fails entirely to consider benefits). Finally, the study is also unreliable because it relies on electricity price information from the flawed 2014 NERA report.

Conclusion

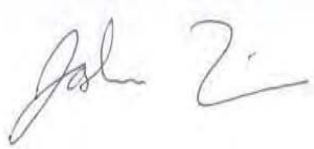
47. In summary, a shift toward lower-carbon generation is already occurring in the power sector. Stay movants and declarants ignore these ongoing trends to claim that the Clean Power Plan will require an immediate overhaul of the electricity system and cause widespread premature plant closures. In reality, the requirements of the Clean Power Plan are aligned with the changes already underway in the power sector. Compliance requirements do not begin until 2022, and are phased in gradually over eight years. Due to the flexible compliance options available under the rule, plant closures and investments in alternatives are economic decisions, not requirements of the rule. Those decisions can be delayed until this Court has completed its consideration with little or no impact on compliance costs. Stay movants will not experience irrevocable near-term harms as a result of the Clean Power Plan.

We declare under penalty of perjury that the foregoing is true and correct to the best of our knowledge and belief.

Executed on December 7, 2015.



Dallas Burtraw



Joshua Linn

Appendix 1: Assumptions used in MJ Bradley & Associates Analysis

The M.J. Bradley & Associates analysis was based on IPM runs conducted by ICF international. M.J. Bradley & Associates relied on EPA's assumptions for EPA Base Case version 5.15[34] as the starting point for the analysis. Additional assumptions described here were developed by M.J. Bradley & Associates in consultation with various electric sector experts. Some additional firm retirements (17 units; 5.6 GW) were added to the NEEDS database, based on recent public announcements. Energy efficiency costs estimates were developed based on a comprehensive report by Lawrence Berkeley National Laboratory which found, based on 2,100 program-years of data, that the national average cost of saved energy between 2009 and 2013 was 4.6 cents/kilowatt-hour.[35]

California and the nine states in the Regional Greenhouse Gas Initiative (RGGI) were assumed to continue their current programs as a means of complying with the Clean Power Plan. In California, AB-32 CO_2 Allowance Prices were based on the California Energy Commission (CEC) IEPR "High Energy Consumption Case" through 2020;[36] prices were held constant at 2020 levels (in real terms) post-2020.

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[34] Environmental Protection Agency, "Documentation for EPA Base Case v. 5.13 Using the Integrated Planning Model" and "Base Case v.5.15 Using IPM: Incremental Documentation", *available at* http://www2.epa.gov/airmarkets/power-sector-modeling

[35] Lawrence Berkeley National Laboratory, "The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs: Estimates at the National, State, Sector and Program Level," April 2015, *available at:* https://emp.lbl.gov/sites/all/files/lbnl-6595e.pdf.

[36] California Energy Commission, "Preliminary 2015 IEPR Production Cost Model Common Case Input Assumptions," March 10, 2015. *Powerpoint available at*: http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-

California's new SB 350 RPS policy was also implemented in the model. The carbon emissions charge on electricity imports to California was removed in 2022 and beyond in the CPP policy cases based on the logic that the country has transitioned to a national CO_2 program. RGGI was assumed to remain at its 2020 goal in the Reference Case and Policy Cases. For all other states, the existing source + new source complements were used for the mass-based analyses, and the state blended rates were used for the rate-based analyses.

03/TN203796_20150309T154002_Preliminary_2015_IEPR_Production_Cost_Model_Assumptions.pptx.

Appendix 2: Detailed Results

Table A1: Net Present Value (NPV) of Cumulative Modeled System Costs[37]

Cumulative Total System Costs, 2016-2050, 3% discount rate (NPV, Million 2012$)	
Scenario	
Reference Case	4,484,370
Mass-based, Normal Response	4,346,713
Mass-based, Deferred Builds	4,376,042
Rate-based, Normal Response	4,291,800
Rate-based, Deferred Builds	4,351,956

Table A2: Coal Generation

Coal Generation (TWh)			
Scenario	2020	2025	2030
Reference Case	1,430	1,399	1,414
Mass-based, Normal Response	1,319	1,158	1,055
Mass-based, Deferred Builds	1,349	1,166	1,019
Rate-based, Normal Response	1,348	1,173	1,008
Rate-based, Deferred Builds	1,364	1,152	994

[37] The MJBA assessment accounts for two components of energy efficiency investments: program costs (50%) and participant costs (50%). Energy efficiency program costs represent the cost to utility companies of developing energy efficiency programs. In the MJBA analysis, energy efficiency is included in the model's cost optimization process. IPM optimizes its investments in energy efficiency based on program costs, which is representative of utility decision-making. Energy efficiency participant costs are excluded from the cumulative costs in this table in order to show the incremental impacts on modeled costs of the deferred build constraints.

Table A3: Coal Capacity

Coal Capacity (GW)			
Scenario	2020	2025	2030
Reference Case	203	202	201
Mass-based, Normal Response	185	174	165
Mass-based, Deferred Builds	191	174	162
Rate-based, Normal Response	189	183	181
Rate-based, Deferred Builds	192	185	181

Table A4: Natural Gas Combined Cycle (NGCC) Generation

NGCC Generation (TWh)			
Scenario	2020	2025	2030
Reference Case	1,120	1,229	1,335
Mass-based, Normal Response	1,164	1,243	1,319
Mass-based, Deferred Builds	1,178	1,387	1,470
Rate-based, Normal Response	1,148	1,243	1,314
Rate-based, Deferred Builds	1,184	1,353	1,393

Table A5: Natural Gas Combined Cycle (NGCC) Capacity

NGCC Capacity (GW)			
Scenario	2020	2025	2030
Reference Case	247	262	291
Mass-based, Normal Response	251	265	291
Mass-based, Deferred Builds	246	279	306
Rate-based, Normal Response	247	254	267
Rate-based, Deferred Builds	245	258	271

Table A6: Non-hydro Renewables Generation

Non-hydro Renewables Generation (TWh)			
Scenario	2020	2025	2030
Reference Case	385	424	451
Mass-based, Normal Response	395	433	462
Mass-based, Deferred Builds	370	426	474
Rate-based, Normal Response	395	438	532
Rate-based, Deferred Builds	370	508	602

Table A7: Non-hydro Renewables Capacity

Non-hydro Renewables Capacity (GW)			
Scenario	2020	2025	2030
Reference Case	137	149	159
Mass-based, Normal Response	139	151	163
Mass-based, Deferred Builds	133	148	169
Rate-based, Normal Response	138	152	198
Rate-based, Deferred Builds	132	189	237

Table A8: Energy Efficiency Savings

Energy Efficiency Savings (TWh)			
Scenario	2020	2025	2030
Reference Case	0	0	0
Mass-based, Normal Response	25	205	346
Mass-based, Deferred Builds	0	25	206
Rate-based, Normal Response	25	204	347
Rate-based, Deferred Builds	0	25	206

Table A9: Total Annual System Costs, including Energy Efficiency Participant Costs, Relative to the Reference Case

Compliance Costs, Including EE Participant Costs (Million $2012)			
Scenario	2020	2025	2030
Reference Case	0	0	0
Mass-based, Normal Response	583	-138	4,182
Mass-based, Deferred Builds	-3,004	1,150	3,681
Rate-based, Normal Response	-53	-617	3,992
Rate-based, Deferred Builds	-2,344	2,925	5,551

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

DECLARATION OF MADELEINE K. ALBRIGHT

I, Madeleine K. Albright, declare as follows:

1. I served as Secretary of State for the United States from 1997 to 2001. From 1993 to 1997, I was the United States' permanent representative to the United Nations. I am currently chair of Albright Stonebridge Group ("ASG"), a global strategy firm, and the first Michael and Virginia Mortara Endowed Distinguished Professor in the Practice of Diplomacy at Georgetown University's School of Foreign Service.

2. The purpose of this declaration is to alert the Court to the damaging implications of a stay of the Clean Power Plan – one of the Obama administration's key means of achieving real and enforceable carbon pollution reductions.

3. President Obama has articulated on numerous occasions that curbing dangerous climate pollutants is not just a domestic priority but is one of his central foreign policy objectives. In his Climate Action Plan, announced in June 2013, he stated that "it is imperative for the United

States to couple action at home with leadership internationally. America must help forge a truly global solution to this global challenge . . . ."[1] In addressing the United Nations this September, the President said: "The United States will work with every nation that is willing to do its part so that we can come together [at the upcoming international negotiations] in Paris to decisively confront this challenge."[2] And the President said on November 6 that "[i]f we want to prevent the worst effects of climate change before it's too late, the time to act is now. Not later. Not someday. Right here, right now."[3]

4. The President's domestic efforts to secure progress on climate change have allowed the United States to maintain a strong leadership position on the issue of climate change around the world, resulting in the establishment of greenhouse gas pollution reduction goals and action programs by more than 170 countries in advance of the Paris Climate Conference.

5. The domestic climate actions of the United States over the last several years have played an essential, catalytic role in bringing about these international commitments – including commitments by Chinese President

[1] Executive Office of the President, The President's Climate Action Plan 5 (June 2013), available at: https://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf.
[2] The White House Office of the Press Secretary, Remarks by President Obama to the United Nations General Assembly (Sept. 28, 2015), available at: https://www.whitehouse.gov/the-press-office/2015/09/28/remarks-president-obama-united-nations-general-assembly.
[3] The White House Office of the Press Secretary, Statement by the President on the Keystone XL Pipeline (Nov. 6, 2015), available at: https://www.whitehouse.gov/the-press-office/2015/11/06/statement-president-keystone-xl-pipeline.

Xi in Beijing last year. The commitments by China and the U.S. – the world's number 1 and 2 greenhouse gas emitters – have triggered the wave of commitments by other countries summarized above.

6. The Environmental Protection Agency's Clean Power Plan is the centerpiece of the Climate Action Plan and accounts for the largest fraction of the United States' emission reduction commitments. Other important measures in the Climate Action Plan include carbon emission reduction and fuel economy standards for light- and heavy-duty vehicles, and mandatory reductions in methane and hydrofluorocarbon emissions from other sectors.

7. The Clean Power Plan and other actions taken pursuant to the Climate Action Plan form the basis for the United States' Intended Nationally Determined Contribution at the Paris Conference, which commits this country to a 26-28 percent reduction in greenhouse gas emissions in 2025, compared to 2005 levels.[4]

8. After the Paris Conference, each country will be responsible for effectuating the domestic policies necessary to achieve their emissions reduction commitment. Just as they have watched each other's commitments leading up to Paris, countries will watch each other's performance after Paris. The leadership role of the United States will remain critical. If our country follows through on its own domestic commitments, we will strengthen the performance of other countries. On

[4] United States Intended Nationally Determined Contribution, available at: http://www4.unfccc.int/submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf.

the other hand, if our country were to falter or renege on its commitments, we will undermine others' performance.

9. A stay of the Clean Power Plan could derail the international momentum to implement the emission reduction commitments achieved at the Paris Climate Conference. Specifically, a stay of the Clean Power Plan would likely cast doubt on the ability of the United States to achieve domestic emission reductions and lead other nations to delay implementing emission reductions. Such a loss of momentum could quickly snowball, causing more nations to signal their intent to delay. If the loss of momentum were great enough, it could not be repaired even following a decision on the merits upholding the Clean Power Plan.

10. If a stay led to this loss of momentum, the next opportunity to recoup the momentum would be years away, and the world would be irreparably harmed by the delay in curbing climate-changing emissions. In this way, a stay would seriously impede the administration's ability to achieve the important foreign policy objective of reducing dangerous global climate change.

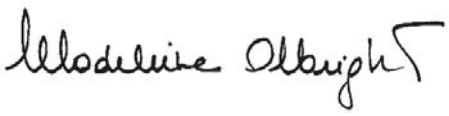
11. To recap, the United States' continued leadership is critical to ensure the successful implementation of the reduction commitments made at the Paris Climate Conference and embodied in domestic policy plans. The United States occupies a unique position as the world's sole superpower, the world's largest economy and the second largest emitter of carbon dioxide. The United States' engagement on climate change over the last six years has been critical to securing the significant commitments made

by the international community. This leadership was possible only because the United States was taking action and committing to robust domestic policies on greenhouse gases. A stay of the Clean Power Plan would seriously undercut United States' leadership in the international arena and irreparably undermine the international commitments and momentum to finally begin curbing the greenhouse gas emissions that are driving extremely dangerous climate change across the globe.

12. In my judgment as a former Secretary of State, because a stay of the Clean Power Plan would have the serious adverse foreign policy consequences described above, granting a stay would be sharply contrary to the public interest.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on December 7, 2015.



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Madeleine K. Albright

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF JON WELLINGHOFF

I, Jon Wellinghoff, declare as follows:

1. I am a Partner at the law firm of Stoel Rives, LLP, located at 3 Embarcadero Center, Suite 1120, San Francisco, CA 94111. From August 2006 until November 2013, I served as Commissioner of the Federal Energy Regulatory Commission ("FERC" or "Commission"). I served as Chairman of the Commission for four and a half years, from January 2009 until November 2013. As Chairman, I oversaw regulatory and enforcement activities to carry out the Commission's core responsibilities under the Federal Power Act. Among other things, I championed policies such as Orders 1000, 745, and

755 that promoted regional transmission planning, fast responding regulation services, and equitable access to the grid by providers of demand response, renewable energy, and other clean energy technologies. These Orders help provide greater diversity, resiliency, and reliability to wholesale electricity markets.

2. Prior to my tenure at the Commission, I served two terms as the State of Nevada's first Advocate for Customers of Public Utilities. I also served as General Counsel for the Nevada Public Utilities Commission from 1998 until 2000. As Customer Advocate, I authored Nevada's first statute requiring utilities to undertake comprehensive integrated resource planning and played a key role in authoring and implementing the Nevada Renewable Portfolio Standards Act. As General Counsel, I oversaw all case filings including integrated resource planning proceedings and financing proceedings for the construction of new electric system infrastructure. My full *curriculum vitae* is attached to this declaration.

3. The purpose of this declaration is to provide information relevant to the pending motions for stay of the Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

Overview

4. Various declarants for stay movants have alleged that the Clean Power Plan poses a near- or long-term threat to the reliability of the electric grid, and intrudes on the traditional authority of federal or state energy regulators. These concerns are unfounded.

5. The electric grid is regulated and maintained by a robust network of authorities and entities that jointly provide multiple checks to ensure reliability through an established system of regulatory tools, planning processes, and market instruments. This long-standing system for protecting and reinforcing reliability has functioned extremely well, including during the current period of rapid change in the power sector.

6. There is no reason to expect this established reliability system to change as sources, states, and EPA move forward with implementation of the Clean Power Plan. The rate of carbon dioxide emission reductions required by the Clean Power Plan is comparable to reductions observed in the power sector over the last decade. In addition, the Clean Power Plan provides states and power companies with considerable flexibility, including flexibility to adopt market-based approaches that promote least-cost emission reduction and protect reliability. These flexibilities blend naturally with the current framework for operating and balancing the grid as well as the planning and

oversight processes that power companies, grid operators, utility commissions, and FERC already conduct. Moreover, the Clean Power Plan features additional tools and safeguards — in response to input provided by FERC, power companies, grid operators, and other entities — to help ensure that the grid continues to operate reliably while the nation continues to reduce its carbon dioxide emissions.

7. Concerns that the Clean Power Plan infringes upon the jurisdiction of FERC or the state Public Utilities Commissions are also misplaced. The Clean Power Plan does not dictate how FERC or the state Public Utilities Commissions should carry out their core functions. To the contrary, it provides great flexibility to states and power companies with respect to how and when they achieve needed reductions in greenhouse gas emissions. The Clean Power Plan is ultimately just one of many factors — including other state and federal environmental requirements, public policies affecting the energy sector, and market forces — that FERC and the state Public Utilities Commissions take into account when carrying out their ratemaking, oversight, and regulatory functions.

Federal and state actors have complementary and reinforcing roles to assure grid reliability.

8. The electric system is designed to deliver a commodity with unique characteristics. Unlike most goods, electric supply and demand must be balanced at all times to ensure availability. Should demand eclipse supply, reliability is threatened, in the form of power disruption (i.e., a blackout).

9. The electric grid is necessarily designed and operated to ensure reliability. Almost any change to an aspect of the grid — be it in planning, design, construction, or operation — is thoroughly reviewed for reliability impacts. In so doing, planners and operators typically use a long-standing definition of reliability, termed the "one day in ten year" loss-of-load expectation standard, which defines reliability as no more than one day of involuntary transmission or generation level service interruption every ten years.

10. Under this standard, no one source of energy is intrinsically more or less "reliable" than any other, nor is any particular amount of any one resource deemed necessary to ensure reliability. Rather, grid planners typically employ probability models to determine the overall amount of supply needed to reliably meet expected demand.

11. The electric grid is overseen by federal, regional, and state entities that work together in complementary and reinforcing roles to preserve reliability. As

discussed further below, this network of actors has helped safeguard reliability in the face of dramatic change currently underway in our nation's power sector, and is well equipped to deal with the continuation of these trends anticipated under the Clean Power Plan.

12. Federal and regional institutions with responsibilities for maintaining reliability include FERC, Independent System Operators and Regional Transmission Organizations, the North American Electric Reliability Corporation, and the eight Regional Entities.

13. FERC implements the Federal Power Act. Under the Act, FERC has authority over "the transmission of electric energy in interstate commerce and . . . the sale of electric energy at wholesale in interstate commerce."[1] Under Sections 205 and 206 of the Act, FERC ensures that the rates charged for wholesale electricity and transmission are "just and reasonable" and not unduly discriminatory.[2] Under Section 215 of the Act, FERC oversees the establishment and enforcement of reliability standards for the bulk power system.[3]

14. In carrying out these mandates, FERC has promulgated a number of relevant Orders. Because electric reliability is intertwined with the planning, design,

[1] 16 U.S.C. § 824(b)(1).
[2] 16 U.S.C. §§ 824d(a), 824e(a).
[3] 16 U.S.C. § 824o.

and operation of the electric grid, these Orders necessarily support grid reliability. For example, Order 888 requires that public utility provide non-discriminatory service, Order 890 requires coordinated, open, and transparent transmission planning, and Order 1000 requires that public utilities participate in regional and interregional transmission planning processes. These Orders not only support a more coordinated and transparent grid, but, given the role planning plays in assessing and ensuring the loss-of-load expectation standard is met, a more reliable one as well.

15. FERC also oversees "Independent System Operators" and "Regional Transmission Organizations" that direct transmission system operations for more than 60% of electric power supply in the United States. In addition to handling day-to-day operations, these entities support reliability by modeling and planning for long-term changes to the electric grid within their respective operating regions to ensure that sufficient supply will exist to meet expected future demand. These entities have a number of tools and practices available to safeguard reliable operation of the grid as well, including: running capacity auctions to ensure that sufficient resources are committed to be available at known future periods; determining if and when future transmission upgrades and installations are needed; and entering into

reliability-must-run contracts with resource owners, which keep a unit operating in the case of sudden and unexpected retirements or plant losses.

16. FERC is also authorized under the Energy Policy Act of 2005 to designate and oversee an Electric Reliability Organization. This Organization, currently the North American Electric Reliability Corporation, in turn oversees eight Regional Entities. The North American Electric Reliability Corporation's specific role in the electric grid — to develop and monitor reliability standards — defines reliability requirements for planning and operating the bulk power system. These reliability standards are also overseen by Regional Entities, with oversight from the North American Electric Reliability Corporation and FERC.

17. At the state level, Public Utility Commissions and utility companies support grid reliability. Public Utility Commissions, which regulate local distribution and retail sales, serve as the state entities that oversee utility companies. They are responsible for a variety of planning and ratemaking processes and, depending on the state, may be involved with forecasting and determining resource adequacy.

18. Utility companies provide electric service to end users and must ensure that sufficient distribution exists to transport electricity. Utility companies must

also purchase (or, in some cases, build) enough generation to fulfill demand in their service territories.

The grid has experienced rapid change in recent years; nonetheless grid regulators have preserved safe, reliable, and affordable electricity.

19. Economic forces and technological innovation are driving transformational changes to our nation's resource mix, yet the same long-standing practices and tools continue to keep the grid reliable. The use of coal-fired electricity generation has declined substantially: between 2003 and 2013, coal's share of generation dropped from nearly 51% to just under 39%. Meanwhile, natural gas-fired and renewable generation resources have accounted for 93% of all new generation since 2000. Since 2005, coal –fired generation has fallen more than 20%, gas generation has increased nearly 50%, and wind and solar generation has increased nearly ten-fold.

20. At the same time, the power sector is also moving from an analog industry to a digital one. At the inception of the electricity sector, power was generated at a particular plant, transported via transmission and distribution, and consumed by end-users. Information necessarily flowed in the inverse direction, collected manually by on-the-ground utility workers like meter-readers. However, digital communications and technological advances in communication are now transforming this sector. Information can now flow

bi-directionally, instantaneously, and digitally, creating opportunity to remove or reduce once-necessary system inefficiencies like flat rates, high demand peaks, and rapid ramping. This change is transformative and should not be understated: it allows for once-requisite energy waste to be put to efficient use. The end result, like any system efficiency, is a tangible, real world benefit for all those involved in the sector. In this case, that result takes the form of lower electricity bills for end users, increased grid reliability and resiliency, and improved environmental outcomes (e.g., reduced carbon dioxide emissions).

The Clean Power Plan does not threaten grid reliability because its effects are modest and remote in time in comparison to changes already under way.

21. The emission limitations established under the Clean Power Plan will not take effect until 2022, providing power companies and their regulators a lead time of almost seven years to prepare for compliance. Because sources face no requirements until 2022 under the Clean Power Plan, there is no reason to believe the Clean Power Plan will pose near-term reliability risks.

22. Once the emissions limitations take effect, the Clean Power Plan increases the stringency of the standards gradually through 2030.[4] As a result of the long lead time and gradual implementation period, the emission targets of the

[4] *See* Final Clean Power Plan, 80 Fed. Reg. at 64,824.

Clean Power Plan are well within the range that the power system has historically demonstrated it is capable of achieving without compromising affordable and reliable electric service.

23. Indeed, the power sector already reduced carbon dioxide emissions by approximately 15% between 2005 and 2013 — achieving nearly half of the 32% reduction below 2005 levels that EPA has projected will occur by 2030 under the Clean Power Plan.[5] Over the same eight-year time period, coal-fired generation declined by nearly 20% — a greater rate of decline than is projected to occur over the next fifteen years under the Clean Power Plan.[6] The fact that reliability has been preserved in the face of these fundamental grid and resource changes illustrates the effectiveness of current frameworks to address reliability.

Flexibilities in the Clean Power Plan further support grid reliability.

24. The Clean Power Plan features a number of compliance flexibilities — discussed in more detail below — that allow power companies and state regulators significant discretion to adjust the timing, manner, and location of emission reductions to meet local circumstances. Briefly stated, these flexibilities include:

[5] *See id.* at 64,689 tbl. 4.
[6] *See id.* at 64,785.

a Flexibility for each state to determine a unique emissions trajectory or "glide path" over the 2022–2029 interim compliance period, provided that it meets the average interim target set forth in the Clean Power Plan.[7]

b Flexibility for states to adopt plans that provide flexible compliance options to covered sources, so that sources can decide the most cost-effective way to come into compliance. For example, under a rate-based emissions crediting and mass-based emissions trading, power plants can choose whether to reduce their own emissions through efficiency improvements, fuel-switching, or reduced operation, or to pursue other measures such as end-use efficiency and demand response, renewable generation, or shifts in dispatch away from inefficient highly polluting assets and towards more efficient, lower-emitting generation.

c Flexibility for states to allow covered sources to pursue the least cost emissions reductions opportunities, even if those occur in other states. This can be done by leveraging renewable projects in other states through mechanisms similar to those already in place today to support

[7] *See* Final Clean Power Plan, 80 Fed. Reg. at 64,953 (to be codified at 40 C.F.R. § 60.5855) (describing emission performance rates).

state policies, or through interstate trading of emissions credits or allowances.

25. Collectively, these flexibilities provide power companies with significant latitude to determine which sources reduce emissions and when, and to adjust compliance strategies as needed to deal with unexpected events. As a result, the flexibility of the Clean Power Plan safeguards reliability as well as promotes cost-minimizing approaches to emission reduction.

The Clean Power Plan provides substantially greater compliance flexibility than prior regulatory programs.

26. These compliance options, and the extended implementation timeframe, provide far more flexibility to power companies and states than recent Clean Air Act regulations. EPA's Mercury and Air Toxics Standards, for example, required approximately 1,400 coal- and oil-fired electric generating units nationwide to meet source-specific emission limits requiring an approximately 75% reduction in mercury emissions and 88% reduction in acid gas emissions across the power sector.[8] Unlike the Clean Power Plan,

[8] *See* National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9,304, 9,424 (Feb. 16, 2012).

the Mercury and Air Toxics Standards does not allow for emissions trading or averaging for toxic air pollutants such as mercury.[9]

27. The Mercury and Air Toxics Standards required these actions within a much shorter compliance timeframe than the Clean Power Plan: approximately three years, with case-by-case extensions of up to two additional years.[10]

28. Despite this more restrictive compliance framework, and significant public debate and industry outcry over the reliability implications of the Mercury and Air Toxics Standards,[11] the nation's electric sector has taken steps to come into compliance with those standards without any major reliability incidents and without any significant impact on the nation's electricity rates. Moreover, power companies are achieving the required toxic emissions reductions under the standard at a fraction of the costs predicted.[12]

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[9] *See id.* at 9,385–86.
[10] *See id.* at 9,407–11.
[11] For example, FERC held a technical conference in November 2011 that featured testimony by EPA on the forthcoming air toxics standards, as well as extensive panel discussion by grid operators and power company representatives on the reliability impacts of those standards. *See* Notice of Amended Reliability Technical Conference Agenda, 76 Fed. Reg. 73,608 (Nov. 29, 2011).
[12] *See* Declaration of James E. Staudt ¶ 5, accompanying Motion of Industry Respondent Intervenors to Govern Future Proceedings, Case No. 12-1100 et al. (D.C. Cir. Sept. 24, 2015) (estimating that the final cost of the Mercury and Air Toxics Standards is approximately one-quarter of what EPA originally estimated).

29. Indeed, I am not aware of any instance in which a Clean Air Act regulation has been responsible for endangering resource adequacy.[13] This experience is a powerful tribute to the robust system of policies, institutions, planning processes, and operating practices — described in detail above — that protects grid reliability and that will continue to serve this function as the Clean Power Plan is implemented. It is also indicates that the power sector will readily be able to plan for and adjust to the requirements of the Clean Power Plan, with its lengthy implementation deadlines and extensive compliance flexibilities.

The Clean Power Plan also contains additional measures specifically designed to ensure continued grid reliability.

30. The extensive flexibilities the Clean Power Plan provides, as described above, remain the most significant mechanism in the rule to maintain reliability. In addition, the Clean Power Plan includes several complementary protections to create layered reliability safeguards. FERC helped inform many of these additions to the final Clean Power Plan, both by

[13] *Accord* Susan Tierney et al., Analysis Grp., *Electric System Reliability and EPA's Clean Power Plan: Tools and Practices* 19 n.34 (Feb. 2015) ("To our knowledge, there has never been a resource adequacy event (e.g., a brownout or blackout) due to implementation of an environmental regulation.").

convening extensive technical hearings on the Clean Power Plan and by providing input directly to EPA.[14]

31. These additional safeguards include a requirement that states consider reliability impacts when developing plans.[15] In addition, EPA has provided states with the ability to modify state plans over time in order to address new circumstances that could have reliability impacts. And the final rule includes a Reliability Safety Valve — which directly responded to a recommendation that FERC brought to the attention of EPA — that allows for time-limited adjustments to emission standards if needed to address a sudden, unforeseen, emergency situation that has the potential to threaten grid reliability.[16]

32. Additionally, EPA has entered into an agreement with FERC and the Department of Energy that provides for the monitoring of state plan development and implementation activities, clarifies the roles of the three respective agencies with respect to Clean Power Plan implementation, and

[14] Letter from Chairman Norman Bay and Commissioners Tony Clark, Collette Honorable, Cheryl LaFleur, and Philip Moeller to Janet McCabe, Acting Assistant Administrator for Air and Radiation, EPA (May 15, 2015), available at https://www.ferc.gov/media/headlines/2015/ferc-letter-epa.pdf.
[15] Final Clean Power Plan, 80 Fed. Reg. at 64,946 (to be codified at 40 C.F.R. § 60.5745(a)(7)).
[16] As FERC noted in its letter to EPA, the Reliability Safety Valve was one of the major recommendations from panelists at the technical hearings.

ensures regular coordination among the three agencies in order to ensure grid reliability is maintained.

33. Taken together, these numerous flexibilities and safeguards discussed above and in preceding sections of this declaration ensure that the Clean Power Plan will be no more challenging, and most likely less challenging, for grid operators than other legal, regulatory, or economic factors that affect generating sources.

34. EPA prepared a Technical Support Document on Resource Adequacy and Reliability Analysis that provides further support for the power sector's ability to accommodate Clean Power Plan requirements. Based on an evaluation of current and anticipated generating capacity, transmission infrastructure, and other factors, EPA concluded, "[P]ower system impacts of the final rule on system operations, under conditions preserving resource adequacy, are modest and manageable."[17]

35. Grid operators and planners routinely and necessarily include laws, rules, and public policies as factors in assessing reliability, making decisions, and forecasting. Indeed, these assessments are proactively contemplated — FERC Order 1000, for example, requires that regional and interregional

[17] EPA, Technical Support Document: Resource Adequacy and Reliability Analysis 1 (Aug. 2015).

transmission planning processes include public policy considerations. The Clean Power Plan is no different.

As with prior air regulations for the power sector, the Clean Power Plan does not intrude on the jurisdiction of state or federal electricity regulators.

36. Several of the declarations filed by stay movants allege that the Clean Power Plan intrudes on matters that are under the jurisdiction of FERC or the state Public Utility Commissions. These allegations are misplaced. As I describe below, the Clean Power Plan provides only for states to establish and implement emission limitations for carbon dioxide-emitting power plants in a manner that closely parallels other well-established Clean Air Act programs. State (and federal) plans limiting power plants' carbon dioxide emissions do not alter in any material way the authority or responsibilities of FERC or state Public Utility Commissions. There is no provision of the Clean Power Plan that would require such alteration.

37. To be sure, the Clean Power Plan's emission limits — like countless other environmental and air quality regulations — can incidentally affect the relative costs of different types of generation, and cause power companies and other entities to invest in different types of energy infrastructure than they would otherwise. Such effects are typical when state or federal environmental requirements change, and energy regulators routinely take

such effects into account when carrying out their functions. Environmental requirements are just one part of the complex factual context that FERC and the state Public Utility Commissions respond to every day — together with market forces (such as long-term changes in fuel prices) and other public policy decisions that affect the energy system (such as labor policies and state clean energy policies).

38. The Clean Power Plan provides that state plans must establish emission limitations for covered carbon dioxide-emitting power plants. No non-emitting entity is required to be subject to regulation under the Clean Power Plan. [18] Further, emission limitations under the Clean Power Plan could closely resemble prior Clean Air Act programs as well as existing state programs for reducing carbon pollution from the power sector. For example, EPA's Cross-State Air Pollution Rule — which applies to many of the states that have moved for a stay — established state-wide emission budgets for nitrogen oxides and sulfur dioxide from existing power plants, and

[18] *See, e.g.*, Clean Power Plan, 80 Fed. Reg. at 64,783 ("EPA is neither requiring nor authorizing the states to regulate non-affected EGUs in their CAA section 111(d) plans."); *id.* at 64,785 ("[I]n this rule, the EPA is not attempting to subject any entity other than the affected EGUs in the source category to CAA section 111 requirements. . . . [T]his final rule does not require or authorize the states to include entities other than affected EGUs in their CAA section 111(d) state plans, and as a result, those entities will not come under CAA jurisdiction and the parts of the economy that they represent will not be regulated by the EPA.").

promulgated federal implementation plans that ensured those budgets would be met through emissions trading systems similar to those that could be established under the Clean Power Plan.[19] Many states adopted implementation plans that reflected the same basic framework under the predecessor to the Cross-State Air Pollution Rule, known as the Clean Air Interstate Rule.

39. Nor would additional action, including regulation of non-covered electric generating units, be necessary in order to achieve emission limitations under an appropriately designed state or federal plan.[20] Emissions trading systems such as those permitted by the Clean Power Plan are designed to facilitate least-cost emissions reductions by creating economic incentives that encourage low- or zero-emitting generation relative to high-emitting generation. In other words, these systems create incentives that are designed to automatically encourage shifts in dispatch, deployment of new renewable energy and energy efficiency, and other emission reduction measures without central planning or mandates from the Public Utility Commission or other regulatory agencies.

[19] See *id.* at 64,772 (describing CSAPR and associated federal implementation plan).

40. Nothing in the final rule in any way places obligations on FERC. None of FERC's authorities under the Federal Power Act, discussed in detail above, would be in any way diminished or altered under the Clean Power Plan.

41. Nor does the Clean Power Plan in any way place obligations on state Public Utility Commissions, or disturb the traditional authority that state Public Utility Commissions have exercised over retail rates, intrastate distribution, infrastructure siting and construction, and other issues. As noted above, the Clean Power Plan gives states many choices over how state plans should be structured and provides power companies with significant flexibility as to how, when, and where emission reductions from affected sources should be obtained. As with prior Clean Air Act regulations and other environmental requirements, power companies will ultimately determine what compliance pathways are most feasible and cost-effective based on the plan architecture that state environmental regulators have chosen. In states without competitive markets, state Public Utility Commissions will continue to determine what infrastructure projects should go forward, what investments by power companies should be approved, and what compliance costs should be folded into retail rates.

42. Electricity regulators are familiar with many of the strategies that affected units could use to reduce their emissions. The ongoing transition in electricity

generation resources, coupled with past state and federal policy, has given grid regulators ample experience in integrating into the electric grid such strategies as increased natural gas generation, new renewable generation, energy efficiency programs, run-time restrictions, and market-based pollution control programs.

States have considerable flexibility in creating low-cost designs.

43. The Clean Power Plan is not only crafted to support grid reliability, but economic access to energy as well. Opportunities to minimize compliance costs are integral to the rule's design, and electric bills are expected to be lower with the CPP in 2025 and 2030 than under a baseline scenario.

44. The modest compliance costs associated with the CPP are largely a product of the rule's various compliance flexibilities, described above. In states where implementation plans allow for compliance by emissions trading, the benefits of flexibility are especially pronounced. In a trading program, an affected unit can purchase emission credits or allowances from whoever is able to produce them most efficiently. The unit can thereby benefit from the full variety of emission reduction opportunities available to any participant in the market, including opportunities the unit does not implement directly. A state may allow electric generating units to engage in intrastate or even interstate trading; more robust markets will offer correspondingly larger

benefits. Based on past experience, trading program participation will be quite feasible. Many states, units, and grid operators are familiar with emissions trading, which has long proven efficient and effective for compliance with other air quality regulations. Moreover, ten states already engage in trading for carbon emissions from electric generating units.

45. While units are free to reduce emissions through technological upgrades to their physical assets, numerous other compliance pathways exist. Many of these pathways, including demand response, energy efficiency, and renewable energy programs, provide low-cost options to reduce emissions.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 4th day of Dec., 2015, in San Francisco CA.

Jon Wellinghoff

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

DECLARATION OF ERIC B. SVENSON, JR.

I, Eric B. Svenson, Jr., declare:

1. I am the CEO and President of The Svenson Group LLC, 18 Ballantine Road, Mendham, New Jersey, 07945. I provide consulting services to clients primarily to analyze, assess, and make recommendations regarding federal and state energy and environmental policies and their implementation. I have both a Bachelor of Engineering (1973) and Master of Engineering – Mechanical (1976) from Stevens Institute of Technology.

2. I have worked in the electric utility/power industry for over 39 years, including in power plant operations, engineering and construction, business strategy and planning, energy and environmental policy, environment and health and safety (EHS) compliance, and environmental remediation of legacy operations. Through the period 2000 to my retirement in July 2012, I held a number of senior management responsibilities at my former employer, Public Service Enterprise Group (PSEG), a

Fortune 300 electric and gas energy company with a large portfolio of coal, natural gas, oil, and nuclear electric generation in the Northeast, and a growing portfolio of renewable energy generation across the United States. During my last six years at PSEG, I was Vice President – EHS, and in my last two years I directed PSEG's business response to emerging federal, regional and state energy policies.

3. My experience at PSEG over for the last third of my career is particularly pertinent to the issues raised by litigants in this proceeding, specifically: electric system reliability; resource adequacy; and the ability of the electric industry to adapt and comply with the Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan"). I have extensive experience on Clean Air Act compliance matters as it relates to the electric power industry, including: permitting of electric generating sources; emissions trading; and state implementation planning. I also have extensive experience on energy matters pertaining to electric wholesale power markets, their operation, Federal Energy Regulatory Commission (FERC) regulation and oversight of these markets, and transmission planning, permitting, and construction.

4. The purpose of my declaration is to help the Court answer the question of whether states or other parties will suffer irreparable harm absent a stay of the Clean Power Plan. Several movants claim that if the Court fails to stay the Clean Power Plan, irreparable harm will result to the reliability of the electric bulk power system during the pendency of the Court's review of the rule. They also allege longer-term

reliability impacts. As I explain below, it is my opinion that these claims are unfounded and incorrect:

- There will be no reliability impacts attributable to the Clean Power Plan during this Court's review because the Plan imposes no requirements on power plants in this near-term period.
- Through the regular, on-going activities of grid planners, regulators, and market participants, the bulk power electric system has, and will continue to have, more than adequate resources to accommodate Clean Power Plan requirements as we approach the effective date of its emission limits in 2022, and thereafter.
- Grid regulators, utilities, power plant owners and others have deep and proven experience in solving unforeseen grid reliability issues.
- The Clean Power Plan includes multiple safeguards to protect reliability, including long compliance lead times, and a flexible compliance structure.
- Fears that renewable energy resources will destabilize the grid are meritless, and disproved by the successful integration of many thousands of megawatts of renewable energy resources into the grid.

5. This declaration is based on my education, experience, and a review of materials I gathered. I have also reviewed declarations attached to various stay motions, in addition to declarations supporting the environmental movant-intervenors prepared by Susan Tierney and former FERC Chairman Jon Wellinghoff.

A. The nation's electric grid today is highly reliable, robustly designed, and has sufficient reserve margins of electric generating capacity to accommodate Clean Power Plan compliance planning.

6. The electric power system in the U.S. is designed to maintain reliability even in the event of disruptive events, such as facility outages, fuel price volatility, unexpected increases in customer demand, and severe weather events. It is also designed to ensure reliability even in the midst of dynamic economic and regulatory market transitions, such as the current transition, which is driven by low-cost, domestic production of natural gas and the increased competitiveness of wind, solar, and other renewable energy to supply reliable electric power.

7. FERC-regulated electric system planners conduct long-term resource adequacy studies or consult with utilities in their region to ensure that there are sufficient resources available to satisfy the demand for electricity on peak demand days. These regions cover the entire country. States with integrated resource planning requirements, all of which also are in FERC-regulated planning regions, also conduct long-term planning to assure resource adequacy. The electric system planners, and utilities in states with integrated resource planning requirements, evaluate a number of factors to assure that the supply of electricity is sufficient to meet consumer needs. They also identify an additional amount of supply, known as reserves, to account for unexpectedly high demand attributable to unexpected weather events and power plant failures.

8. The resources these planners evaluate include: generating facilities; transmission lines and related equipment; interconnections with neighboring power systems; and demand side resources which the grid operator can dispatch or otherwise count on to

balance the system's supply and demand.[1] The system is designed to maintain reliable and dependable service during not only steady-state conditions, but also during infrequent events such as outages of electric generating units, transmission lines, and ancillary equipment. Moreover, the grid consists not simply of physical infrastructure, but also the software and systems needed to run the system, and the institutional infrastructure of organizations, market rules, and detailed planning procedures necessary to run the grid reliably and efficiently.

9. A key component of the physical infrastructure necessary for a reliable grid is an adequate level of electricity generation and demand-side management resources. There are a number of different approaches that can accomplish this. An approach that the PJM Interconnection (PJM) and the New England Independent System Operator (ISO-New England) employ is a three year forward market to procure sufficient generation and demand-side resources to meet future predicted demand. These so-called "forward capacity auctions" provide valuable revenue to resource owners to supplement the compensation they receive in the separate markets for energy and "ancillary services" (grid reliability services such as frequency control, reactive power and voltage control, and "spinning reserve" for fast load response). For example, PJM, the regional transmission organization for a large section of the Mid-Atlantic and Midwest, recently conducted its latest annual forward capacity auction in order to plan for future electric system reliability. Its auction requires

[1] Demand-side resources refer primarily to: (1) energy efficiency; and (2) demand response, which is customer-driven reductions in power use in response to electricity prices.

owners of power plants and demand-side resources to commit three years in advance to provide generating capacity or demand reduction whenever called upon to assure reliability. On August 21, 2015, PJM announced the results of its most recent auction, which covers the 2018/2019 delivery year. The results show that the region was able to secure an ample supply of energy resources to maintain reliability: over 166,000 megawatts (MW) of capacity, representing a 19.8 percent reserve margin for the RTO area. That reserve margin is a very healthy level and well exceeds industry standards. Additionally, while a majority of winning bids ("cleared capacity") came from existing power plants, demand-side resources successfully bid to provide approximately 12,000 MW of this capacity, more than 4 times the amount of capacity to be provided by new generation that cleared the auction. The high level of demand-side resources in PJM's auction indicates that increases in system demand can be met by non-generation sources as well as conventional physical generation assets.[2]

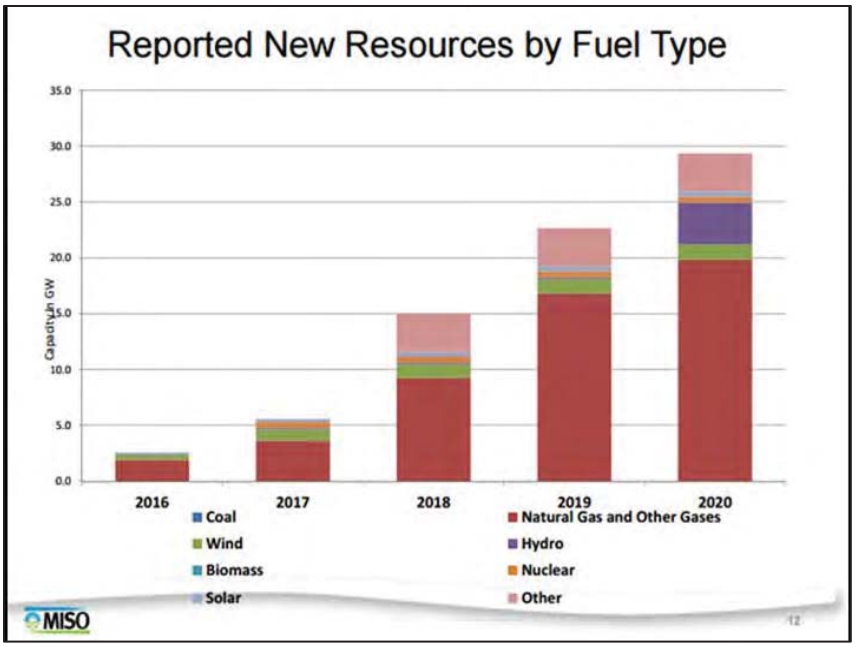
10. The Midcontinent Independent System Operator (MISO), a coal-heavy FERC-regulated regional transmission organization in the Midwest and Middle South, does not conduct a PJM-style mandatory forward capacity auction, in part because the utilities in most of the states in its footprint are responsible for resource planning and expansion. However, MISO's most recent (July 2015) survey of states in its footprint shows that MISO, like PJM, has sufficient reserves at least through 2019.[3] By then, of

[2] See PJM Interconnection LLC, "2018/2019 RPM Base Residual Auction Results" (August 2015), available at http://www.pjm.com/~/media/879A2FA2A1794C7887A98686A70336D2.ashx.

[3] MISO, "2015 Organization of MISO States MISO Survey Results"(July 2015), available at

course, states and MISO will have taken other actions to continue to bolster reserve margins, as they do now, to preserve reliability beyond 2019.

11. Among the reasons MISO will maintain its reserve margins is that, according to its 2015 survey, nearly 30,000 MW of new generation resources of all types will be built by 2020 in the MISO region:[4]



12. For the nation as a whole, the North American Electric Reliability Corporation (NERC) conducts periodic assessments of the nation's bulk power system. NERC's primary responsibilities, established by statute, include developing detailed grid reliability standards and periodically assessing the grid's long-term health. NERC's

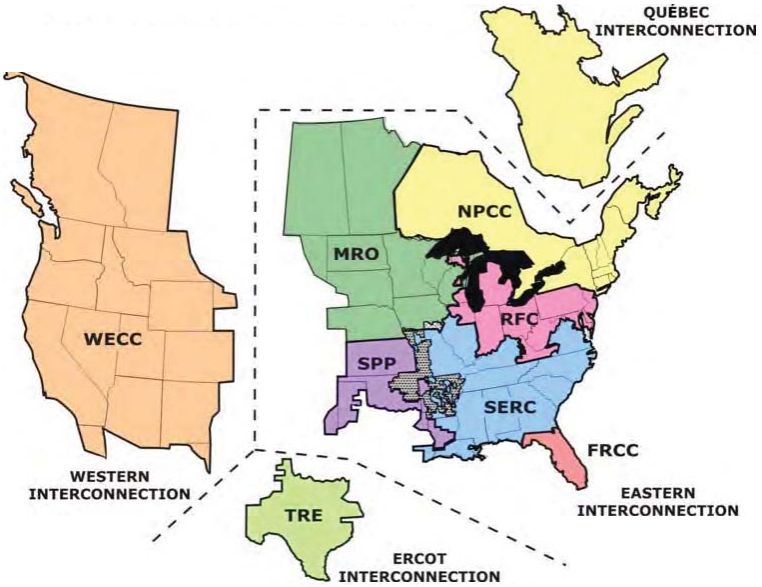
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https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/SAWG/2015/20150709/20150709%20SAWG%20Item%2002%202015%20OMS-MISO%20Survey%20Results.pdf.

[4] MISO Survey, supra n. 3, at slide 12.

assessments examine the country's entire high power transmission grid, which consists of the Western, Eastern, and Texas Interconnections:

NERC INTERCONNECTIONS[5]



13. Among other things, NERC's assessments examine whether supply reserve margins (an insurance pool of additional power capacity) are adequate to maintain reliability in the event of disruptive events such as facility outages, fuel price volatility, unexpected increases in customer demand, and severe weather events – even in the midst of dynamic economic and regulatory market transitions. In its most recent assessment, the NERC 2015 Summer Reliability Report (the "NERC 2015 Summer Assessment"), NERC determined that sufficient electric generating resources are available nationwide to assure reliability in all regions of the country during 2015's

[5] NERC Interconnections, available at http://www.nerc.com/AboutNERC/keyplayers/Documents/NERC_Interconnections_Color_072512.jpg. (The Western and Eastern Interconnections include Canadian provinces, and Quebec is a separate NERC Interconnection).

summer electric peak demand. Specifically, for the three large transmission regions of the country (the Eastern Interconnection, the Texas Interconnection, and the Western Interconnection) the report found anticipated reserve margins exceeded the region-specific reference margins by 14.3, 2.5, and 11.3 percentage points, respectively. This excess constitutes additional "insurance" that in the near term helps to further ensure sufficient resource adequacy and therefore grid reliability, even if generating retirements in the near term are more than expected.[6]

14. The specific dynamics of each Interconnection indicate that these reserve margins will be sufficiency maintained at least throughout the period this Court takes to review the Clean Power Plan. The Texas Interconnection, which had the smallest reserve margin identified in the 2015 Summer Assessment, has seen significant recent growth in generating resources. Between the previous 2014 Summer Assessment and this 2015 Summer Assessment, 2,100 MW of new natural gas combined cycle (NGCC) electric generation, approximately 68 MW of solar power generation, and 1,600 MW of new wind generation were added to the grid. These new additions alone account for a 3.2 percent growth in Texas Interconnection generating resources within a period of slightly over a year. This growth, largely of renewable electric generation, will help to ensure that Texas maintains a sufficient reserve margin through the stay period.

[6] See NERC, "2015 Summer Reliability Assessment" (May 2015), available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015_Summer_Reliability_Assessment.pdf.

15. Similarly, NERC's assessment of the Eastern and Western Interconnections show sufficient planned energy resources to maintain the required reserve margins. NERC subdivides these interconnections into sub-region assessment areas. NERC's Summer 2015 Assessment shows that all sub-regions have excess reserve margins.[7]

16. FERC-regulated electricity markets and other programs also continue to strengthen reliability in the near term. FERC's recent 2015-16 Winter Energy Market Assessment[8] paints a more than satisfactory picture of reliability through the end of March 2016, attributable in part to record high natural gas storage, lower overall energy prices, more grid resiliency projects, and more new natural gas pipelines.

17. New generation of all fuel types continues to be built across the country to meet future demand. FERC's most recent monthly Energy Infrastructure Update reports that nearly 9,600 megawatts (MW) of new generation resources (primarily natural gas, wind, and solar) were interconnected to the grid in January through October 2015.[9] For all of 2014, 15,384 MW of new resources were added nationwide,

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[7] NERC has also conducted winter period reliability assessments, the most recent released in November 2014. Overall, the regions and sub-regions have excess reserve margins over and beyond what NERC has deemed necessary for resource adequacy and reliability. See NERC, "2014-2015 Winter Reliability Assessment" (November 2014), available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014WRA_final.pdf.

[8] FERC, "2015-1016 Winter Energy Market Assessment" (October 2015), available at http://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2015/10-15-15-A-3.pdf.

[9] FERC, Office of Energy Projects, "Energy Infrastructure Update for October 2015," available at http://www.ferc.gov/legal/staff-reports/2015/oct-infrastructure.pdf.

including 7,485 MW of natural gas, 4,080 MW of wind, 3,139 MW of utility-scale solar, and even 1,543 MW of coal. FERC's data does not include significant new energy efficiency measures and distributed solar resources that reduce the need for new large-scale generation resources.

18. Adequate transmission infrastructure also is necessary to maintain reliability. The nation's utilities and other owners of transmission continue to add and upgrade electric transmission assets to support reliability by strengthening the backbone of the grid, reducing power flow congestion, and strengthening ties between regions. A major function of PJM, MISO, and all other FERC-regulated market regions is to conduct long-term planning to identify new transmission lines necessary to maintain reliability in the future by delivering power in and across grid regions. Among other things, these lines can be used to bring more power into an area when necessary to make up for the power produced by a retiring coal plant.

19. Significant investments are occurring in new transmission infrastructure across the country. The U.S. Department of Energy (DOE)'s annual transmission review identified that transmission investments in 2013 totaled $17 billion, and that another $78 billion of investment is expected for the period 2014-17. These investments demonstrate that considerable grid development is occurring in anticipation of system changes that include changes in consumer demand for power, changing power flows across regions, new power plant additions and retirements, and other factors.

20. Prospective analyses show that transmission needs under the Clean Power Plan are in line with – or may even be less – than business-as-usual requirements. The DOE's Quadrennial Energy Report analyzed transmissions requirements under 23

cases, some of which included a carbon emission limit similar to the mass-based emission targets under the Clean Power Plan. The base case (i.e., business as usual, without carbon limits) projections in DOE's analysis showed transmission investments through 2030 do not exceed historical yearly build rates. However, multiple cases modeling carbon limits project transmission requirements *below* this base case level, indicating that certain implementation pathways under the Clean Power Plan could in fact reduce transmission needs. DOE also notes that "even for those 'high transmission' cases, 5-year transmission investment levels were not more than 1 percent greater than historical investment rates."[10]

21. Focusing just on transmission *reliability* needs, very little incremental transmission will be necessary to meet reliability requirements attributable solely to the Clean Power Plan; ICF, for example, estimated only $1.5 to $2.5 billion in upgrades necessary under the proposed Clean Power Plan by the start of the first compliance period – which under the final Clean Power Plan is over six years from now.[11] That is more than sufficient time for the upgrades to take place after the Court concludes review of the Clean Power Plan.

22. In summary, the nation's three major power grids (Eastern, Western, and Texas) have electric generating reserve margins that exceed levels NERC deems to be

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[10] Dept. of Energy, Quadrennial Energy Review, App. C, Electricity 31 (April 2015), available at http://energy.gov/sites/prod/files/2015/07/f24/ElectricityAppendix.pdf.

[11] ICF, Clean Power Plan Transmission Investments: It's Not How Much, It's How Soon (March 2015), available at http://www.icfi.com/insights/white-papers/2015/clean-power-plan-transmission-investments.

necessary to meet anticipated electric consumer demand. Moreover, the levels of investment already planned by utilities and other market participants of new generation, transmission, and demand side management resources ensure a reliable grid while this Court reviews the Clean Power Plan rule.

B. The Clean Power Plan includes multiple safeguards to protect reliability, including long compliance lead times and a flexible compliance structure.

23. Several state utility regulators have suggested that implementation of the Clean Power Plan threatens the reliability of the electric power system because it does not allow sufficient time to comply with its greenhouse reduction goals.[12] These declarants mischaracterize both the flexibilities of the Clean Power Plan's design and the robustness of the electric power system. The concerns they raise, even if they were accurate (and they are not), would not materialize in the period of this litigation.

24. Among other things, these declarants ignore the important changes that EPA made in the final rule to address reliability and planning concerns raised by many of the same parties on the draft rule. For example, EPA extended the start of the Clean Power Plan's initial compliance period by two years, such that states and industry now have more than six years to prepare before the program goes into effect in 2022. Additionally, compliance is not measured at the start of 2022, but rather after the end of the first interim compliance period of December 31, 2024; this is followed by subsequent two and three year periods for compliance through 2031. Compliance is

[12] See e.g., Declaration of Brian H. Lloyd (Texas) ¶ 6, accompanying Motion of State Petitioners.

met either as an average rate or cumulative emissions over each multi-year compliance period. This gives states more flexibility within a period and throughout the program to determine an appropriate and reliable emissions reduction path.

25. As in the recent past, power plant and coal mine closures that occur during the period of Court review will be driven not by the Clean Power Plan, but by economic trends that render those facilities uncompetitive, including sustained low electric market wholesale prices due to the widely available, low-cost natural gas, making older and inefficient coal plants unprofitable. States have up to three years to submit their compliance plans, and power plants have more than six years until they become subject to the initial interim compliance period of 2022-24 – well beyond the time it will take for the Court to decide the petitions for review of the Clean Power Plan. Additionally, under-construction nuclear power plants in Georgia, South Carolina, and Tennessee will all count toward compliance.[13]

26. In addition, as previously explained, electric utilities and transmission providers are already in the process of enhancing the robustness of the electric system. DOE projects approximately $78 billion of transmission investment over the period 2014-17.[14] This will modernize and strengthen the grid, and allow more power to flow from existing and planned power plants to consumers. The additional infrastructure will also reduce transmission line losses (losses of electricity in transmission between the point of generation and use). Fewer line losses mean that less generation is required to serve end-use demand, and can contribute to emissions reductions.

[13] See 80 Fed. Reg. at 64901-02.
[14] U.S. Dept. of Energy, supra, at 10.

27. Movant arguments vastly exaggerate the lead times that are required for adding generating resources, new electric transmission, and new natural gas pipelines. Additionally, they exaggerate the need to "lock in" investment commitments to those resources immediately unless the Court grants a stay. Their claims imply that electric market participants will commit significant sums of capital without adequate consideration of potentially less costly alternatives, or the option value of deferring actions until important factors (e.g. state policy design) are resolved. Rather, in my view, it is highly likely that already-planned additions of clean energy resources (given many states' existing renewable and energy efficiency programs) will allow some states to *over* comply relative to the interim and final targets without making further investments. Therefore, owners of affected sources claiming that significant and immediate investments are required to meet Clean Power Plan targets have the option to first seek emission credit or allowance trading opportunities with other affected sources to meet their compliance requirements. With such alternatives likely available, which require no advance commitments, it is unlikely that a corporation or a public power authority, with shareholder/member fiduciary obligations or public utility commission oversight, would enter into significant financial commitments because of the Clean Power Plan in the period it takes the Court to render its decision.

28. The opportunity for interstate trading of carbon credits or allowances is one of the examples of the Clean Power Plan's implementation flexibilities, specifically designed to allow sources to reliably and affordably reduce carbon pollution over time. Compliance options such as averaging, trading, and other market-based mechanisms encourage and facilitate a wide diversity of compliance solutions and help

to ensure a reliable power system**.** Market-based regulatory approaches allow even a high-emitting coal-fired generator that may be critical to reliability (for example, due to the outage of another plant nearby) to continue operating in compliance, by purchasing emissions credits or allowances from other coal- or gas-fired power plants or from renewable power facilities.

29. Finally, as other declarants explain in detail,[15] the Clean Power Plan includes three additional grid reliability protections: (1) states must demonstrate that they considered grid reliability issues in developing their compliance plans; (2) states may request plan revisions necessary to address changes in circumstances that could have reliability impacts; and (3) states can access a "reliability safety valve" to allow an affected generator to temporarily exceed emission standards without penalty in the event of an immediate, unforeseen, emergency situation that threatens reliability. I support these provisions and believe that they adequately address any potential and unexpected grid reliability issues that could occur during Clean Power Plan implementation.

30. In short, the rule provides a long lead time to comply, and with the credit that EPA provides to states for existing and planned energy projects, coupled with the flexible compliance options in the rule, there shouldn't be a need to make large capital commitments or costly irreversible resource decisions until after this Court renders a decision on the rule.

[15] See Declarations of Susan Tierney and Jon Wellinghoff.

C. Federal and state energy and environmental regulators, regional grid operators, and utility and market participants have proven experience in responding promptly to unforeseen grid reliability issues.

31. Over the past decades, federal and state regulators, utilities, and electric grid operators have worked routinely with generation owners to facilitate compliance with new environmental standards while maintaining grid reliability. Some of these prior standards were more prescriptive than the Clean Power Plan in that they required individual electric generating sources to meet specific levels of environmental control, and under shorter compliance timelines than the Clean Power Plan provides.

32. For example, the Mercury and Air Toxics Standards (MATS)[16] required the retrofit, switch to gas, or closure of a large number of coal-fired power units in a matter of less than five years – a much tighter timeline than the Clean Power Plan provides. More than 13 gigawatts (GW – each gigawatt is 1,000 MW) of capacity retrofitted to install controls in 2013-14 alone.[17] Reliability has been maintained as more than 9.7 GW of electric generating resources retired in 2013-14, and an additional 12 GW retired (or projected to be retired) in 2015.[18] These retirements

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[16] National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 Fed. Reg. 9,304, 9,424 (Feb. 16, 2012).

[17] M.J. Bradley & Associates, "MATS Compliance Extension Status Update Issue Brief" (June 2015), available at http://www.mjbradley.com/sites/default/files/MATS%20Compliance%20Extension%20Update.pdf.

[18] Christian, M. and Powell, N.E., SNL, "With MATS in effect, coal unit retirements to hit peak in 2015," https://www.snl.com/InteractiveX/Article.aspx?cdid=A-32607383-

were due to a combination of economic factors, such as the low price of natural gas and renewables, as well as regulatory requirements. Compliance with the rule began on April 16, 2015, and the grid has experienced no resulting decrease in reliable service.[19]

33. Ozone smog standards also imposed strict limits on individual generators, and states and regulators appropriately responded to meet these targets while maintaining reliability. For example, New Jersey's Department of Environmental Protection adopted a High Electric Demand Day (HEDD) environmental rule in 2009 that required more than 7,800 MW of fossil steam electric boilers and simple cycle combustion turbines to meet a stringent emission reduction standard of oxides of nitrogen (NOx), with about 30 percent of the reduction to be achieved by 2009, 60 percent by May 2015, and the remainder by no later than June 1, 2017.[20] This generation represented approximately 43% of New Jersey's in-state electric supply capacity. This standard, and a combination of other market forces, resulted in the retirement of over 1,700 MW of in-state generation in relatively short period of time.

34. To ensure sufficient energy resources to meet demand, New Jersey established a number of in-state programs and incentives for new natural gas combined cycle

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[19] While the United States Supreme Court has remanded the MATS rule to EPA in order for the agency to conduct further cost analysis of the rule, *Michigan v. EPA*, 135 S. Ct. 2699 (2015), the program compliance requirements remain in place.

[20] See O'Sullivan, P.E., NJDEP, "Air Quality Regulation of Electric Generating Units" (June 2010), available at http://www.state.nj.us/bpu/pdf/energy/OSULLIVAN%20NJDEP.pdf.

generation, new renewable investments, and investments in demand side programs. In this same period of time, the regional wholesale market operator, PJM, provided through its three year forward capacity auction discussed above the pricing signals needed to induce market participants to add needed additional generating and demand side resources. Additionally, to address changes in New Jersey and regional generating resources, regional power flows, and to reinforce the grid from severe weather events like Hurricane Sandy, PJM and FERC approved billions of dollars of transmission investments by the state's utilities. These actions together ensured that even this rapid adoption of a comparatively inflexible rule was achieved with no harm to reliability. Further, even with all the investments made in a very short period of time, retail electric prices in New Jersey have fallen by over three percent – the state has dropped from having the fourth highest electricity prices in the nation to the tenth highest.[21]

35. As the MATS and ozone experiences discussed above indicate, grid operators are adept at managing the transmission system through significant levels of plant retirements. They can accelerate planned transmission projects, temporarily adjust grid operations rules, and even pay power plants to remain on line until transmission upgrades are complete. PJM, for example, has accepted nearly 31,000 MW of power plant retirements since 2003, and in most cases it found either no reliability impacts because some combination of the existing transmission system, planned upgrades, and

[21] New Jersey Board of Public Utilities and New Jersey Department of Environmental Protection, "New Jersey Energy Master Plan Update" 3 (November 2015), available at http://nj.gov/emp/docs/pdf/EMP_Update_For_Public_Comment_11-20-15.pdf.

new resources avoided reliability problems. In only a handful of cases has PJM needed to compensate power plants to remain on line until upgrades were complete.[22] MISO and the other grid planning regions perform analyses similar to PJM's to assure that plant retirements do not impact reliability.[23]

36. The nation's bulk electric power system has proven to be resilient to many changes, including market changes, severe weather events, and compliance with new regulatory programs. Given the long compliance lead times afforded in the Clean Power Plan rule, the rule's flexibility and the large array of compliance approaches EPA has provided states, electric system reliability will not be adversely affected during the pendency of the litigation or beyond. EPA recognized that ensuring reliability is a continual process that requires on-going coordination and engagement among states, industry, system operators, and regulators as they plan for the future.

D. Movants' arguments that the Clean Power Plan will require adding more renewable energy resources than the grid can reliably accommodate are without merit.

37. Some Movants argue that the Clean Power Plan will result in the addition of more wind, solar, and other renewable energy than the grid can accommodate without adversely affecting grid reliability.[24] These arguments are without merit. The renewable energy development even without the Clean Power Plan is projected to

[22] See PJM, "Generation Deactivation Report" (December 2015), available at http://www.pjm.com/~/media/planning/gen-retire/generator-deactivations.ashx.

[23] E.g., MISO, Generation Change of Status Requests, available at http://www.oasis.oati.com/woa/docs/MISO/MISOdocs/Attachment_Y_Requests_with_Reliability_Issues.pdf.

[24] See e.g., Declaration of Brian H. Lloyd ¶ 33, accompanying Motion of State Petitioners.

increase significantly due to actions that states have already planned and incorporated into reliability assessments. Additionally, as the facts on the ground demonstrate, and studies confirm, integration of renewables at much higher penetrations than envisioned under the Clean Power Plan can be achieved while maintaining and even improving reliability.

38. Due to existing state policies, existing Federal and state incentives, renewable portfolio standards, rapidly declining costs, and other market forces, the nation is on course to add a majority of the renewable energy that EPA projects to occur under the Clean Power Plan's final standards. Because of these forces, more renewable energy is flowing through the power grid today than ever before. At times, wind has supplied more than 60 percent of the electricity on some utility systems, without reliability problems. Solar power now routinely contributes 10-15 percent of midday electricity demand in California.[25] Due to more precise weather forecasts and sophisticated technologies, grid operators increasingly can predict and control wind and solar generation levels.[26] Using advanced and often automatic control systems, grid operators can both increase and decrease the power output into the grid, which helps to stabilize its electrical frequency and maintain reliability.[27]

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[25] California ISO, "Today's Outlook: Renewables," http://www.caiso.com/Pages/TodaysOutlook.aspx#Renewables (accessed November 25, 2015).

[26] Lori Bird and Michael Milligan, "Lessons from Large-Scale Renewable Energy Integration Studies, Preprint" (paper, 2012 World Renewable Energy Forum, Denver, May 13–17, 2012), § 3.4, http://www.nrel.gov/docs/fy12osti/54666.pdf (accessed December 2, 2015).

[27] National Renewable Energy Laboratory, "Variable Renewable Generation Can Provide Balancing Control to the Electric Power System," NREL/FS-5500-57820, www.nrel.gov/docs/ fy13osti/57820.pdf (accessed December 2, 2015).

39. EPA's projections of new renewable energy are aligned with recent trends and are not significantly different than what reliability coordinators are already planning for today. EPA's estimates of potential new renewable energy that will be developed under the Clean Power Plan are based on its use of the Integrated Planning Model (IPM) to project operation of the nation's power grid through 2030, both under Clean Power Plan implementation and under "business as usual" conditions (i.e. without the Clean Power Plan implemented). Under this modeling, EPA estimated that between 81 and 84 GW of new (post-2014) non-hydroelectric renewable capacity would be developed by 2030 to comply with the final Clean Power Plan targets. However, this modeling indicates that only roughly 18 to 20 GW of the 84 GW added would be an incremental result of Clean Power Plan implementation; the rest is already cost-effective under business as usual projections. Furthermore, much of this incremental (i.e. beyond business-as-usual) development is projected for the later years of the program, meaning that many states will likely be able to continue under business as usual renewable development pathways for the short term. This will allow more time for states to plan for the reliable integration of any additional renewable resources.[28] Importantly, reliability coordinators are already planning for this renewable growth. NERC projected similar levels of renewable additions (74.2 GW of wind additions and 14.3 GW of solar additions by 2024) in its 2014 Long-Term Reliability

[28] See EPA, "Technical Support Document: Resource Adequacy and Reliability Analysis" (August 2015), available at http://www2.epa.gov/sites/production/files/2015-11/documents/tsd-cpp-adequacy-reliability.pdf.

Assessment, November 2014, without making assumptions concerning the Clean Power Plan in its modeling.[29] Furthermore, NERC notes that approximately 60 percent of the new renewables it anticipates to be added to the grid by 2024 will *not* require additional transmission, and that regional grid operators are starting to plan for the transmission that will be necessary for the remaining renewable energy additions projected at this time.

40. Recent analyses show that high penetrations of renewable energy are feasible. Detailed analyses performed on the PJM grid, the Eastern Interconnection, and Western Interconnection found that renewables can provide up to 10% of generation on major ISOs with little to no additional costs, and can provide up to 30% of total generation with only minor adjustments to the existing grid and system planning.[30]

41. In addition, some of these renewable energy additions – especially solar power – will be added to the grid as home and commercial rooftop solar installations and other "distributed energy resources." These installations avoid the need for substantial new transmission infrastructure that could be necessary for large, utility-scale projects.

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[29] NERC, "2014 Long-Term Reliability Assessment" 25 (November 2014), available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf.

[30] See GE Energy Consulting, "PJM Renewable Integration Study" (March 2014), available at http://www.pjm.com/~/media/committees-groups/task-forces/irtf/postings/pris-executive-summary.ashx; GE Energy Consulting, "Western Wind and Solar Integration Study," performed for NREL (September 2013), available at http://www.nrel.gov/electricity/transmission/western_wind.html; GE Energy Consulting, "Eastern Renewable Generation Integration Study," performed for NREL (2010), available at http://www.nrel.gov/electricity/transmission/eastern_renewable.html.

Contrary to Movants' claims, this can actually help improve reliability and strengthen the grid: for example, the National Renewable Energy Laboratory showed that increasing use of distributed energy resources helps to limit the impact of frequency disturbances that can weaken the grid.[31]

42. Similarly, a number of studies report that renewables can help improve reliability, because of the advanced controllability options of "inverter-based" commercial wind and solar facilities can be viewed as demonstrating better grid support than traditional gas- and coal-fired generators.[32] This is because the inverters of new wind and solar generators – the component that translates the direct current electricity from renewables to alternating current (AC) suitable for the grid's distribution and transmission lines – can be designed to respond more rapidly to needed system frequency than synchronous AC electric generators that are in essence large "spinning masses" with lots of inertia. (Spinning masses must be physically accelerated or decelerated in order to provide frequency regulation, whereas inverters are electronically controlled). According to these studies, wind turbines in particular can be installed such that they automatically respond to primary frequency issues on

[31] Miller et al., National Renewable Energy Laboratory, "Western Wind and Solar Integration Study Phase 3 – Frequency Response and Transient Stability" 15 (December 2014), available at http://www.nrel.gov/docs/fy15osti/62906.pdf.

[32] See Prepared Statement of Brian Parsons, Director Western Grid Group, and John Jimison, Managing Director Energy Future Coalition (March 2015) FERC Docket No AD15-4, available at http://www.ferc.gov/CalendarFiles/20150224084400-Parsons,%20Jimison%20joint%20comments.pdf.

the grid (i.e., very fast responses to be sure that the grid remains balanced), and can be controlled by central grid planners to provide secondary frequency response.[33]

43. Additionally, both wind and solar facilities are also held to the same reliability standards as conventional power plants, meaning that these facilities are no more likely than their fossil fuel counterparts to "trip" offline during a grid disturbance.[34]

44. In summary, higher levels of renewable energy on the electric power system do not threaten reliability because: (1) on-the-ground experience shows that many regions of the country have integrated significant amounts of renewable energy generation without negatively impacts on operational reliability; (2) planning processes are in place to ensure that reliability standards are met and system planners were already anticipating a significant build out of renewable capacity regardless of the Clean Power Plan; and, (3) many tools and technology solutions exist for managing high levels of renewables.

I swear under penalty of perjury that the forgoing is true and correct.



Eric B. Svenson

Executed this 7th day of December, 2015, in Mendham, New Jersey

[33] Miller et al., supra n. 32, at 17.

[34] 18 C.F.R. Part 35, FERC Order No. 661-A on Rehearing and Clarification, Docket No. RM05-4-001 (Interconnection for Wind Energy) (December 2005), available at https://www.ferc.gov/EventCalendar/Files/20051212171744-RM05-4-001.pdf.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF WEST VIRGINIA, *et al.*, Petitioners v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Respondents	Case No. 15-1363 and Consolidated Cases

DECLARATION OF TOM SANZILLO,
INSTITUTE FOR ENERGY ECONOMICS AND FINANCIAL ANALYSIS

Introduction and Qualifications

I, Tom Sanzillo, declare:

1. I am Director of Finance for the Institute for Energy Economics and Financial Analysis ("IEEFA"). I conduct research on a range of fossil fuel issues including U.S. domestic coal markets, U.S. coal-producer and mine finance and financial regulation, and utility finance. I have researched coal and energy issues in at least twenty-five states; testified before three state Public Service Commissions; and submitted affidavits in four coal-related federal proceedings.

2. My work also includes analysis of global economic trends, coal markets and the global seaborne thermal coal trading market. I have co-authored a number of international coal market studies related to India and Australia (with our office in Sydney) and to the Norwegian pension fund, and provided oversight, research and direction on a global analysis of coal markets with Carbon Tracker Initiative. I have published a number of reports related to coal export matters on the U.S. West Coast and Gulf of Mexico.

3. From 1990 to 2007, I held various senior management positions in New York City and New York State government finance, including as First Deputy Comptroller for New York State.[1] My responsibilities included growing the assets of a $156 billion global public pension fund, which Standard & Poor's recognized as one of the best-managed such funds in the nation.

4. I have been asked to analyze declarations filed in support of motions by the National Mining Association, Utility Air Regulatory Group, and Chamber of

[1] Thomas Sanzillo, *The New York State Comptroller's Office*, The Oxford Handbook of New York State Government and Politics, Oxford University Press, 2012.

Commerce to stay the Clean Power Plan regulations ("Clean Power Plan" or "Plan"). I focused on some declarants' claims that a stay of the Plan will protect domestic coal-mining and coal-dependent utility companies from irreparable economic harm. This declaration is based on my experience, education, and review of materials I gathered, in addition to those provided to me by counsel.

Summary of Opinions

5. As I explain at Part A, the financial decline of the U.S. coal industry reflects broad, long-term, structural changes in energy markets.[2] The industry's present financial problems are largely attributable to factors that predate the Plan and are expected to continue and affect the industry for the foreseeable future. These factors include the low relative price of natural gas and renewable sources of electricity, a weak coal export market, and increased production costs and debt levels for coal companies. A stay of the Plan for the period of time it will take this Court to review its legality (which I assume would be on the order of a year to eighteen months) would have little to no effect on these factors. There is accordingly no merit to the coal industry's claims that a stay is needed to alleviate, or would effectively alleviate, any irreparable harm to their economic interests. Looking beyond the stay period, it is also too early to say how individual coal companies will perform under the Plan, because there are so many other factors in play, and emissions limits under the Plan do not even begin taking effect until 2022.

[2] My declaration focuses on financial trends in the coal-mining industry and associated market forces. My colleague David Schlissel's concurrently submitted declaration, which I cross-reference at Part A, provides more detail on associated trends for utilities that burn coal to generate electricity and on some of the general market factors that affect both coal-mining companies and coal-dependent utilities.

6. At Part B, I respond to some declarants' suggestions that the Plan has caused them economic harm because they must continue to make day-to-day business decisions without knowing whether the Plan will ultimately be upheld, or exactly how it will be implemented in individual states. A stay will not answer either of those questions, so it will not alleviate the complained-of uncertainty. Having to make business decisions without being certain about their long-term financial consequences is inherent in running a capital-intensive business with long investment horizons, in a dynamic and complex marketplace. This is not a new challenge for coal-mining companies and utilities, or one that a stay can alleviate.

Opinions

A. The weak financial performance of the U.S. coal industry is attributable to many factors that existed before EPA issued the Clean Power Plan and that will continue to drive industry performance, whether or not the Plan is stayed while the Court reviews it.

1. Domestic coal producers have faced declining demand and low prices for the better part of a decade. These trends are expected to continue.

7. U.S. coal producers are undergoing a fundamental transition. After thirty years of growth, the industry is now shrinking. The trend of declining demand and lower prices for coal began in the late 2000s and will continue for the foreseeable future.

8. The industry's financial distress is largely caused by the decline in domestic demand for coal for electricity generation. The United States used more than one

billion tons of coal per year from 2005-2008.[3] By 2014, coal usage had dropped to 854 million tons. The Energy Information Administration recently estimated that usage in 2015 will be 773 million tons,[4] a 26% reduction over the past decade.

9. The capital markets are accordingly moving away from coal and toward alternative fuels. This trend has also been underway for the better part of a decade.

2. The decline in the coal industry is attributable to many factors, including price competition with alternative fuels, weak international markets, increased production costs, excessive debt, and public health and environmental concerns. All of these factors influence companies' financial performance and access to capital.

10. The factors that influence the day-to-day financial performance of U.S. coal producers and utilities include low prices for natural gas (a competing fuel), increased reliance on wind, solar, and energy efficiency to meet electricity demand, weak international markets, increased production costs and excessive debt within the coal industry, and health and environmental concerns that have shaped and will continue to shape the regulatory environment for companies that extract and burn fossil fuels. All of these factors influence the performance of coal producers and utility companies, and (by extension) investor confidence in these companies and the companies' access to capital on the stock market and through borrowing. The following sections provide additional context on each factor.

[3] Electric Power Monthly, Table 2.1.A. Coal: Consumption for Electricity Generation, by Sector, 2005-August 2015, U.S. Energy Information Administration (Oct. 27, 2015), http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_2_01_a.
[4] Short-Term Energy Outlook, Custom Table Builder, U.S Energy Information Administration (Nov. 10, 2015), http://www.eia.gov/forecasts/steo/query/.

a. Low natural gas prices

11. Natural gas prices have been low, relative to coal prices, since the late 2000s. I expect natural gas prices to remain low through 2022, well past the possible stay period and into the first year in which utilities would be subject to carbon emissions limits under the Clean Power Plan. Part A of my colleague David Schlissel's concurrently submitted declaration includes a chart illustrating these historical and projected price trends and further discussion of this issue.

12. Current, low natural gas prices determine the price of power on the utility market and mean that, on a day-to-day basis, utilities and power grids are relatively more likely to turn to natural gas than coal. As my colleague David Schlissel explains at Part C of his concurrently submitted declaration, as a result of low natural gas prices and increasing competition from renewables (a factor noted below and discussed in more depth at Part B of Mr. Schlissel's declaration), the proportion of U.S. electricity generation has been declining and is expected to continue declining.

13. Coal prices in Central Appalachia, a region that once led the nation as the largest coal producer, cannot compete against natural gas in this market.[5] While Powder River Basin and Illinois Basin coal remain competitive on paper, the long-term trend of low natural gas prices threatens to further erode coal's share of the electrical generation market in all regions.[6] An exhaustive 2015 study of each energy region in the United States by SNL Energy, an independent analyst, concluded that

[5] Andrew Gelbaugh and Jesse Gilbert, *Generation Investment in RTO Markets – The Challenge and the Opportunity*, SNL Energy (May 2015), available through http://center.snl.com/Resources/Whitepaper.aspx?id=4294974142.

[6] Everett Wheeler, *OTC Market: Coal prices weaken amid worsening domestic, global outlook,* SNL (Nov. 13, 2015), https://www.snl.com/InteractiveX/Article.aspx?id=34508963.

"The nation's power markets continue to experience transitional pains along the path toward an electricity sector increasingly built upon natural gas and renewables. Natural gas prices have continued to fall and look to remain depressed for the foreseeable future, opening new opportunities for expansion of gas generation but potentially stranding legacy investments in coal and nuclear fleets."[7]

14. So long as domestic natural gas prices remain low, the coal industry will continue to lose market share, investor confidence in coal will remain low, and investments in coal production or generation will be worth less than they otherwise would. A stay of the Clean Power Plan, for the time period it takes this Court to review the Plan, should not have any significant effect on natural gas prices in that time period.

b. Competition from renewables and energy efficiency as alternative means of meeting electricity demand

15. Like natural gas, renewable energy sources have been gaining market share and becoming more attractive to investors due to technological advances, declining costs, and other factors. This is another long-term trend that has affected and will continue to affect the financial performance of coal producers. My colleague David Schlissel has included a detailed discussion of this issue at Parts B and C of his concurrently submitted declaration.

16. The declining cost of renewable power makes it easier for renewable power companies to compete against new or existing coal-fired power generators for a greater share of the electricity market. This, in turn, contributes to loss of market

[7] *Supra* note 5. *See also* Everett Wheeler, *Coal generators squeezed by falling natural gas prices*, SNL (July 2, 2015), https://www.snl.com/Interactivex/article.aspx?CdId=A-33141284-12851.

share for coal producers. I would not expect a stay of the Clean Power Plan, pending this Court's review, to have any significant effect on the relative prices of coal and renewable power generation in that time period.

c. Weak export markets

17. The financial performance of U.S. coal producers who have invested in exporting coal is also sensitive to trends in international coal markets. These trends are largely negative for the coal industry and expected to remain so.

18. Coal prices in every major region of the global market have declined recently and are expected to remain low or continue declining. Prices on the global seaborne thermal coal market have collapsed and are not expected to rise to sustainable levels for the foreseeable future. Several coal export terminal projects were cancelled in 2013.[8] IEEFA has concluded that China's demand for imported coal peaked in 2013 at 264 million tons—representing 26% of the global market—and is expected to decline to 173 million tons in 2015.[9] Other major regions in the global marketplace are also in decline. India's demand for imported coal has risen, but is also expected to decline due to increasing domestic production and government policies, as explained below.

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[8] *See* Jessica Goad, *Another Coal Export Terminal Is Terminated As Chinese Developments Could End Business Case For Remaining Three*, Climate Progress (May 9, 2013), http://thinkprogress.org/climate/2013/05/09/1989031/another-coal-export-terminal-is-abandoned-as-new-developments-in-china-could-eliminate-business-case-for-remaining-three/; Kiley Kroh, *The Declining Value Of Coal Just Killed Another Export Terminal*, Climate Progress (Aug. 20, 2013), http://thinkprogress.org/climate/2013/08/20/2494131/another-coal-export-terminal-canceled/.

[9] Tim Buckley and Tom Sanzillo, *Past Peak Coal in China*, Institute for Energy Economics and Financial Analysis, Nov. 2015, http://ieefa.org/wp-content/uploads/2015/11/IEEFA_Peak-Coal_November-2015.pdf.

19. Other analysts have concluded that the export market for U.S. coal is under severe stress and is likely to remain so for the foreseeable future.[10] Most financial analysts now seem to agree that as China reduces coal imports, existing Pacific Rim coal producers (Australia, South Africa, Indonesia, and Russia) have sufficient capacity to meet the needs of the remaining import countries, including India. I expect that U.S. coal producers will continue to fill a niche export market, but one not much larger than what exists today, for the reasons discussed below.

20. In June 2014, J.P. Morgan forecast a decline of U.S. thermal coal exports from 49 million tons per annum (mtpa) to 36 mtpa through 2016, and concluded that "[i]t's not economic to export US coal at present" and that prospects for new sales were limited.[11] In February 2015, Wood Mackenzie, a coal-industry analyst, projected that the global thermal market will stay in a condition of oversupply through approximately 2021, depending on how many new mine projects are actually delayed.[12] And in April 2015, two of China's leading coal producers announced plans to resume coal exports from China.[13]

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[10] *See, e.g.*, John Bridges, et al., *Global Coal Update*, J.P. Morgan, June 2014, http://pg.jrj.com.cn/acc/Res/CN_RES/INDUS/2014/6/29/37603388-1ecd-419e-8cbd-bd7d51fc5902.pdf, p. 1 ("Oversupply of Chinese thermal coal has depressed imports."); *Asian Coal and Power: Less, Less, Less…The Beginning of the End of Coal*, Bernstein Research, June 2013, Cover and *Executive Summary* (noting that Chinese market was the primary driver of new coal-mining investment over the last decade, and that once Chinese demand started to fall, the global thermal coal market would not recover).

[11] *Supra* note 10 (J.P. Morgan), p. 3.

[12] Rohan Somwanshi, *Analyst: Sporadic coal mine closures to not enough to rebalance oversupplied market,* SNL (Feb. 17, 2015), https://www.snl.com/InteractiveX/Article.aspx?id=31136996.

[13] *China's Shenhua, Datong Group Aim to Reverse Slide in Coal Exports*, Platts (Apr. 15, 2015), http://www.platts.com/latest-news/coal/beijing/chinas-shenhua-datong-group-aim-to-reverse-slide-26065883.

21. Coal markets are oversupplied in every region of the world that has an active coal market. Although India is still importing significant amounts of coal—upward of 200 mtpa—the government has said it hopes to drastically reduce, if not end, thermal coal imports.[14]

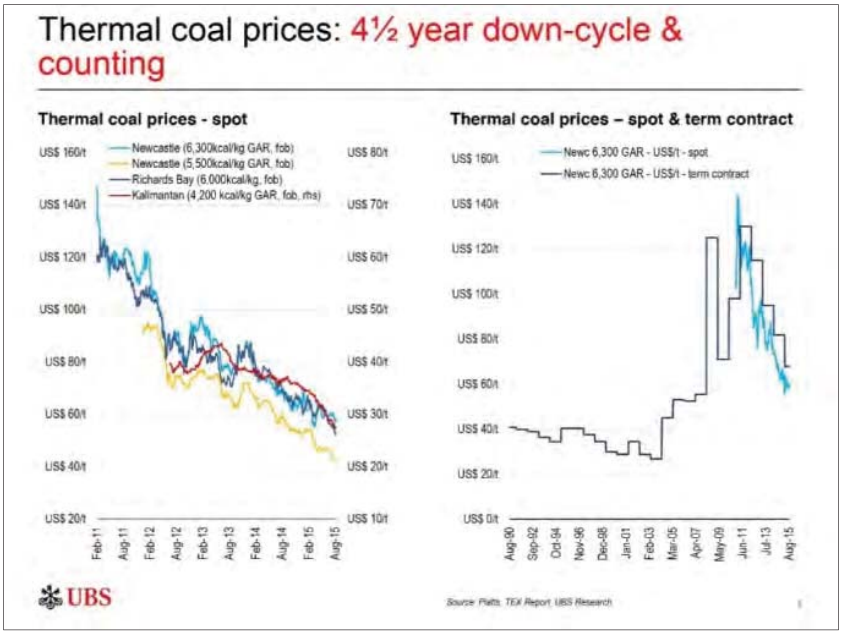
22. U.S. coal exports and export prices are already in decline. In 2012, U.S. coal producer exports peaked at 125 million tons of coal. In September 2015, the Energy Information Administration estimated that U.S. coal exports will drop to 79.5 million tons in 2015 and 72.3 million tons in 2016.[15] The market price for global thermal coal—the price that applies to coal shipped from the United States—has plummeted. A September 2015 price chart from UBS, reproduced below, shows that prices on the global spot market for Newcastle coal have dropped from a high of $140 per ton in 2011 to $30 per ton in August 2015:[16]

[14] Rajesh Kumar Singh, *Coal Revival Seen Fading as India's Rising Output Trims Imports*, Bloomberg Business (Aug. 12, 2015), http://www.bloomberg.com/news/articles/2015-08-12/coal-revival-seen-fading-as-india-s-rising-output-trims-imports.

[15] Everett Wheeler, *U.S. government chops coal export outlook*, SNL (Sept. 9, 2015), https://www.snl.com/InteractiveX/Article.aspx?id=33808886.

[16] Lachian Shaw, *Thermal Coal Markets: Opportunity for Japan?*, UBS, Sept. 2015, http://ieefa.org/wp-content/uploads/2015/09/UBS-report-Japan-et-al.pdf, p. 3. Newcastle coal is typically the benchmark used for the global price of coal and refers to coal mined in Australia.

Thermal coal prices



23. At current price levels, exports of U.S.-produced coal are unprofitable. In 2010, Peabody Energy,[17] one of the companies that has requested a stay of the Clean Power Plan, advised its investors that it required $90 per ton on the global market to profit from U.S. coal shipped through West Coast ports. At the time, Peabody appeared confident that this price target was achievable as a permanent, long-term goal. In 2014, Cloud Peak Energy, whose CEO Colin Marshall submitted a declaration in support of the National Mining Association's stay motion, stated it would require a market price of between $80 and $90 per ton for exports to be profitable.[18] As the UBS chart above illustrates, export prices have now dipped far below those levels, to

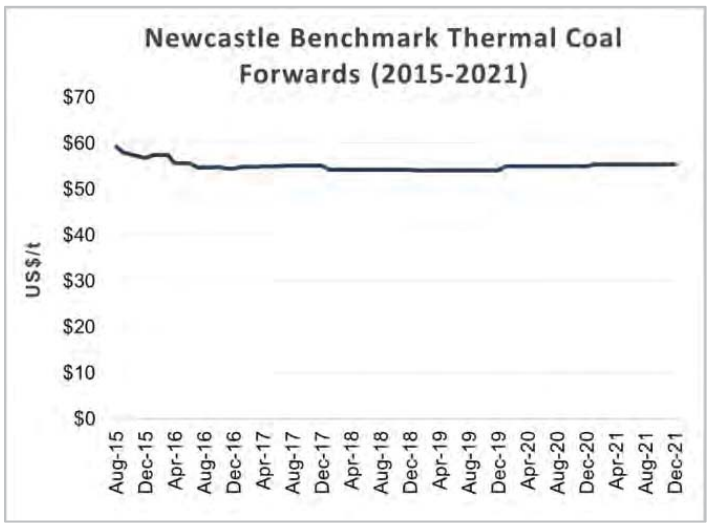
[17] Peter Gartrell and John Miller, *Peabody projections show lucrative Chinese market for PRB coal*, Platts Coal Trader (Dec. 6, 2010), http://archive.wusa9.com/news/article/124286/0/Peabody-projections-show-lucrative-Chinese-market-for-PRB-coal.

[18] *Cloud Peak Energy's CEO Discusses Q1 2014 Results - Earnings Call Transcript*, Seeking Alpha (Apr. 30, 2014), http://seekingalpha.com/article/2175763-cloud-peak-energys-ceo-discusses-q1-2014-results-earnings-call-transcript?part=single.

under $60 per ton. Cloud Peak, formerly the principal West Coast exporter of coal to China and other Asian countries, recently halted its export operations.[19]

24. I expect low coal-export prices to persist. The import trends for China and India suggest a continued slowdown in the global thermal seaborne coal trade. Both countries have internal reasons for adopting policies that reduce or eliminate the level of imported coal into their countries. Future price forecasts are in the high $50-per-ton range through December 2021 (again, well below the breakeven price levels earlier forecast by Peabody and Cloud Peak). This weak pricing is causing coal companies around the world to cut spending and cancel projects.[20]

Newcastle Benchmark Thermal Coal Futures Coal Prices[21]



25. The financial challenges that domestic coal producers are facing on the international market have little to do with the Clean Power Plan, and I would not

[19] Jeff Nagel, *Fewer coal trains as U.S. firm halts exports*, The Now (Oct. 31, 2015), http://www.thenownewspaper.com/news/339131941.html.
[20] *Supra* note 16, p. 8.
[21] ICE NewCastle Coal Futures Prices, Barchart, http://www.barchart.com/commodityfutures/ICE_NewCastle_Coal_Futures/LQ (last visited Nov. 30, 2015).

expect a stay to have any meaningful effect on those challenges. For example, I have no reason to expect that a stay will cause China and India to increase short-term coal imports, or abate competition from other countries that supply the global market. The decline in export markets is not attributable to the Plan, and will persist and hamper the financial performance of U.S. coal companies whether or not a stay is granted.

d. Increasing coal production costs

26. Increasing production costs in the coal industry have also contributed to and will continue to contribute to a decline in producers' financial performance. Since 2004, average production costs for Central Appalachian coal have increased approximately 116%.[22] Average production costs in the Powder River Basin, the other major domestic coal-producing region, have increased 5% to 8% annually.[23] In both regions, the trend in average production costs reflects the fact that the coal companies have generally already mined the most accessible (and thus cheapest to extract) coal, and have had to move on to coal that is costlier to mine and bring to market. I accordingly expect average production costs to increase with or without the Clean Power Plan, and would not expect a stay of the Plan to have any meaningful effect on this trend, during the time it takes this Court to review the Plan.

e. High debt levels caused by past investment decisions

27. Yet another long-term factor that affects the financial performance of the coal industry is the effect of past investment decisions and associated debt. Between 2004

[22] *Changes Underway in the Central Appalachian Coal Industry*, Patriot Coal (July 14, 2014), http://www.thecoalinstitute.org/ckfinder/userfiles/files/Present%20State%20of%20the%20CAPP%20Coal%20Industry%20-%20Ben%20Hatfield%20-%20Patriot%20Coal(1).pdf, Slide 21.

[23] *Cloud Peak Energy (CLD) Colin Marshall on Q3 2015 Results - Earnings Call Transcript*, Seeking Alpha (Oct. 28, 2015), http://seekingalpha.com/article/3611726-cloud-peak-energy-cld-colin-marshall-on-q3-2015-results-earnings-call-transcript.

and 2013, for example, the net debt of all U.S. coal companies increased from $3 billion to $20 billion.[24] Jefferies, a coal-mining industry analyst, has identified a wave of mergers and acquisitions in 2011 as a major factor in the industry's poor financial performance in the subsequent years.[25] For example, stay movant and movant-intervenor Peabody Energy significantly increased its debt through a $4.9 billion 2011 acquisition that a 2015 financial analysis concludes has "yet to produce results."[26]

28. Like many commodity markets, the market for coal has historically included periods in which prices spike. Producers use those periods to improve their cash positions, fund new purchases, and pay off existing debt. The trends in natural gas and renewable-energy prices I discussed earlier suggest that coal companies are unlikely to experience and be able to capitalize on similar price spikes in the future. This makes coal-company debt levels appear less sustainable to prospective investors, and helps explain the loss of investor confidence and stock-price and bond-rating trends I discuss at Part A.2.a, below.[27]

29. Like the other factors discussed above, coal-company debt levels are part of a longer-term trend that predates EPA's issuance of the Clean Power Plan and will continue to affect the industry in the coming years. I would not expect a stay of the

[24] Everett Wheeler, *Cash strapped coal companies seek relief through coal sales*, SNL (Dec. 13, 2013), https://www.snl.com/interactivex/article.aspx?id=26264761&KPLT=6.
[25] Darren Epps, *After met coal market collapse, an uncertain future for the coal industry*, SNL (Mar. 27, 2014), https://www.snl.com/InteractiveX/Article.aspx?id=27556596 (quoting Jefferies analyst).
[26] *See From hero to zero: Peabody Energy Corp.*, Case Study Competition 2015, The Economist, http://www.economist.com/sites/default/files/case_resolution_fictconsulting.pdf (last visited Nov. 30, 2015), at 16.
[27] *Fitch: Higher Default Rates Expected For US Coal Sector*, Fitch Ratings (Oct. 15, 2015), https://www.fitchratings.com/site/fitch-home/pressrelease?id=992355.

Plan to significantly affect this trend during the time it takes this Court to review the Plan.

f. Health and environmental concerns and associated regulatory and political pressures on fossil-fuel producers and generators

30. The performance of coal producers and utilities that run coal-fired power plants is also unavoidably sensitive to public concerns about the impacts of mining and burning fossil fuels on public health, welfare, and the environment. These concerns underlie the Clean Power Plan, but also many other regulatory developments, at the state, national, and international levels. These include state-level renewable portfolio standards (which encourage the use of renewable sources of electricity generation), state and international efforts to regulate carbon emissions from the energy sector, and state and national regulation of conventional pollution (including particulate matter, sulfur dioxide, nitrogen oxide, and toxic metal pollution) released from coal-fired power plants and coal mines. They also include efforts to improve safety and working conditions for coal miners.

31. The Clean Power Plan is thus part of a far broader and longer-term trend towards tighter health and environmental regulation that I would not expect a stay to reverse, and whose long-term financial implications for individual coal companies are hard to predict. I return to this last point at Part B.

2. The Clean Power Plan is a relatively minor factor in the financial performance of the domestic coal industry. A stay of the Plan will not reverse or substantially change current negative trends (including in access to credit) in the industry.

32. In my opinion, given the broader market dynamics discussed above, the Clean Power Plan is at most a marginal factor influencing the financial performance of the coal industry. Although implementation of the Plan's emissions limits (if the Plan is upheld) may in the long run accelerate and intensify some of these trends, none of these trends will be reversed or change substantially during the prospective stay period if the Plan is stayed.

33. The relative insignificance of the Plan and of any short-term stay thereof to coal-industry performance is easier to understand once one puts some of the stay declarants' claims in a broader timeframe, and considers other public statements some stay declarants' companies have made to investors since EPA issued the Plan.

a. Trends in coal-company stock prices, bond ratings, and general access to capital

34. Several declarants have suggested that recent trends in stock prices and bond ratings for coal producers show that a stay of the Clean Power Plan is necessary to avert or could help to avert serious contractions in those companies' access to capital on the stock and bond markets. I disagree.

35. With respect to stock-price movements like those discussed by Bryan Galli (for Peabody Energy) and Seth Schwartz (for the National Mining Association and others), it is important to understand both that the stock values for every major coal company have collapsed over five or more years and that there are many short-term fluctuations in those prices. Coal stocks have declined 89% over the last five years, a

period in which the value of the Standard & Poor's 500 (a major stock index) increased 84%.[28] Cloud Peak Energy's stock price declined roughly 85% during that period, and Peabody Energy's stock price declined roughly 98%:[29]

Peabody Energy Stock Performance



36. Peabody's stock price has been in a declining trend since at least 2011, well before EPA issued its proposed Clean Power Plan regulations. Bryan Galli notes that Peabody's stock dropped $90 million on the day the final Plan was announced and strongly suggests the drop was attributable to the Plan, but he also acknowledges in a footnote that the stock rebounded within days.[30] There are similar patterns

[28] Peabody Energy Corporation, Stock Chart, SNL, https://www.snl.com/InteractiveX/BriefingBookGraph.aspx?ID=4065857&GraphType=1 (last visited Nov. 30, 2015).
[29] Peabody Energy Market Cap, YCharts, https://ycharts.com/companies/BTU/market_cap (last visited Nov. 30, 2015).
[30] Galli Decl ¶ 30 & n.13.

surrounding past climate initiatives, and they underscore the perils of over-generalizing from short-term stock-price fluctuations.[31]

37. After EPA published the final Clean Power Plan, BlackRock Investment Institute issued a report that opined on past and current climate initiatives and their impacts on company valuations. BlackRock questioned the premise that carbon regulation has affected valuations, saying it found "little evidence that assets more susceptible to climate change and related regulatory risks trade at a discount to the market."[32]

38. The long-term decline in coal-industry stock prices is driven primarily by investor judgments about how coal companies will perform in light of market factors like those described earlier in this declaration. Stock-price trends for individual companies may, of course, also reflect company-specific developments, such as new acquisitions. The dramatic long-term decline in coal stock prices was not caused by the Clean Power Plan, and I would not expect a stay of the Plan to reverse this trend.

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[31] For example, in July 2010, when a climate bill being considered by Congress was defeated in the Senate, Peabody's stock price briefly moved upward, from $43.75 on July 21 to $45.23 per share on July 23. But by July 31, it had returned to $44.00. *See* Peabody Energy Corp., Historical Prices, Yahoo! Finance, http://finance.yahoo.com/q/hp?s=BTU&a=06&b=1&c=2010&d=08&e=30&f=2010&g=d (last visited Nov. 30, 2015).

[32] BlackRock Investment Institute, *The Price of Climate Change: Global Warming's Impact on Portfolios*, Oct. 2015, https://www.blackrock.com/corporate/en-mx/literature/whitepaper/bii-pricing-climate-risk-international.pdf, p. 6. BlackRock Investment Institute is part of BlackRock, Inc. The Institute's purpose is to provide investment insights and analysis for BlackRock's team of professionals who serve BlackRock's clients. BlackRock funds hold over 900,000 shares of Peabody and over 5 million shares of Cloud Peak. *See* SNL, Cloud Peak and Peabody Energy corporate profile, Institutional Ownership Information. SNL's database is made available to IEEFA under a proprietary agreement. The information on Cloud Peak and Peabody is available upon request.

39. Coal-company bond ratings likewise reflect long-term, negative trends in the coal market. In an August 2015 report, Moody's predicted that the final Plan's impact on coal producers' near-term access to credit "will be marginal because demand for coal has already been in a steep decline owing to stiff competition from low natural gas prices over the past few years," and that the Plan generally "will have a minimal incremental impact in the short run."[33] Although Moody's mentioned the Plan in its most recent bond-rating opinion for Murray Energy, one of the stay movants and Plan challengers, it also referenced other factors including low natural gas costs, weak export markets, high production costs, earlier environmental regulations, and labor concerns.[34]

b. Coal-producer investor statements since the Plan was issued

40. Another way to put the coal-industry declarants' claims about the Clean Power Plan in context is to consider how publicly traded coal producers have characterized the main factors that affect their financial performance in the months since EPA issued the final Plan. For example, in an October 27, 2015, statement on its release of third-quarter earnings, Cloud Peak Energy CEO and stay declarant Colin Marshall identified natural gas prices and weather as "the largest factors impacting coal demand," before going on to discuss "ongoing" regulation and other factors including competition for renewables and a "very weak" international thermal coal market.[35]

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[33] Moody's Investors Service, *EPA Carbon Rule Hurts Coal, Boosts Renewables* (Aug. 12, 2015), pp. 2, 4.
[34] Moody's Investors Service, *Credit Opinion: Murray Energy Corporation* (Sept. 28, 2015).
[35] Press Release, *Cloud Peak Energy Inc. Announces Results for the Third Quarter and the First Nine Months of 2015* (Oct. 27, 2015), http://investor.cloudpeakenergy.com/press-release/earnings/cloud-peak-energy-inc-announces-results-third-quarter-and-first-nine-months-5. In its October 28, 2015, quarterly report, filed after Mr. Marshall's declaration in this case, the company said it expected the Plan to diminish the coal market, but was "not in a position to make any meaningful determination

41. Looking well beyond the prospective stay period, to put the declarants' statements in an even broader context, it is important to note that by 2022, when the carbon emissions limits included in the Plan are scheduled to start taking effect, the U.S. will remain a leading coal-production market.[36]

B. Making business decisions in the face of uncertainty is an inescapable part of running a capital-intensive business with long-investment horizons in a complex market. The Clean Power Plan is only one of many sources of uncertainty for coal-mining companies and utilities that are invested in coal-fired generation. A stay would not remove uncertainty attributable to the Plan, and might deepen it.

42. As I explained in Part A.1, there are many significant market factors that influence the financial health of the coal industry, that predate the Clean Power Plan and that will persist whether or not the Plan is stayed (or ultimately upheld and implemented).

43. Some declarants suggest that the Plan has further complicated short-term decisions about how to run their businesses, because they must continue to make investment and other day-to-day decisions without knowing whether the Plan will be upheld, or how it will be implemented in individual states.[37] But even if the Court were to issue a stay, the stay would not answer those questions. Thus, even if one assumes for the sake of argument that EPA's issuance of the Plan is a significant

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about the extent of the [Plan's] impacts to [its] operations." Cloud Peak, *SEC Form 10-Q for the period ending September 30, 2015*, p. 43.

[36] For example, EPA estimates a domestic coal market for generation by 2025 of between 606 and 625 million tons per year. U.S. Environmental Protection Agency, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, Table 3-15 Coal Production for the Electric Power Sector, p. 3-33, Oct. 23, 2015, http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf. At this level the United States will remain the world's second or third largest coal market.

[37] *See, e.g.*, Frenzel Decl ¶ 29.

source of short-term uncertainty in the coal market, relative to all of the other market factors discussed in this declaration, a stay would not remove that uncertainty.

44. Some declarants in support of stay motions seem to acknowledge that to the extent that EPA's issuance of the Plan has been a source of uncertainty for their businesses, a stay alone cannot remove uncertainty and therefore will have little to no practical effect on their financial performance and prospects. For example, in his declaration, Cloud Peak Energy CEO Colin Marshall compares the business decisions he expects the company will make if the Plan "is not stayed" with those it will make if the Plan "is withdrawn or vacated" (*e.g.*, not simply stayed).[38] Only if the regulation is vacated and a substantially similar rule was not likely to replace it does Cloud Peak see a clear path to future investment.

45. If anything, it seems that a stay would *deepen* the kind of uncertainty concerning how the Plan will be implemented that some declarants complain of—for example, by encouraging certain states to defer work on their state-specific implementation plans.

Conclusion

46. For the reasons stated above, a stay of the Clean Power Plan would not ameliorate any serious economic harm the coal industry may otherwise suffer in the period it will take the Court to consider the merits of the Plan. The industry's financial problems are deep, long in the making, driven by factors that predate the Plan, and part of a broader market transformation. To the extent that the industry is harmed because it must make short-term investment and other business decisions in an

[38] Marshall Decl ¶¶ 20-21.

uncertain economic environment, that kind of economic uncertainty is traceable to many market factors, and a stay of the Plan would not meaningfully reduce it, and could deepen it.

I swear under penalty of perjury that the foregoing is true and correct.

Tom Sanzillo

Dated December 1, 2015

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF DAVID SCHLISSEL

INSTITUTE FOR ENERGY ECONOMICS AND FINANCIAL ANALYSIS

Introduction and Qualifications

I, David Schlissel, declare:

1. I am Director of Resource Planning Analysis for the Institute for Energy Economics and Financial Analysis ("IEEFA").[1] I conduct research on a range of fossil fuel and renewable resource issues including coal-fired electric generating unit ("EGU") costs and operating performance and the relative costs of natural gas and renewable alternatives.

2. Prior to joining IEEFA, I worked for four decades as a consultant and attorney on complex management, engineering, and economic issues, primarily in the field of energy. My clients included state regulatory commissions, state attorneys general, several states, state consumer advocates, cities, power plant suppliers, an independent power producer, and consumer and environmental organizations. I have researched coal, energy, and environmental issues in more than 30 states and several foreign nations and have published numerous reports on the factors that have influenced the economic and financial viability of proposed and existing fossil fuel-fired power plants and renewable alternatives. I also have testified as an expert witness in more than 165 proceedings before 35 state public utility commissions, before the Federal Energy Regulatory Commission ("FERC") and the U.S. Nuclear Regulatory Commission, and in state and federal court litigation.

[1] My bio is included as an attachment to this declaration.

3. I hold undergraduate and advanced engineering degrees from the Massachusetts Institute of Technology and Stanford University, respectively, and a law degree from Stanford Law School.

4. This declaration is based on my education, experience, and review of materials I gathered, in addition to those submitted by petitioners or provided to me by counsel.

Summary of Opinions

5. Due to a number of circumstances completely independent of the Clean Power Plan, many thousands of megawatts ("MW") of existing coal-fired EGUs in the U.S. have come under substantial economic and financial stress and have either retired, are scheduled to retire, or are at risk of retirement in the coming years. These circumstances include:

a. The collapse of natural gas prices in late 2008/early 2009 due to the large and growing supply of shale gas and a subsequent decline in the cost of generating power at natural gas-fired power plants;

b. Increased competition from renewable wind and solar resources, as the total MW of installed wind and solar capacity have soared in recent years due to steep declines in the installation prices for wind and solar photovoltaic ("PV") resources and support from federal and state programs;

c. Steep declines in the amount of power generated at many existing coal-fired EGUs as that generation has been displaced by less-

expensive power from natural gas-fired EGUs and, in recent years, power from renewable wind and solar resources;

d. Precipitous declines in energy market prices in the deregulated wholesale markets where many existing coal plants are located;

e. An aging coal fleet that can be expected to have higher operating and maintenance costs, continuing annual capital expenditures, and degrading operating performance as it ages;.

f. Rising coal plant operating and maintenance costs, including the need for additional capital expenditures ("capex") to replace existing equipment and components that have degraded due to age or service related wear-and-tear and for upgrades required to address environmental regulations other than the Clean Power Plan; and

g. Flat or relatively flat growth in electric usage driven by the Great Recession of 2008-09 and the increased deployment of energy efficiency and distributed, on-site renewable resources.

6. All of these circumstances are independent of the Clean Power Plan and all have combined to undercut the viability of continued operation of existing coal-fired plants and the profitability of the companies that own them. As natural gas prices have fallen, regional power market prices have declined precipitously and coal plant generation has dropped steeply. Consequently, revenues from coal-fired EGUs have decreased, investments in environmental plant upgrades have been called into question, and coal has lost a significant market share to natural gas and renewable resources.

7. As a result of these market forces and economic trends, a substantial amount of coal capacity was retired, announced for retirement, or targeted for conversion to gas between 2009 and March 2014 —before the Clean Power Plan was even proposed, let alone finalized. At that time, analysts anticipated that actual future retirements of coal-fired EGU capacity would exceed the retired and announced retirements that had occurred to date.

8. In my opinion, additional retirements of coal-fired EGUs can be expected in coming years, independent of the Clean Power Plan, as none of the market forces and trends listed above and discussed in this declaration can reasonably be expected to abate sufficiently, if at all, to support the continued operation of many existing coal-fired EGUs, including those listed in Exhibits 29 and 31 of the Declaration and Report of Seth Schwartz submitted in support of the National Mining Association's stay motion.

9. Furthermore, staying the Clean Power Plan will not make these coal-fired assets any more viable in either the near-term or the long-term. Even if the Court were to stay the rule during the pendency of this litigation, it would not guarantee—or even make it less likely—that power plants would not have to pay a price for their carbon pollution in 2022, either under the Clean Power Plan or other carbon regulations that may be enacted at the state or federal levels. In fact, a stay would inject *more* regulatory uncertainty into the process and thereby disrupt utilities' decision-making processes (*see* Sanzillo Decl. ¶¶ 42–45). For example, if an owner were to make a major capital investment at an aging plant on the basis of a stay, it

might find that investment to have been wasted two years down the road if the court ultimately upheld the rule, whereas the economically wiser choice would have been to await the final outcome of litigation before making the investment. There is therefore no basis to assert that staying the Clean Power Plan will facilitate plant owners' decision-making during the litigation period.

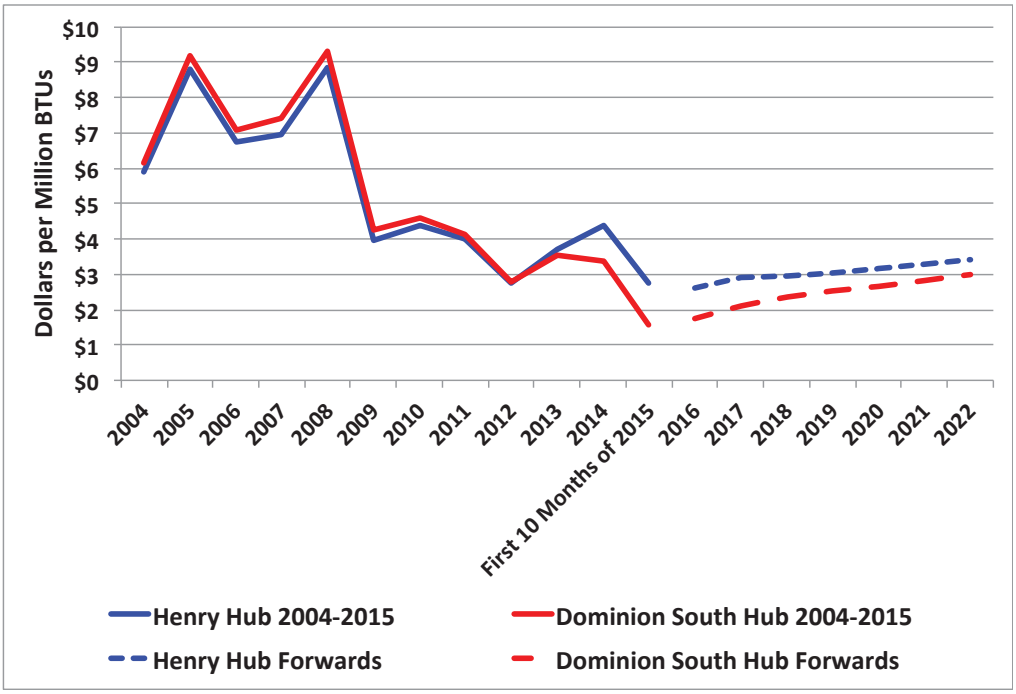
Opinions

A. Natural Gas Prices Have Declined Precipitously Beginning in Late 2008 and Early 2009.

10. The Henry Hub in Louisiana has traditionally been the most important pricing location for natural gas in the United States. However, in recent years, the Dominion South Hub in Southwest Pennsylvania has gained in importance due to the discovery and production of increasing amounts of natural gas from the Marcellus Shale in the Eastern United States.

11. Figure 1 below shows the historical annual prices for natural gas at the Henry Hub and Dominion South Hubs between the years of 2004 and the first ten months of 2015, as well as the forwards prices for the years 2016 through 2022. The sharp decline between gas prices in 2008 and 2009 is readily apparent.

Fig. 1: Natural Gas Prices at Henry Hub and Dominion South Hub[2]



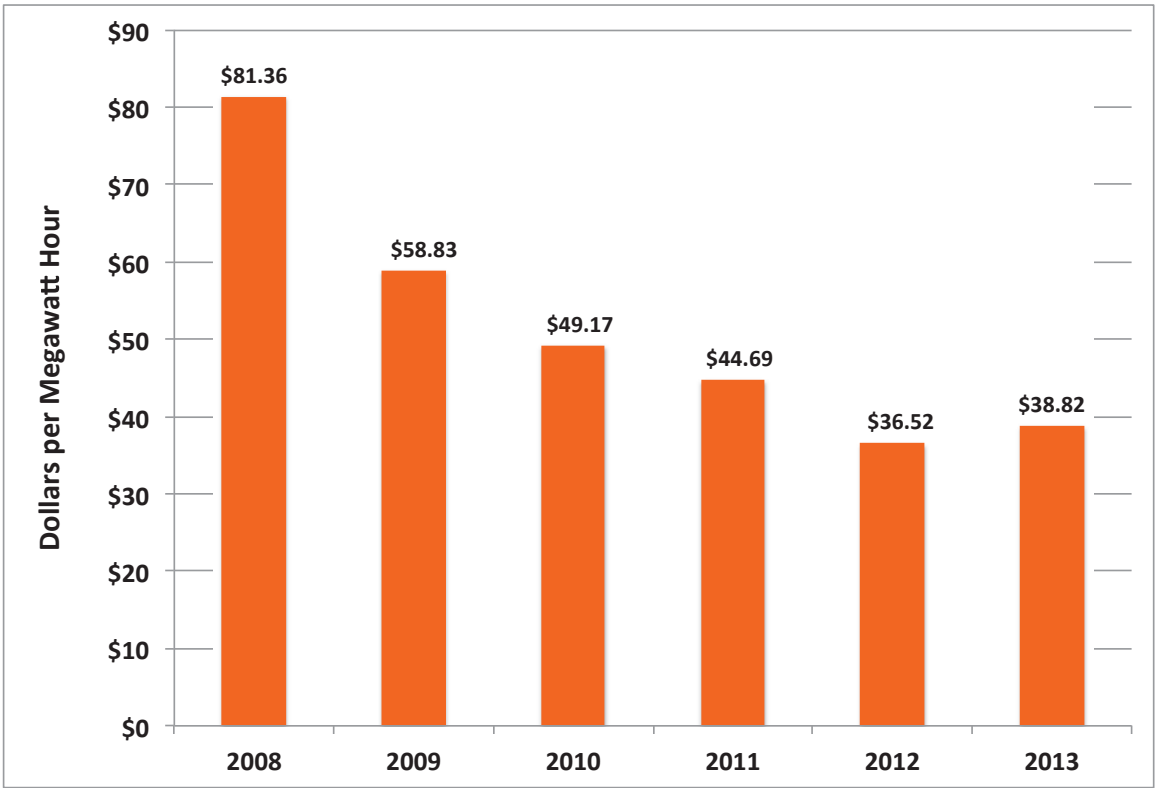
12. Although, as shown in Figure 1 above, gas prices rebounded somewhat in 2014, largely due to the Polar Vortex event in the first months of the year, they again declined quite significantly during 2015. As a result, gas prices have fallen at Henry Hub by 69 percent between 2008 and 2015 and at Dominion South Hub by 83 percent.[3]

13. This steep drop in natural gas prices has led to significant declines in the operating costs at gas-fired power plants, which has made them much more competitive against generation at coal-fired units. As an illustration of this, Figure 2 below shows the over 50 percent decline in the average cost of

[2] Data on historical natural gas prices derived from SNL Financial. Forward prices from OTC Global Holdings as of November 12, 2015, downloaded from SNL Financial.
[3] *Id.*

generating power at gas-fired combined cycle EGUs in Florida between the years 2008 and 2013.

Fig. 2: Average Cost of Generating Power at Natural Gas-Fired Combined Cycle Power Plants in Florida[4]



14. Most importantly, natural gas prices are not expected to rebound significantly at any time in the foreseeable future, as evidenced in the natural gas forwards prices shown in Figure 1 above. These forwards prices represent the prices at which gas can be purchased today for delivery months or years in the future. As such, they represent the market's outlook for future natural gas prices. At both Henry Hub and Dominion South Hub, gas

[4] Data derived from plant operating cost information published by SNL Financial.

forwards through 2022 sell at or below typical gas prices that the market has seen since the initial price plummet in 2008-09.

15. In addition to Henry Hub and Dominion South Hub, there are a number of other hubs (i.e., pricing locations) around the U.S. at which natural gas is sold and purchased. These hubs have experienced the same steep decline in energy market prices since 2008-09 and similarly expect that gas prices will remain low in the coming years. Fuel industry and financial community analysts also forecast very slow growth in natural gas prices over the next decade or so. For example, a Wood Mackenzie analyst has projected that the potential supply of natural gas and the ability of producers to turn profits at lower prices are likely to keep natural gas below $4 per million cubic foot for the foreseeable future.[5]

16. As a result, the prices of generating power at natural gas-fired EGUs are not expected to increase significantly in coming years. This development will maintain, and perhaps even enhance, natural gas's competitive advantage over coal for generating electricity. And it is entirely independent of the Clean Power Plan.

B. Coal-Fired EGUs Face Increased Competition from Renewable Wind and Solar Resources.

17. At the same time that natural gas prices have declined precipitously, there also has been a tremendous increase in the solar and wind capacity on

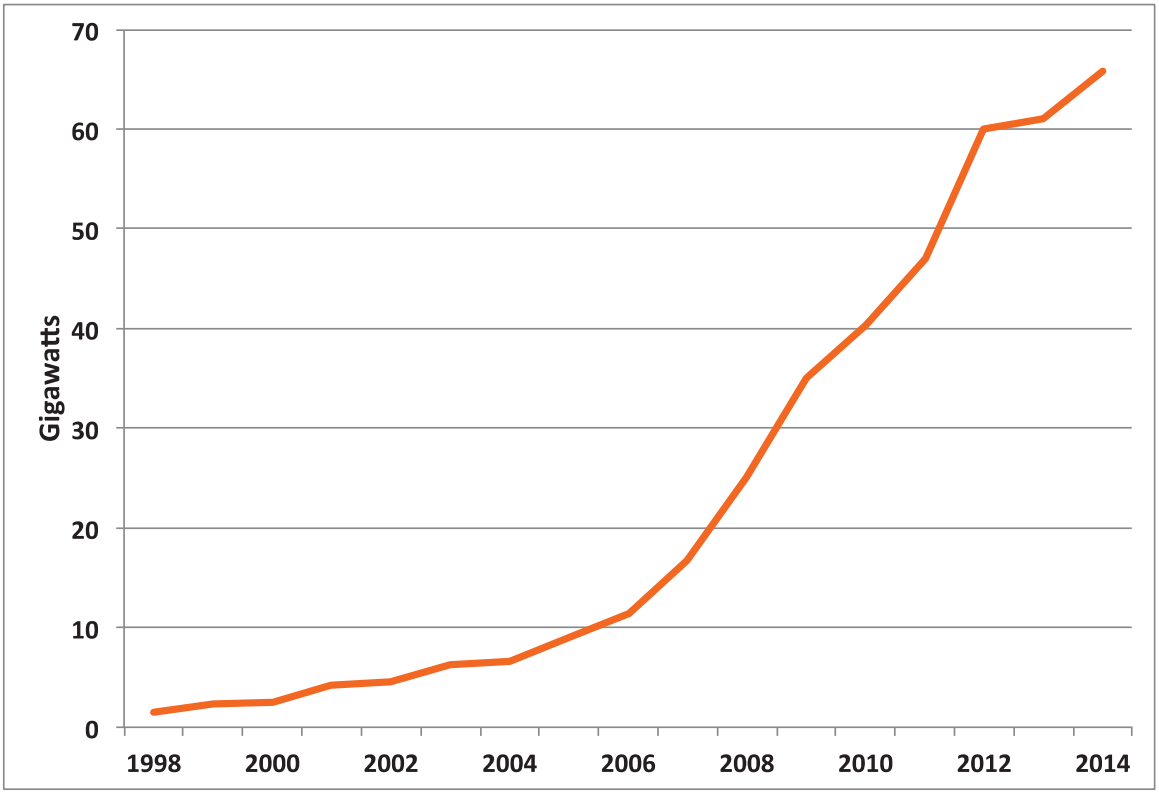
[5] 'Tough to get beyond $4': Wood Mackenzie analyst sees little gas-price upside, SNL Financial (May 20, 2015).

the electric grid, due in large part to steep declines in installation costs, as I will discuss below. The adoption of renewable portfolio standards ("RPS") in nearly 30 states, which typically require utilities to purchase a portion of their power from renewable resources, also has contributed to the increase in solar and wind capacity.

18. For example, as shown in Figures 3 and 4 below, as of the end of 2014, the U.S. had more than 69 GW of installed wind capacity and more than 18 GW of installed solar PV capacity. These numbers represent an addition of 54.6 GW of new wind capacity and 16.9 GW of new solar capacity just between 2007 and 2014. Together, wind and solar represented almost 43 percent of the nation's total generation capacity additions during this period.[6]

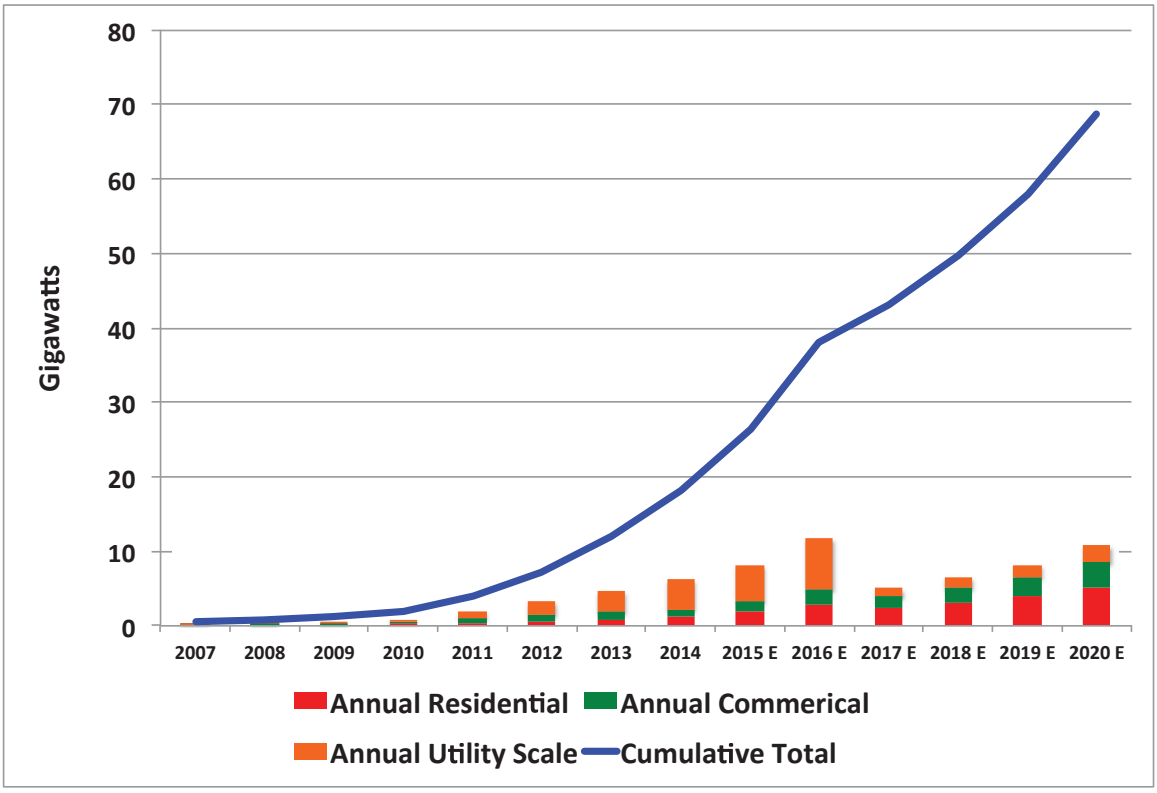
[6] Ryan Wiser, et al., U.S. Dep't of Energy, *2014 Wind Technologies Market Report* (Aug. 2015), at Fig. 2, *available at* http://www.energy.gov/sites/prod/files/2015/08/f25/2014-Wind-Technologies-Market-Report-8.7.pdf.

Fig. 3: Domestic U.S. Wind Capacity[7]



[7] *Id.* at Fig. 1.

Fig. 4: U.S. Installed Solar Photovoltaic Capacity[8]



19. Renewables resources' share of the market is likely to increase significantly in coming years, as another 50 GW of solar PV capacity are expected to be added by 2020[9] and more than 13 GW of new wind capacity are already under construction.[10] This will increase the economic and financial stress on coal plant owners even without the Clean Power Plan.

20. The energy generated by renewable resources (other than hydropower) more than doubled between 2007 and 2014, increasing from

[8] Mark Bolinger and Joachim Seel, Lawrence Berkeley Nat'l Laboratory, Utility-Scale Solar 2014: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States (Sept. 2015), at Fig. 1, available at https://emp.lbl.gov/publications/utility-scale-solar-2014.

[9] *Id.*

[10] American Wind Energy Ass'n, *U.S. Wind Industry Third Quarter 2015 Market Report, Executive Summary* (Oct. 22, 2015), at 9, *available at* http://www.awea.org/3q2015.

2.5 percent of the total U.S. electric generation to 6.8 percent.[11] Wind resources alone provided 11 percent of the energy in the ERCOT market in Texas in 2014,[12] as well as 8 percent of the energy in the MISO market in 2013 and 6 percent in 2014.[13]

21. This rapid growth in new wind and solar capacity and generation has been due to several factors, including declining installation rates, improved operational efficiencies, increased interest in carbon-free resources, and the adoption of renewable portfolio or renewable energy standards by a number of states.

22. For example, wind turbine prices have declined substantially in recent years despite increases in hub heights and larger rotor diameters.[14] All of the changes discussed above have combined with improved turbine technology to reduce project costs and wind power purchase agreements ("PPA") prices.[15] As a result, the prices for power from wind PPAs have dropped to all-time lows, declining from $70 per megawatt-hour ("MWh") for PPAs executed in 2009 to a nationwide average of around $23.50 per MWh for PPAs signed in 2014.[16] Despite uncertainty about the future of the federal

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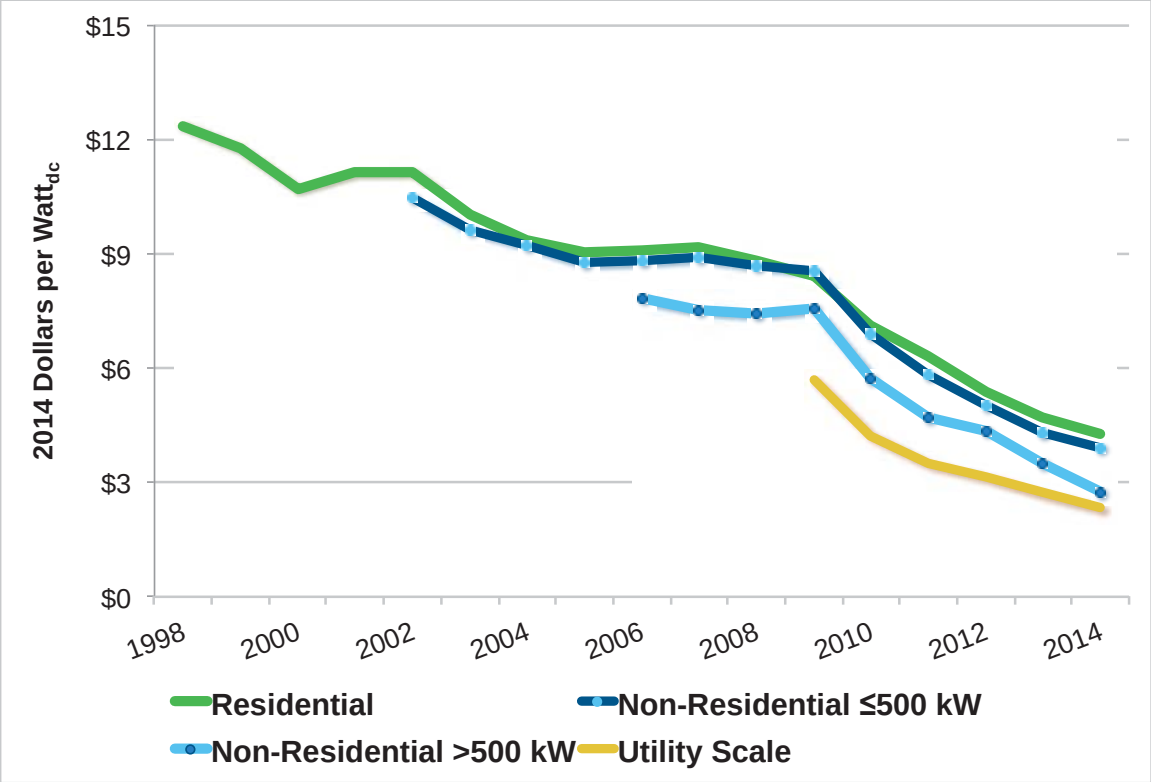
[11] EIA, *Short-Term Energy Outlook* (Nov. 2015), Fig. 25, *available at* http://www.eia.gov/forecasts/steo/xls/Fig25.xlsx.
[12] ERCOT, *2014 State of the Market Report* (July 2015), at xiv, *available at* https://www.potomaceconomics.com/uploads/ercot_documents/2014_ERCOT_State_of_the_Market_Report.pdf.
[13] MISO, *2014 State of the Market Report* (June 2015) at 5, *available at* https://www.misoenergy.org/Library/Repository/Report/IMM/2014%20State%20of%20the%20Market%20Report.pdf.
[14] Wiser, *supra* n. 6, at 29–31, 46–54.
[15] *Id.* at 56–60.
[16] *Id.* at 56.

wind Production Tax Credit, further decreases in wind prices can be expected in coming years that will put further pressure on coal generation.[17]

23. Installation prices for utility-scale solar projects and for distributed residential and commercial solar PV have also plummeted in recent years. As shown in Figure 5 below, distributed solar PV installation prices decreased by an average of 6 to 8 percent per year from 1998 through 2013, dropping an additional 9 percent from 2013 to 2014. Preliminary data suggest similar price declines in the first half of 2015. Median utility-scale solar PV installation prices have fallen by more than 50 percent between 2007-2009 and 2014.

[17] Christopher Martin and Justin Doom, *Wind Power Without U.S. Subsidy to Become Cheaper Than Gas*, Bloomberg Business (Mar. 12, 2015), *available* at http://www.bloomberg.com/news/articles/2015-03-12/wind-energy-without-subsidy-will-be-cheaper-than-gas-in-a-decade; *see also* U.S. Dep't of Energy, *WindVision: A New Era for Wind Power in the United States (Executive Summary)* (Mar. 2015), *available at* http://energy.gov/sites/prod/files/wv_executive_summary_overview_and_key_chapter_findings_final.pdf.

Fig. 5: Solar PV Installation Prices (Median Values) [18]



24. Solar installation prices are expected to continue to decline in coming years, with some analysts projecting prices as low as $1.50 to $3 per watt by 2016, with additional declines expected in later years.[19] By comparison, median prices as recently as 2009 averaged around $7.50 to $9 per watt, as seen in Figure 5 above.

[18] Galen L. Barbose, et al., Lawrence Berkeley Nat'l Laboratory, Tracking the Sun VIII: An Historical Summary of the Installed Price of Photovoltaics in the United States from 1998 to 2014 (Aug. 2015), at Fig. 7, available at https://emp.lbl.gov/publications/tracking-sun-viii-install.

[19] David Feldman, et al., Nat'l Renewable Energy Laboratory and the Lawrence Berkeley Nat'l Laboratory, *Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections, 2014 Edition* (Sept. 22, 2014), at slides 5 and 26-28, *available at* http://www.nrel.gov/docs/fy14osti/62558.pdf.

25. The prices for long-term PPAs from utility-scale solar PV projects have fallen so dramatically since 2009 that the median PPA price in the U.S. is now just below $50 per MWh, down from prices above $100 per MWh for PPAs signed as recently as 2010.[20]

26. These recent declines in wind and solar PPA prices, the underlying declines in wind and solar installation prices, and the competitive advantage they give renewable resources over coal-fired EGUs are completely independent of the Clean Power Plan.

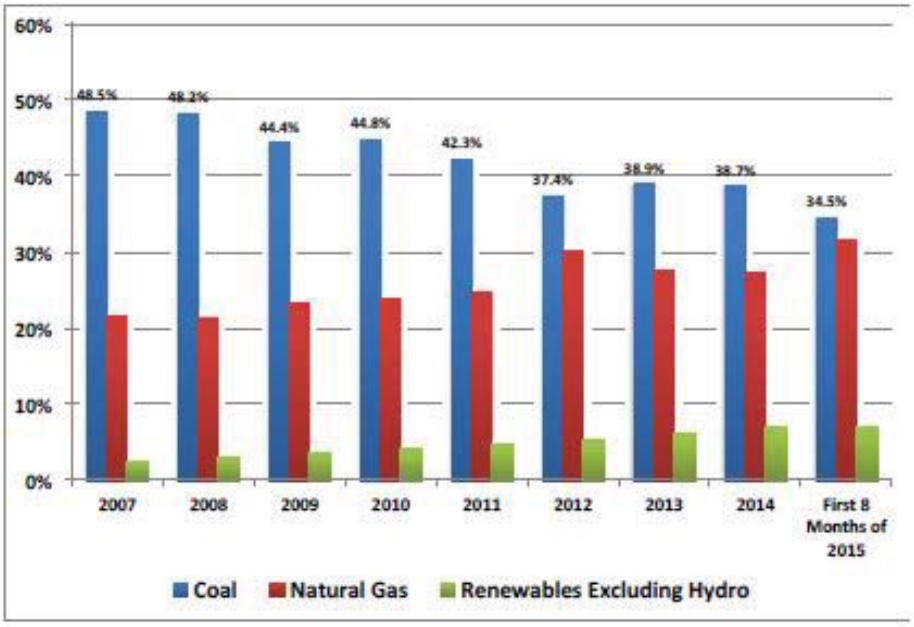
C. Generation at Coal-Fired EGUs Has Declined Steeply As a Result of Low Natural Gas Prices and the Addition of More Renewable Wind and Solar Capacity.

27. In recent years, low natural gas prices have allowed natural gas-fired EGUs to reduce their operating costs and to displace coal as the marginal fuel for many hours of the year in wholesale energy markets nationwide. The substantial drop in natural gas prices beginning in late 2008 and early 2009, reinforced more recently by a surge of new renewable resources, has driven down the amount of power generated from coal in the U.S. quite significantly. This trend is readily apparent in coal-fired EGU generation data over the past several years at national, regional, company-wide, and individual plant levels.

[20] Bolinger, *supra* n. 8, at 33, 35, and 37.

28. As shown in Figure 6 below, coal-fired generation dropped from 48.5 percent of total U.S. electric generation in 2007 to 38.7 percent in 2014 and to only 34.5 percent in the first eight months of 2015.[21] At the same time that coal usage has been declining, the percentages of total U.S. electric generation from natural gas and non-hydro renewable resources have been increasing significantly.

Fig. 6: Total U.S. Electric Generation from Coal, Natural Gas and Non-Hydro Renewable), 2007 Through the First Eight Months of 2015[22]



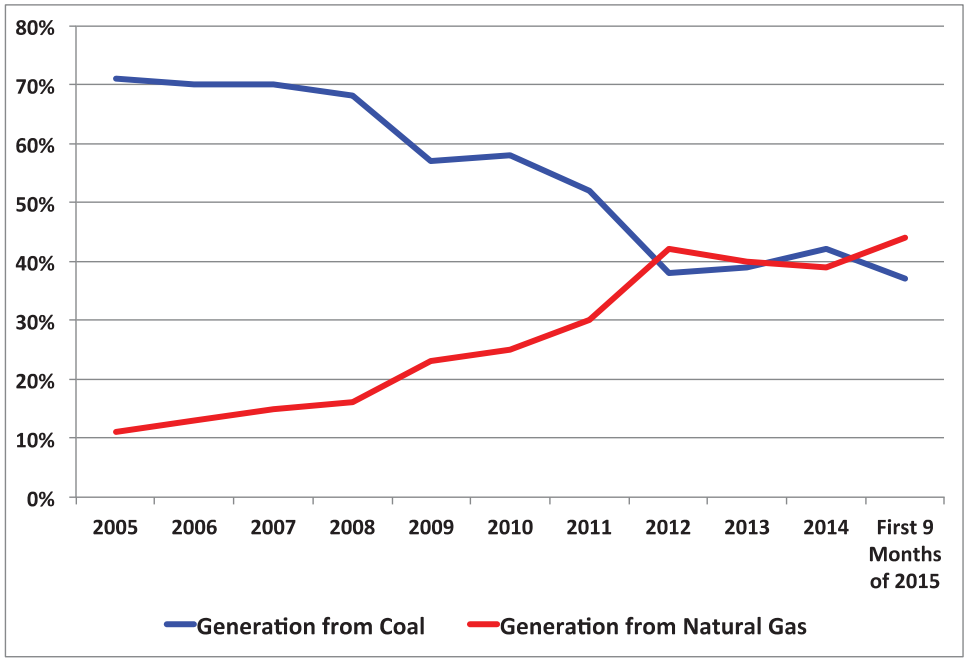
[21] Derived from EIA, *Electric Power Monthly* (Feb. 2015 and Aug. 2015), workpaper for Table 1_01, *available at* http://www.eia.gov/electricity/monthly/index.cfm.
[22] *Id.*

29. As the trends shown in Figure 6 suggest, generation from coal in the regional markets operated by independent system operators has also declined significantly since 2007. For example, coal represented 55 percent of the fuel mix in PJM in 2007.[23] However, by 2014, coal generation was only 43.5 percent of the fuel mix,[24] declining to just 38.5 percent in the first three quarters of 2015.[25] Compared to the first nine months of 2014, coal generation decreased 13.6 percent during the first three quarters of 2015.[26]

30. The generation from individual company coal-fleets also declined precipitously as a result of the increasing competition from natural gas, as illustrated in Figure 7 below.

[23] PJM, *2007 State of the Market Report*, Vol. II (Mar. 11, 2008), at 110, *available at* http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2007.shtml.
[24] PJM, *2014 State of the Market Report*, Vol. II (Mar. 12, 2015), at 16, *available at* http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2014/2014-som-pjm-volume2.pdf.
[25] PJM, *2015 Quarterly State of the Market Report, January – September* (Nov. 12, 2015), at 70, *available at* http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2015/2015q3-som-pjm.pdf.
[26] *Id.*

Fig. 7: Southern Company Generation from Coal and Natural Gas, 2005-2015[27]

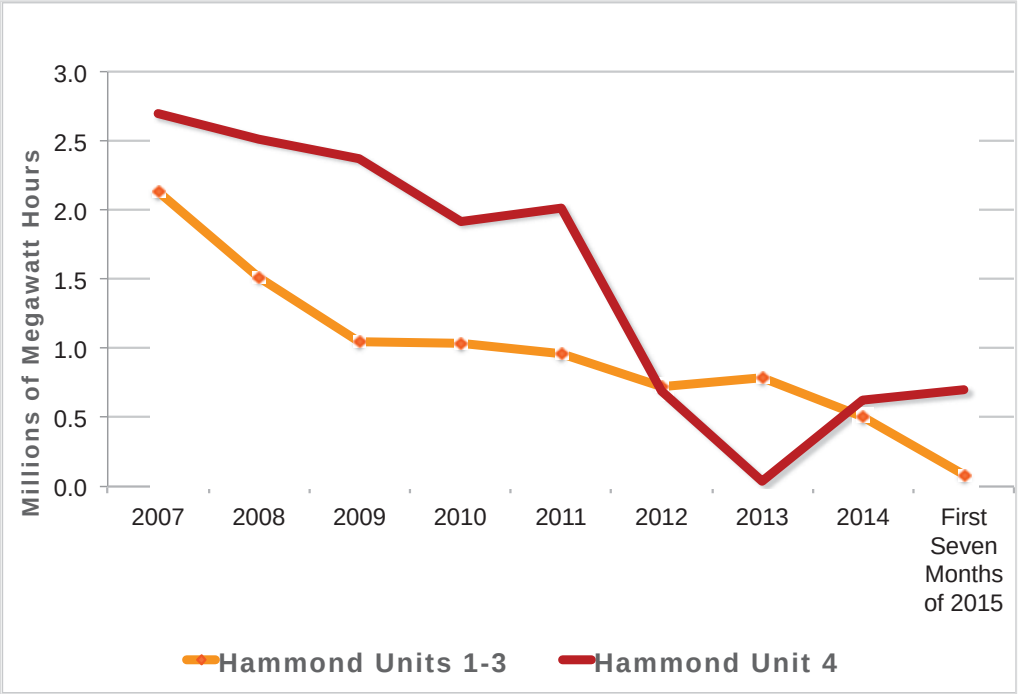


31. Southern Company's generation from coal declined from 70 percent of its total generation in 2007 (before natural gas prices began to decline in late 2008/early 2009) to 37 percent in the first three quarters of 2015. At the same time, as shown in Figure 7, Southern Company's generation from natural gas tripled from 15 percent in 2007 to 44 percent in the first three quarters of 2015.

[27] Data derived from Southern Company Form 10-K SEC Filings for the years 2005-2014 and Form 10-Q Filing for the third quarter of 2015.

32. The heightened competition from natural gas, and more recently, renewable resources, has meant that many coal-fired EGUs that previously operated as baseload units—meaning that they were operated to generate power as much around the clock as possible—have been reduced to being dispatched as monthly or seasonal peaking units, or have not been operated at all. Georgia Power Company's four coal-fired units at Plant Hammond provide a vivid example of how low natural gas prices have affected the generation at previously baseload-operated coal-fired EGUs.

Fig. 8: Annual Generation at Plant Hammond Units 1-4, 2005-July 2015[28]



33. Such intermittent operation compromises coal plant efficiency and, as a result, economic viability—and is completely independent of the Clean

[28] Data derived from Hammond's EIA Form 923, as reported by SNL Financial.

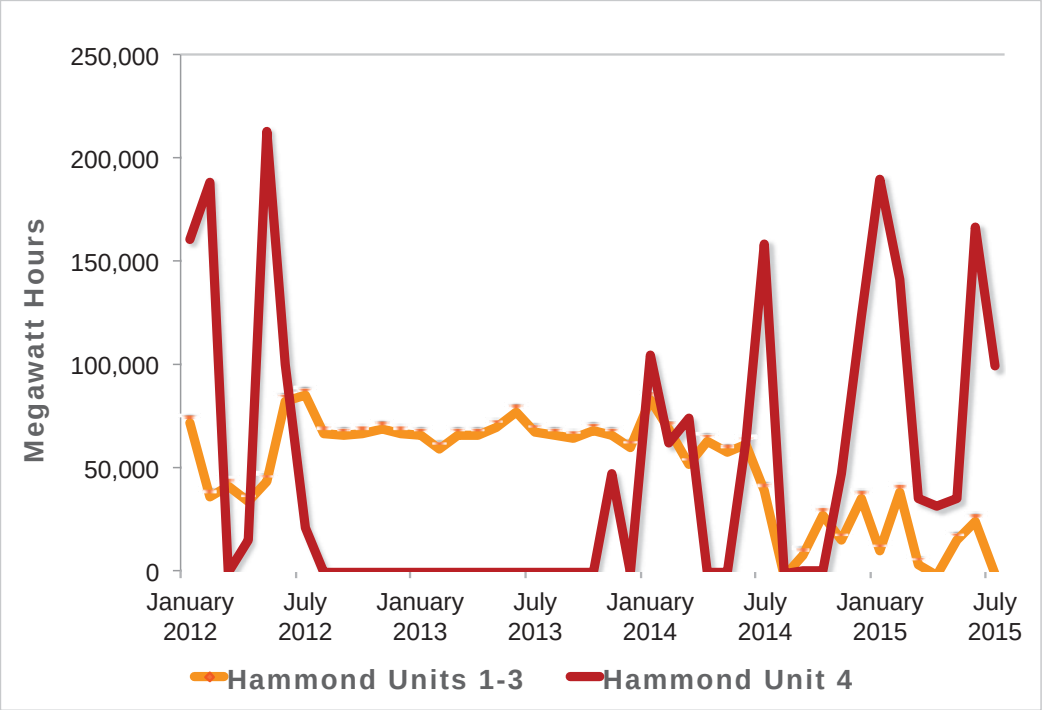
Power Plan. Intermittent operation, with frequent start-ups and power-downs, puts stress on plant components, raises their variable operating costs, and causes more frequent outages.[29] As a result, plant operators often find it more profitable to retire aging coal plants rather than operate them as intermittent units for extended periods of time.

34. As shown in Figure 8 above, even the amount of power generated by the largest and newest EGU at Plant Hammond—Unit 4—has declined significantly since 2008, except for a slight uptick in early 2014 due to the Polar Vortex Event.

35. A closer look at month-by-month generation over the past three years shows that Units 1-3 at Plant Hammond have generated only very small amounts of power in any given month. Unit 4 has essentially become a seasonal "peaker," producing the greater portion of its output in the high-demand summer and winter months, with little-to-no generation the rest of the year.

[29] Anya Litvak, *What happens when coal plants move from leaders to followers?*, Pittsburg Post-Gazette (Nov. 24, 2015), *available at* http://powersource.post-gazette.com/powersource/consumers-powersource/2015/11/24/What-happens-when-coal-plants-move-from-leaders-to-followers-baseload-cycling/stories/201511240007.

Fig. 9: Monthly Generation at Plant Hammond Units 1-4, 2012 – July 2015[30]



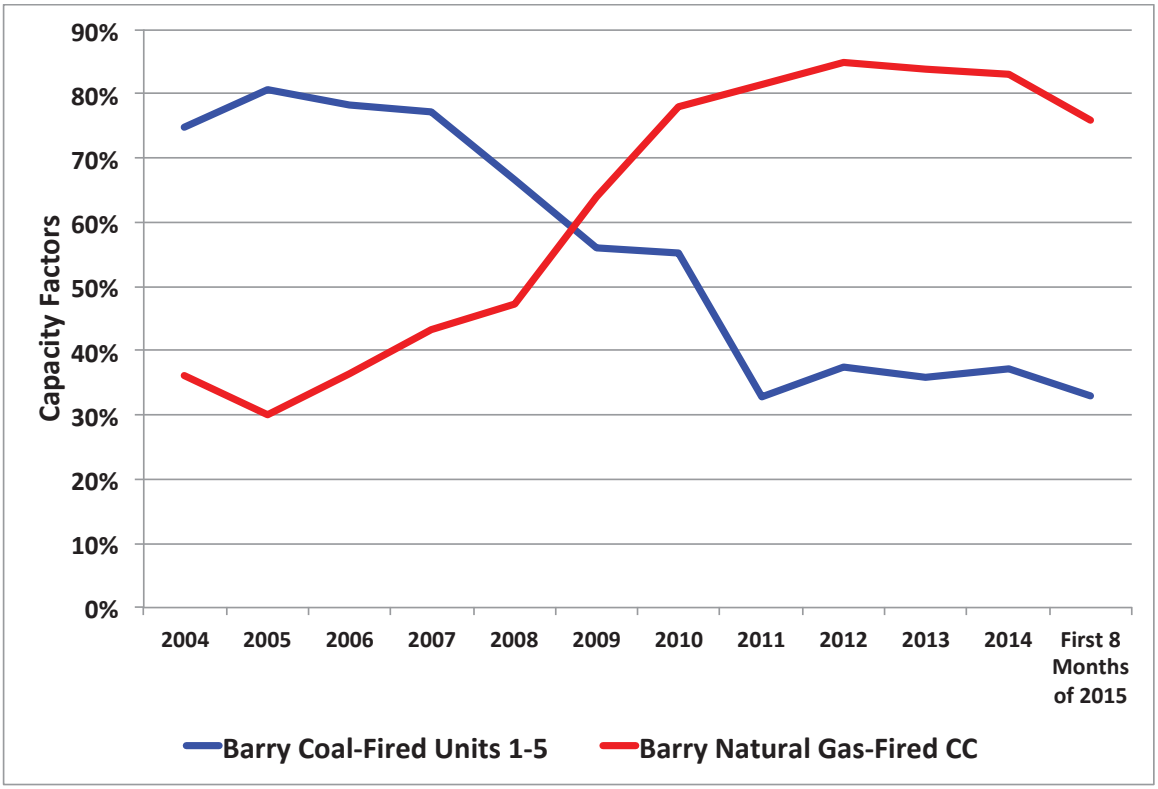
36. The industry metric "capacity factor" compares how much power an EGU actually generates in a specific time period, such as a month or a year, with how much power the plant would have produced if it had operated at its full capacity for all of the hours in the time period. A baseload EGU, like Plant Hammond used to be, typically operates at an average 60 to 80 percent capacity factor each year. However, Plant Hammond's operations have declined so substantially that the entire plant has averaged only a 16 percent capacity factor since the beginning of 2012.[31]

37. The impact that low natural gas prices have had on generation at coal-fired EGUs is, perhaps, most dramatically shown by those power plant sites

[30] *See supra* n. 28.
[31] *Id.*

that have both coal- and natural gas-fired EGUs. For instance, Figure 10 below shows how generation at the single combined cycle gas-fired unit at the Barry Electric Generating Station in Alabama has increased dramatically since 2008/2009, while at the same time, generation at Barry's five coal-fired units has declined substantially.

Fig. 10: Annual Generation at Barry Coal-Fired and Natural Gas-Fired Units, 2004 through the First Eight Months of 2015[32]



38. To summarize, the key points about this historic decline in coal-fired generation are that: (1) this trend is entirely independent of the Clean Power Plan; (2) the low gas prices and the increased development of less expensive renewable resources that led to coal's decline are likely to continue to

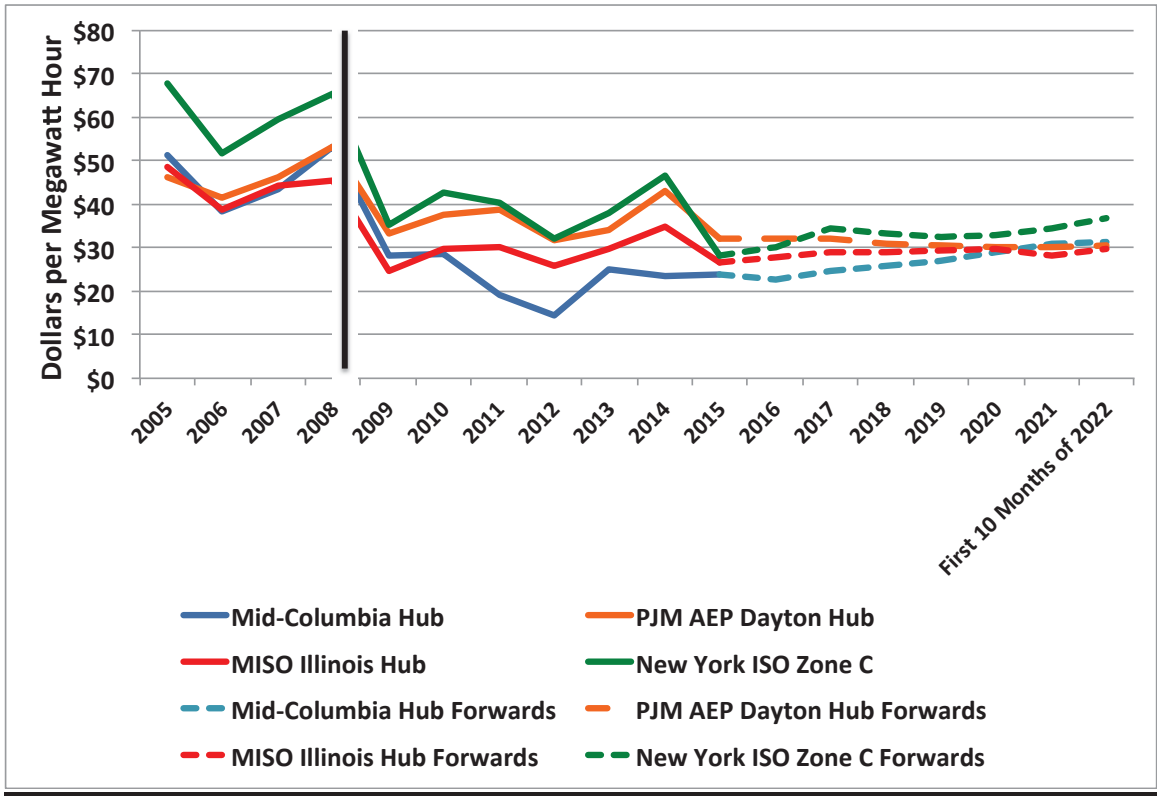
[32] Data derived from Hammond's EIA Form 923, as reported by SNL Financial.

undermine the viability of existing coal-fired EGUs for years, if not permanently; (3) as coal generation declines and units transition from baseload to intermittent operation, they become even less economic; and (4) these factors will lead to the retirement of more coal-fired EGUs in coming years, including many of the EGUs listed in Exhibits 29 and 31 of the Declaration and Report of Seth Schwartz.

D. The Collapse in Natural Gas Prices Has Led to a Steep Decline in Wholesale Electricity Prices.

39. At the same time that coal-fired electricity generation has declined substantially, wholesale electricity prices in markets around the nation also have declined as a result of low natural gas prices. This can be seen clearly in Figure 11 below, which depicts power prices in representative markets in the Northeast, the Midwest, and the Northwest.

Fig. 11: Energy Market Prices in Representative Wholesale Markets, 2005-2022[33]



40. The vertical line in Figure 11 represents the period in late 2008/early 2009 when natural gas prices began to decline precipitously.

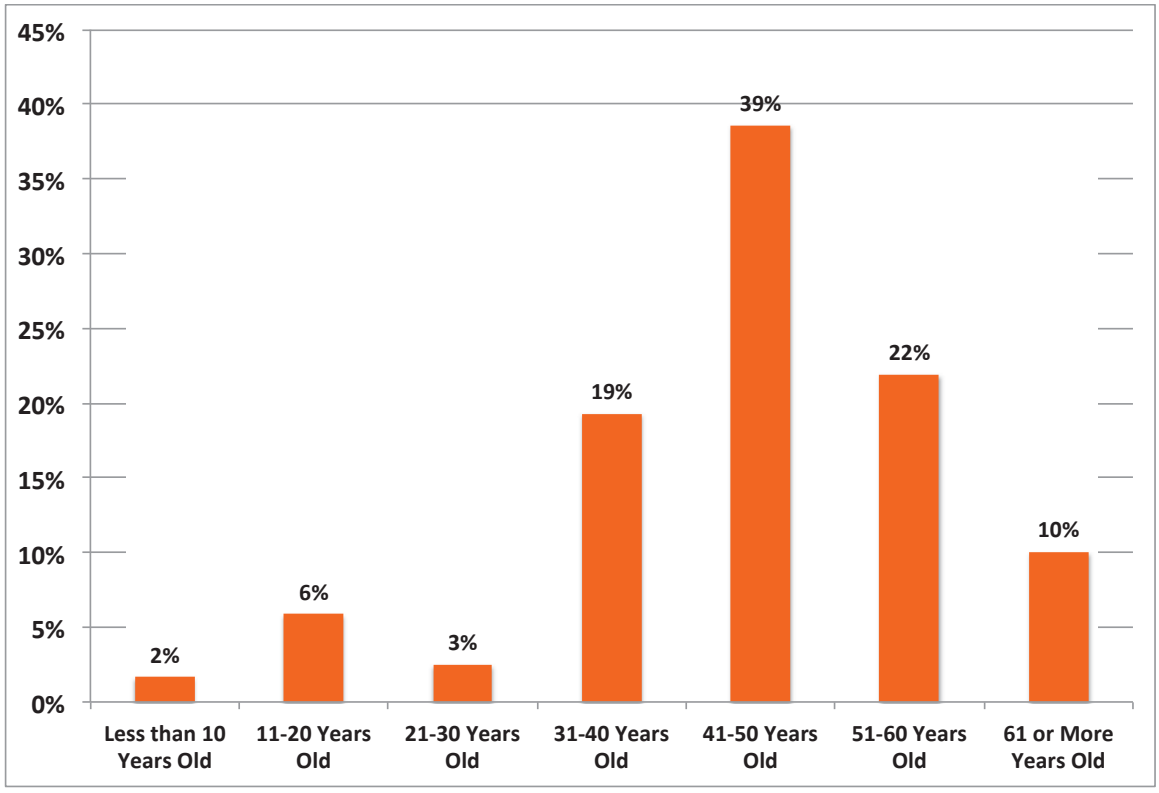
41. Because natural gas prices determine the clearing prices in wholesale energy markets during many hours of the year (i.e., the price that *all* generators receive when they sell power into the market during the hour), energy market prices are expected to remain low for the foreseeable future, as Figure 11 indicates.

[33] Data for this chart derived from SNL Financial.

E. The American Coal Fleet is Aging.

42. The U.S. fleet of coal-fired EGUs is aging. As shown in Figure 13 below, by 2022, more than 70 percent of existing coal-fired capacity (in MW) will be over 40 years old and almost one-third (32 percent) will be over 50 years old.[34] Less than 10 percent of existing U.S. coal-fired capacity will be under 20 years old[35] as few new coal-fired EGU have started operations in the last decade and only one new coal-fired power plant has broken ground in the last seven years.

Fig. 12: Age of the U.S. Coal Fleet in 2022 (as percentage of total MW of existing coal-fired EGU capacity)



[34] Coal plant ages derived from data from SNL Financial.
[35] *Id.*

43. The average age of the coal-fired EGUs that have retired since the beginning of 2010 has been 53 years.[36]

44. The median age of the coal-fired EGUs listed in Exhibit 29 of Seth Schwartz's Declaration and Report is 43 years.[37] The average age of these units is 45 years.[38] By the end of the Clean Power Plan compliance period in 2030, these plants would, on average, be 60 years old if they continue operating.[39]

45. Babcock & Wilcox, an experienced designer and builder of fossil fuel-fired and nuclear EGUs, including coal-fired plants, has identified the consequences of plant aging as follows:

> **"Power Plant Aging**
>
> At the beginning of power plant life there is a period in which the operators and maintenance crews learn to work with the new system and minor problems are resolved. This period may be marked with a high forced outage rate, but this quickly declines as the system is broken in.
>
> As the plant matures, the personnel adapt to the new system, and any shortcomings are overcome or better understood. During this phase the forced outage rate remains low, availability is high, and the operating and maintenance costs are minimal. This mature phase normally lasts 25 to 30 years, depending on the design and use of the unit. The power plant is usually operated near rated capacity during this period.
>
> Following this phase, the aging process becomes noticeable. Forced outages and maintenance costs increase and availability

[36] Data on coal plant retirement ages from SNL Financial.
[37] *See* NMA Stay Motion, Schwartz Decl. and Report, Ex. 29; coal EGU retirement data provided by SNL Financial.
[38] *Id.*
[39] *Id.*

declines. Component end of life usually causes the higher forced outage rate. Occasional operational error and the degradation of boiler components due to erosion, corrosion, creep and fatigue lead to localized failures. The forced outage rate steadily increases during this phase unless major overhauls or component replacements are instituted.[40]

* * * *

Traditional Roles of the Aging Plant

As the aging plant becomes less reliable, its role is often changed. Newer, more reliable plants are less costly to maintain and are generally more efficient to handle the base power load. The older plants become auxiliary units or are designated for peaking service. Older plants with higher heat rates, i.e., lower efficiencies, or with low capacity may be retired. Prior to the 1980s, it was assumed that older plants would be torn down to make room for the newer, larger, more efficient units. It was common to retire a plant after 35 to 40 years of service.

This planned obsolescence began to change in the early 1980s. The cost of newer, more efficient plants became more than most boiler operators could readily finance. As a result new construction was delayed and plans to retire the older plants were put on hold. The need to keep the older units running brought about a new strategy of *life extension*. This is a strategy that delays the plant retirement while maintaining acceptable availability. The strategy requires the replacement of some components to keep the plant running with acceptable forced outage rates and maintenance costs. These replacements or repairs expand upon those traditionally incorporated in a plant maintenance program. Significant capital expenditures are normally required to affect the availability rate."[41]

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[40] Babcock & Wilcox, Steam, Its Generation and Use, 40th Edition, (1992), Chapter 46, at 46-1 *et seq.*

[41] *See id.* at 46-1 and 46-2.

46. Therefore, it is reasonable to expect that additional coal-fired EGUs will be retired in coming years due to unfavorable economics resulting from (a) higher annual operating and maintenance costs as they age; (b) the need for additional capital investments as they age; and (c) degradation in their operating performance as they age, in terms of lower net generation and higher planned and forced outage rates. These factors are independent of the Clean Power Plan. In conjunction with the availability and cost of lower cost natural gas and renewable wind and solar resources, these factors will undermine the future viability of existing coal-fired EGUs and will affect when individual coal-fired units will retire.

F. Many Coal-Fired EGUs are Becoming Increasingly Expensive to Operate.

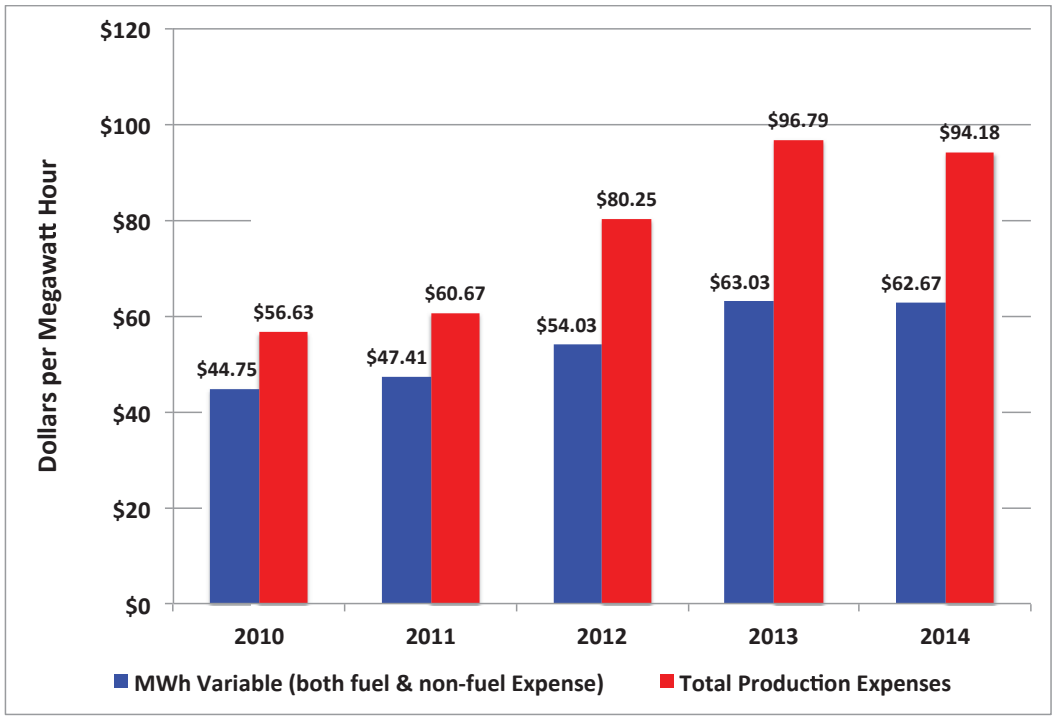
47. The annual per-MWh costs of generating power at coal-fired plants around the U.S. have increased significantly in recent years. In part, this is due to the decline in plant generation discussed earlier in this declaration. However, in large part, the increased cost of producing power at coal plants is due to a substantial increase in those plants' fixed and variable fuel and non-fuel operations and maintenance ("O&M") costs.

48. For example, the cost of generating power at Plant Hammond increased by about two-thirds between 2010 and 2014.[42] This increase was driven in part by a 40 percent increase in the plant's variable fuel and non-

[42] Data derived from Georgia Power Company's FERC Form 1 filings for the years 2010–2014.

fuel O&M expenses.[43] Figure 13 below depicts the recent surge in O&M costs and total production expenses at Plant Hammond.

Fig. 13: The Increasing Cost of Producing Power at Plant Hammond[44]



49. Thus, the average cost of producing a single MWh of power at Plant Hammond increased at a compound annual rate of 13.5 percent for the four-year period.

50. Other examples of the escalation of O&M costs at coal-fired EGUs include the McIntosh Unit 3 coal plant in central Florida, whose O&M costs increased at an annual compound rate of 8 percent between 2009 and 2014,[45] and Colstrip Units 1 and 2 in eastern Montana, whose O&M costs more than

[43] *Id.*
[44] *Id.*
[45] City of Lakeland, Florida. Department of Electric Utilities, Notes to Financial Statements for the Years 2008-2014.

doubled between 2003 and 2014, a compound increase of almost 7 percent per year.[46]

51. Another example is the Huntley coal-fired EGU in upstate New York. Huntley Power, LLC, the owner of this plant, has said that it is being retired due to current power prices and market conditions in New York State: "it is no longer economical to continue to operate the Facility and . . . it is not expected that it will become economic to operate the Facility [in coming years]."[47] Although Huntley Power has petitioned FERC to approve an interim four-year Reliability Must Run agreement to keep the plant in service, NYISO recently determined that only very minor transmission system upgrades would obviate any potential need to keep the plant online for reliability purposes past a proposed 2016 retirement date.[48] In its submission to FERC, Huntley Power reported that the plant had a gross margin (i.e., total revenues less variable costs) of just $16.4 million for the 12-month period ending July 31, 2015, compared to a total service cost of approximately $80.3 million. In fact, the $16.4 million gross margin was insufficient to cover anything more than 60 percent of the plant's fixed O&M expenses, "let alone any other component of the cost of service."[49]

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[46] Puget Sound Energy FERC Form 1 filings for the years 2003–2014.
[47] Huntley Power LLC, Reliability Must Run Service request to FERC (Oct. 14, 2015), at 4.
[48] Letter from Richard Dewey, Exec. VP, NYISO, to Raj Addepalli, Managing Director, Utility Rates and Service, New York Dep't of Public Service (Oct. 30, 2015), *available at* http://www.nyiso.com/public/webdocs/markets_operations/documents/Legal_and_Regulatory/NY_PSC_Filings/2015/NYISO_PSC_letter_Huntley_2015-10-30_clean.pdf.
[49] *Id.*

52. The annual fixed and variable production expenses exemplified in Figure 13 above do not represent the total cost of producing power at coal-fired EGUs. In addition, plant owners must undertake capital expenditures, or "capex," to upgrade or replace the plant's equipment, structures, and components that have worn down either through use or age. These capex vary from plant-to-plant and year-to-year, but can be quite significant depending on the size and age of the plant and what specific equipment upgrades have been completed. For example, Georgia Power invested over $540 million on capex at Plant Hammond between 2008 and 2014, an average of over $75 million per year.[50]

53. As another example, the owners of the smaller McIntosh Unit 3 invested more than $70 million capex in the plant between October 1, 2008 and September 30, 2014, an average of nearly $12 million in capital costs per year.[51]

54. The already expensive cost of power from existing coal-fired EGUs can be expected to rise even more in the near future. New capex and increased annual O&M expenses will be needed in coming years as a result of plant aging, as discussed in paragraphs 47 through 53 and in cases where inefficient, high-emitting units make upgrades to meet the requirements of EPA rules other than the Clean Power Plan. These additional costs will further reduce these plants' competitiveness. In determining whether to

[50] Georgia Power Company, FERC Form 1 Filings for the years 2008-2014.
[51] City of Lakeland, Florida. Department of Electric Utilities, Notes to Financial Statements for the Years 2008-2014.

upgrade plants to achieve compliance, owners may consider whether the plants will be competitive given the likelihood of a carbon-regulated future. But a decision to close such a plant rather than invest further to comply with current regulations would be a voluntary business decision, not something compelled by the Clean Power Plan.

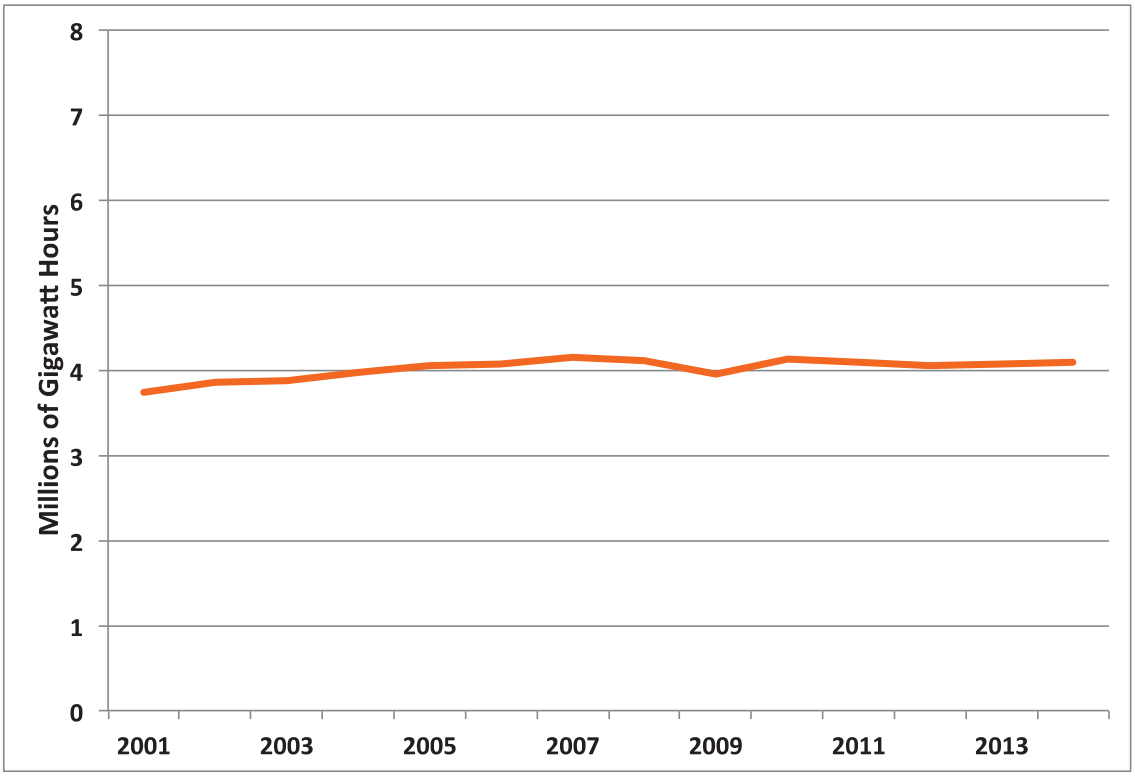
55. All of these added costs will make continued operation of coal-fired EGU more expensive and less economically competitive than natural gas-fired and renewable alternatives. These costs are already increasing and are unrelated to the Clean Power Plan.

G. The Growth in Electric Power Usage Has Slowed Due to Structural Economic Factors and Improved Efficiency.

56. In my opinion, existing coal-fired EGUs cannot depend on future growth in electricity usage as the basis for any significant increases in plant generation and revenues.

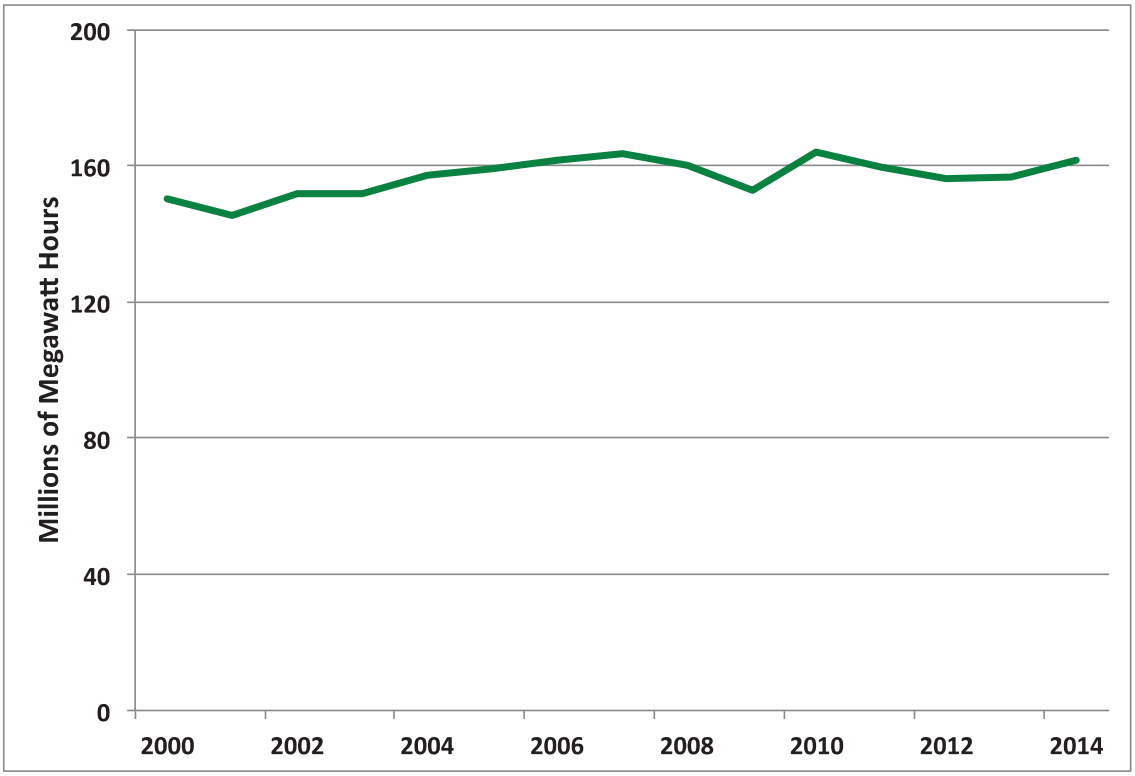
57. As shown in Figures 14a and 14b below, national and regional demands for electric power have been relatively flat for the past ten years, with little growth since 2001.

Fig. 14a: Total U.S. Electric Electricity Usage, 2001-2014[52]



[52] EIA, Table epa_02_02, *available at* http://www.eia.gov/electricity/data.cfm#sales.

Fig. 14b: Southern Company Retail Electric Sales, 2000-2014[53]



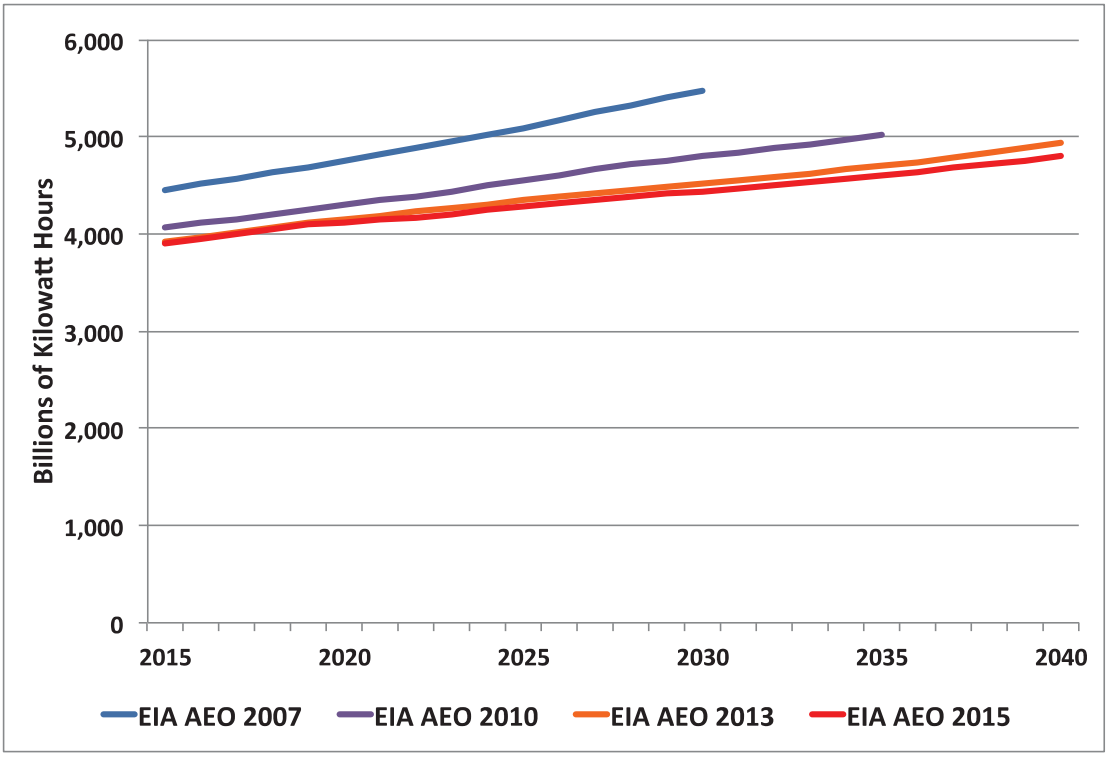
58. At the same time, energy demand forecasts have been declining in recent years as utilities and other load-serving entities reduce their expectations for how much power they will need in coming years.

59. For example, the Energy Information Administration's ("EIA") forecasts of national electric usage have declined dramatically between 2007 and 2015. In fact, as shown in Figure 15, the total electric demand that EIA

[53] *See* Southern Company Form 10-K filings for the years 2000-2014. Southern Company owns approximately 46,000 megawatts of generating capacity and serves 4.4 million customers over 120,000 square miles in Alabama, Florida, Georgia, and Mississippi. *See Out Business: Overview*, http://www.southerncompany.com/about-us/our-business/home.cshtml. Southern's retail sales thus serve as a good proxy for regional load in the southeastern U.S.

predicted in 2007 would be achieved in 2020 will not be experienced until 2040 under EIA's latest projections.

Fig. 15: EIA Forecasts of U.S. Electric Demand from 2007, 2010, 2013, and 2015[54]



60. Investment in energy efficiency savings is a significant reason for this trend. U.S. spending on electric energy efficiency programs exceeded $24 billion in the years 2010-2014 according to the American Council for an Energy-Efficiency Economy ("ACEEE").[55] ACEEE estimates that the total savings from energy efficiency programs totaled approximately 25.7 million

[54] Chart generated from the files for EIA's *Annual Energy Outlook reports* for the years 2007, 2010, 2013, and 2015, *available at* http://www.eia.gov/forecasts/aeo/ and http://www.eia.gov/forecasts/aeo/archive.cfm.

[55] ACEEE, *2015 State Energy Efficiency Scorecard* (Oct. 2015), at 23, *available at* http://aceee.org/research-report/u1509.

MWh in 2014, a 5.8 percent increase from 2013.[56] Equal or greater annual MWh savings can reasonably be expected in future years as (1) spending on electric efficiency programs typically produces savings in more than a single year, and (2) additional investments are made in energy efficiency as state and federal energy efficiency regulations become more stringent over time.

61. The increasing installation of more distributed rooftop solar PV resources also will keep electric system loads down, as electricity that would otherwise have been provided by the grid will instead be supplied by solar PV capacity located at the load location. This will act to reduce the demand on the system as a whole. In addition, in places with "net metering," these distributed PV resources will contribute excess electricity to the grid part of the time, reducing needs for power from central generating stations.

H. The Financial Value of Domestic U.S. Coal-Fired EGUs Declined Significantly Since 2008.

62. The fundamental market forces and factors I have discussed have led to dramatic declines in the values of many domestic U.S. coal fleets between 2008 and 2013. Figures 16a and 16b, based on an analysis by FitchRatings,[57] display these trends.

[56] *Id.* at viii.
[57] Fitch Ratings, *The Erosion in Power Plant Valuations* (Sept. 25, 2013), *available at* www.fitchratings.com.

Fig. 16a: Declines in Coal Fleet Valuations (Net Present Value, in Dollars per KW of Capacity in Each Fleet) Between 2008 and 2013[58]

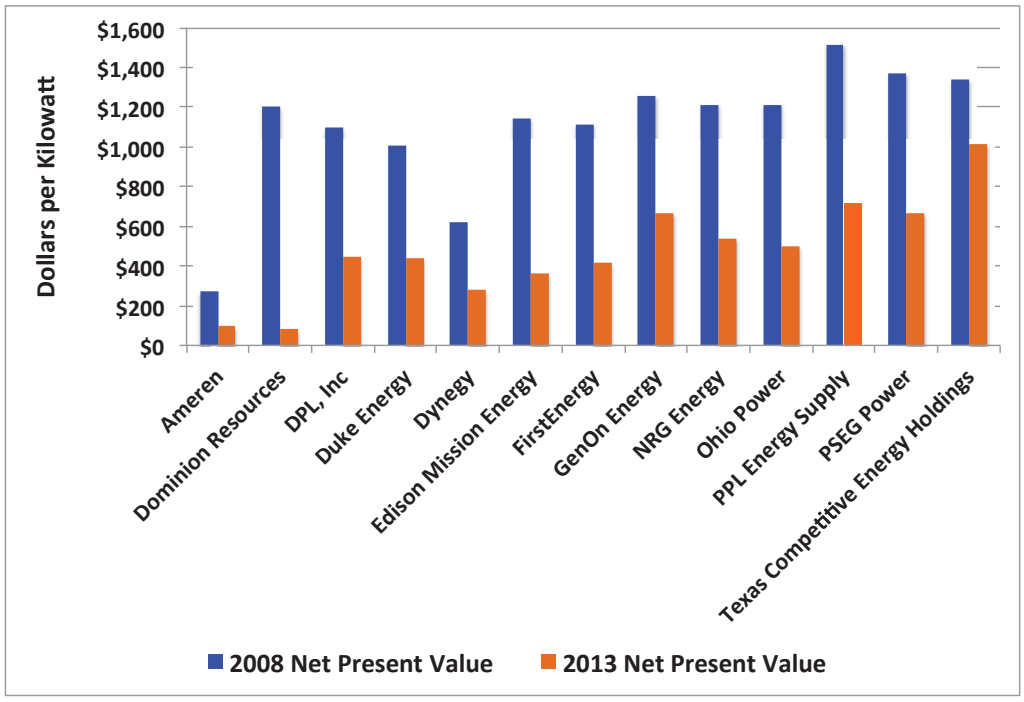
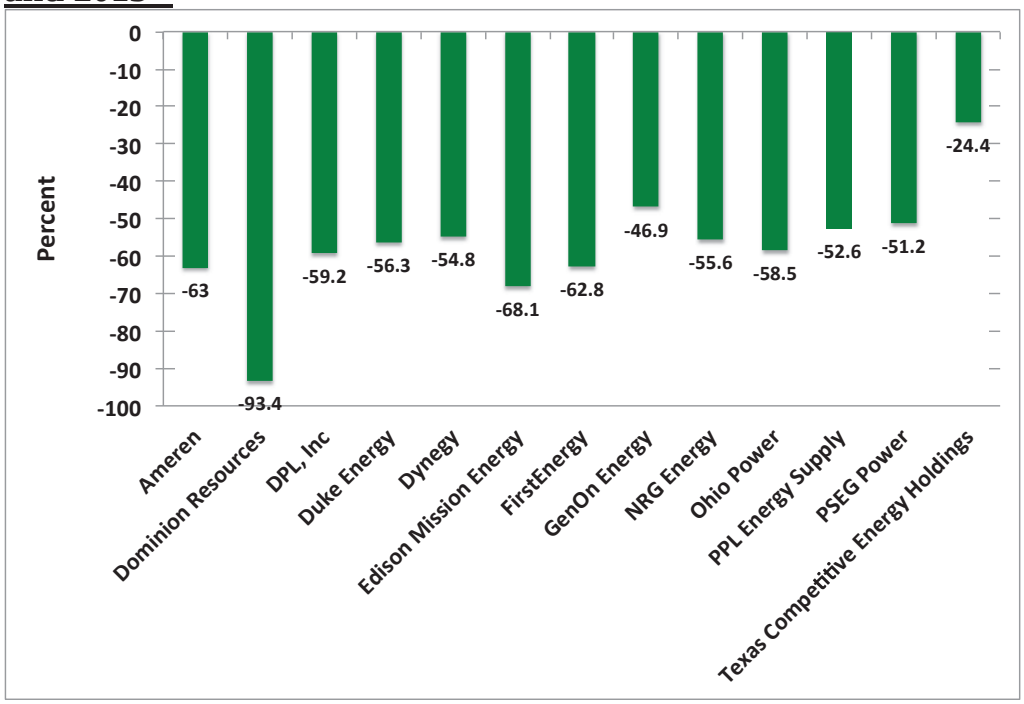


Figure 16b: Percentage Declines in Coal Fleet Valuations Between 2008 and 2013[59]



[58] *Id.*
[59] *Id.*

63. The market for merchant coal-fired EGUs is deteriorating rapidly. For example, Dynegy bought the Danskammer plant in Newburgh, New York (along with a partial share of the Roseton plant) for $900 million in 2001.[60] When the plant was resold in 2013, its value had plummeted to just $3.5 million.[61] As another example, Dominion Resources sold its 1600 MW Brayton Point coal plant in Southeastern Massachusetts for an estimated $55 million in 2013,[62] shortly after spending $1 billion to complete capital upgrades on the plant.[63] One month after acquiring the plant, the new owner announced a decision to retire Brayton Point in 2017.[64]

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[60] *Central Hudson closes sale on Roseton and Danskammer generating plants*, Power Engineering (Feb. 2, 2001), *available at* http://www.power-eng.com/articles/2001/02/central-hudson-closes-sale-on-roseton-and-danskammer-generating-plants.html.

[61] *Dynegy Announces Results of Roseton and Danskammer Auction*, BusinessWire (Dec. 10, 2012), *available at* http://www.businesswire.com/news/home/20121210006337/en/Dynegy-Announces-Results-Roseton-Danskammer-Auction.

[62] Joe C. Goode, *Somerset's Brayton Point power station sold to private equity firm*, The Herald News (Mar. 11, 2013), *available at* http://www.heraldnews.com/article/20130311/NEWS/303119890. Brayton Point was sold in a package deal with two other power plants that was projected to result in after-tax proceeds of approximately $650 million. Although Dominion did not publicize the specific sale price of Brayton Point, analysts have estimated its value to have been approximately $55 million at the time of the sale. *See* Institute for Energy Economics and Financial Analysis, Press Release, *Connecticut's Last Coal-Fired Power Plant Is in Critical Financial Condition, Community Needs to Plan for Transition* (Jan. 23, 2014), *available at* http://ieefa.org/press-release-connecticuts-last-coal-fired-power-plant-is-in-critical-financial-condition-community-needs-to-plan-for-transition/.

[63] *See* Steve Urbon, *Brayton Point to shut down as of June 2017*, South Coast Today (discussing capital expenditures at Brayton Point) (Oct. 7, 2013), *available at* http://www.southcoasttoday.com/article/20131007/NEWS/131009917.

[64] Alex Kuffner, *New owners to shutter outmoded Brayton Point Power Station in 2017*, Providence Journal (Oct. 8, 2013), *available at* http://www.providencejournal.com/article/20131008/News/310089995.

I. Petitioners Misrepresent the Coal-Fired EGUs that Would Have to Retire in the Short-Term Due to the Clean Power Plan.

64. Given the factors that I have discussed, large numbers of additional coal-fired EGUs are likely to be retired in the coming years irrespective of the Clean Power Plan. As an illustration of the impact of the market forces and economic trends I have discussed thus far, between the beginning of 2009 and March, 2014—before the Clean Power Plan was even proposed, let alone finalized—more than 22 GW of coal-fired EGU capacity were retired and another 27 GW were announced for retirement.[65] In addition to outright retirements and announcements, an additional 11 GW of coal-fired EGU capacity was being targeted for conversion to burn other fuels, primarily natural gas.[66]

65. In claiming that numerous specific units will be forced to retire imminently due to the Clean Power Plan, petitioners not only misuse EPA's IPM modeling (*see* Burtraw Declaration ¶¶ 16–27) and ignore the Clean Power Plan's extended schedule and flexible compliance options (*see* Tierney declaration ¶¶ 39–44, 48–56), they also misrepresent the circumstances surrounding those plants and the reasons that many of them are uneconomical.

66. For example, in his declaration, Robert Frenzel of Luminant asserts that "EPA's IPM modeling shows Monticello Units 1 and 2 as completely

[65] Data on coal plant retirements and announcements derived from SNL Financial.
[66] *Id.*

shut down in 2016 under all cases."[67] The Chamber of Commerce has also submitted a number of declarations discussing social and economic consequences of retiring Monticello Units 1 and 2.[68] These assertions are misleading. In fact, these two Monticello units were not included in either the IPM "base case" (discussed more below) or the two modeling runs.[69] The agency's modeling therefore says nothing about how the Clean Power Plan may or may not affect Monticello 1 and 2.

67. If Monticello 1 and 2 do retire in the near future, it will be due to factors that have nothing to do with the Clean Power Plan. In 2012, Luminant determined that these two units could no longer compete in the marketplace as year-round generators and requested that they be seasonally idled starting in December of that year.[70] As a Luminant spokesperson explained, "[w]ith power prices very low, those two units are not economical to run during these low demand seasons."[71]

68. Luminant has been heavily dependent on coal-fired generation for many years, having bet extensively on high gas and clean energy prices in

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[67] UARG Stay Petition, Frenzel Decl. ¶ 40.
[68] *See generally* Chamber of Commerce Stay Petition, Declarations of Blanton, Smith, Kennedy, and Witherspoon.
[69] EPA, *EPA Base Case v.5.15 Using IPM— Incremental Documentation* (Aug. 2015), at Table 4-36: Capacity Not Included Due to Recent Announcements (listing Monticello Units 1 and 2 as excluded from modeling), *available at* http://www2.epa.gov/sites/production/files/2015-08/documents/epa_base_case_v.5.15_incremental_documentation_august_2015.pdf.
[70] Terrence Henry, *Luminant Coal Units Get Permission to Mothball This Winter*, State Impact (Oct. 31, 2012), *available at* https://stateimpact.npr.org/texas/2012/10/31/luminant-coal-units-get-go-ahead-to-mothball-this-winter/.
[71] *Id.*

making its strategic investment decisions.[72] On April 29, 2014 the parent company of Luminant, Energy Future Holdings, conceded it had lost that bet and filed for bankruptcy because of low power prices making its coal fleet uneconomic.[73] This is one of the largest bankruptcies in U.S. history.[74]

69. Coal-fired EGUs in Texas like Monticello 1 and 2 are struggling to compete with other, cheaper sources of electricity. For example, wind power has become so plentiful in ERCOT that on September 20 of this year, the spot price of electricity fell below $0/MWh for a period, hitting negative $8.52 per megawatt hour at its lowest point.[75] ERCOT also predicts a massive expansion in Texas's solar industry in the coming years, forecasting a 50-fold increase in generation capacity by 2030 even in under a "business as usual" projection.[76] Indeed, in announcing Luminant's purchase of a 116-

[72] Ken Silverstein, *Big gamble felled Energy Future Holdings. Safe bet could resuscitate it*, The Christian Science Monitor (May 2, 2014) ("'It teaches a lesson, which is using debt to make a bet on gas prices is unwise,' says Bob Bellemare, chief operating officer of consulting firm Mykrobel in New Mexico, in an interview. 'They bet and they lost and this is the aftermath.'"), *available at* http://www.csmonitor.com/Environment/Energy-Voices/2014/0502/Big-gamble-felled-Energy-Future-Holdings.-Safe-bet-could-resuscitate-it

[73] Energy Future Holdings, Restructuring: Information for TXU Energy Customers, https://www.energyfutureholdings.com/restructuring/information-for-txu-energy-customers/ (last visited Dec. 6, 2015).

[74] Jim Malewitz, *Massive Bankruptcy Tests Texas Utility Regulators*, The Texas Tribune (Aug. 28, 2015), available at http://www.texastribune.org/2015/08/28/mammoth-bankruptcy-deal-looms-texas-utility-regula/.

[75] Robert Walton, *Record wind generation pushes ERCOT prices into negative territory*, Utility Dive (Sept. 15, 2015), *available at* http://www.utilitydive.com/news/record-wind-generation-pushes-ercot-prices-into-negative-territory/405606/; Samantha Solomon, *Want Free Electricity? Move to Texas*, Wall St Daily (Sept. 29, 2015), *available at* http://www.wallstreetdaily.com/2015/09/29/texas-negative-energy-prices/.

[76] Christian Roselund, *Texas grid operator predicts 50-fold increase in solar by 2030*, PV Magazine (Oct. 16, 2015), *available at* http://www.pv-

MW solar facility last September, Luminant CEO Mac MacFarland stated that "solar generation costs have become increasingly competitive."[77]

70. Monticello 1 and 2 are now over 40 years old. They are already uneconomical due to market forces, and because they lack modern pollution control technology, they will likely require substantial capital investments in the near future—potentially on the order of hundreds of millions of dollars—in order to remain online. Notably, when the Titus County Appraisal Review Board recently appraised the entire Monticello plant (including Unit 3) at $341 million for tax purposes, Luminant argued for an appraisal of just $50 million.[78] Luminant's own valuation of Monticello indicates that major capital investments at Units 1 and 2 would not be an economically sensible decision, and that near-term retirement would be the most rational course of action for those units.

71. Given that Monticello 1 and 2 are already uneconomical and outdated, petitioners have no support for their claims that the Clean Power Plan will cause the closure of those units at any point before or during the compliance period. They may retire in the near future, but it will be for reasons other than the Clean Power Plan.

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magazine.com/news/details/beitrag/texas-grid-operator-predicts-50-fold-increase-in-solar-by-2030_100021587/.

[77] Luminant, Press Release, *Luminant Solar Project Expands Diverse Mix of Generation* (Sept. 8, 2015), https://www.luminant.com/luminant-solar-project-expands-diverse-mix-of-generation-2/#.VlPXe3arS70.

[78] Marcia Davis, *Board stands ground on plant appraisal*, The Daily Tribune (July 1, 2015), *available at* http://www.dailytribune.net/news/board-stands-ground-on-plant-appraisal/article_4808f3fa-2041-11e5-9ec6-fbbde6d434de.html.

72. Another example of inaccurate or misleading testimony from petitioners is NorthWestern Energy's ("NWE") declaration. NWE's representatives claim that all four coal-fired units at Colstrip Generating Station in Montana will be forced into "premature retirement" due to the Clean Power Plan.[79] Specifically, they assert that, "[t]o achieve compliance under a rate-based program, Colstrip must cease operation in 2022."[80] However, the claim that all four units at Colstrip will close "prematurely" as a result of the Clean Power Plan is simply not credible. Units 1 and 2 are under substantial economic pressure and are likely to retire for reasons unrelated to the Clean Power Plan—a 2022 retirement date would not be premature in any event. Furthermore, there is no basis to the claim that Colstrip 3 and 4 will be forced to retire in 2022 due to the Clean Power Plan.

73. Even if it were true that the Clean Power Plan would require one or more of the Colstrip units to retire in 2022, this would not represent immediate, irreparable harm, and therefore no stay is warranted. Furthermore, NWE ignores the fact that state implementation plans under the Clean Power Plan may permit trading of credits or allowances for compliance. Without knowing what those markets will look like and what the prices of those allowances will be, NWE cannot credibly argue that retirement in 2022 is the only compliance option for Colstrip.

[79] NWE Stay Motion, Hines and Cashell Decl. ¶ 44.
[80] *Id.*

74. A decision to retire Units 1 and 2 in 2022 or sooner would not be premature. These units came online in 1975 and 1976 and were designed to operate for just 30 years, as discussed in Colstrip's original Environmental Impact Statement under Montana state law.[81] Forty years later, Colstrip 1 and 2 are now subject to significant cost pressure from cheaper generation resources, like purchased electricity from the wholesale Mid-Columbia Hub or wind power. To cite one pertinent example, NWE's own reports show that the company's Judith Gap wind farm generated electricity at less than half the rate of Colstrip from 2009 through 2015.[82] In fact, an analysis I authored showed that continued operation of Colstrip 1 and 2 would not be profitable for the owners of Talen Energy (a merchant company which owns 50 percent of the two units), nor would it be economical for the customers of Puget Sound Energy (which owns the other 50 percent of Colstrip 1 and 2).[83]

75. Colstrip is facing increased pressure to comply with environmental regulations other than the Clean Power Plan. While modern, state-of-the-art plants incorporate pollution controls into their design, aging and outdated units like Colstrip 1 and 2 often require retrofits to avoid polluting above

[81] Montana Dep't of Health and Environmental Sciences, Environmental Impact Statement on the Proposed Montana Power Company Electrical Generating Plant at Colstrip, Montana (Mar. 1973), at iii.

[82] Jason T. Brown, Montana Public Service Comm'n, *NorthWestern Energy Residential Electric Rates and Electricity Supply (Through June 2014)*, at 9, *available at* http://www.mtaffordableelectricity.org/wp-content/uploads/2015/10/2014-NWE-Electric-Rate-Graphs.pdf.

[83] David Schlissel and Cathy Kunkel, IEEFA, *A Bleak Future for Colstrip Units 1 and 2* (June 2015), *available at* http://ieefa.org/wp-content/uploads/2015/06/A-BLEAK-FUTURE-FOR-COLSTRIP-UNITS-1-AND-2.pdf.

legal limits. Such investments may not make economic sense for older units that are already unprofitable. For instance, Colstrip is expected to face investment decisions to comply with the recently-finalized coal ash rule that, for the first time, requires power plants to appropriately handle dangerous coal ash.[84] In addition, three of the four Colstrip units are the subject of a citizen suit action asserting multiple violations of the Prevention of Significant Deterioration program.[85] That lawsuit is scheduled to go to trial in 2016. These factors are further evidence that, unlike cleaner and cheaper sources of electricity, coal-fired EGUs such as Colstrip are facing a constellation of economic forces separate from the CPP that render them less competitive with each passing year.

76. In fact, NWE itself, which owns a share in Unit 4, apparently believes that Units 1 and 2 have zero—or even negative—value. In January 2013, NWE offered to buy all of the assets of another generator, PPL Corporation, including PPL's interest in Units 1, 2, and 3. NWE submitted two bids to PPL, offering $400 million for *all* of PPL's assets (including PPL's share of the Colstrip units), and one for $740 million for *only* PPL's hydropower units.[86] In other words, NWE considered Colstrip Units 1, 2, and 3 to have a

[84] *See* Montana Dep't of Envtl. Quality, *Colstrip Update* (Oct. 2015), at 3, *available at* http://www.deq.mt.gov/MFS/ColstripSteamElectricStation/Colstrip%20deq/Colstrip/FactSheetOct2015.pdf.

[85] *Sierra Club v. PPL Montana LLC*, Dkt. No,. 13-cv-00032 (D. Mont. Mar. 6, 2013), *available at* http://www.scribd.com/doc/129002674/13-3-6-Filed-Complaint.

[86] NWE, Application for Approval to Purchase and Operate PPL Montana's Hydroelectric Facilities, for Approval of Inclusion of Generation Asset Cost of Service in Electricity Supply Rates, for Approval of Issuance of Securities to Complete the Purchase, and for Related Relief, Docket No. D2013.12.85, before the Montana Public Service Comm'n

negative value of approximately $340 million. NWE ultimately purchased PPL's hydropower assets but not its interests in Colstrip Units 1, 2, and 3.

77. A merchant company, Talen Energy, later acquired PPL's entire share of Colstrip. The declining value of these assets is apparent from the fact that PPL had been writing off Units 1 and 2 in recent years prior to their sale, as well as writing down their total taxable value since 2013 by 67 percent.[87] The taxes Talen pays to state and local governments on these units have likewise declined significantly in recent years.[88] If Colstrip 1 and 2 do close in 2022, it will be due to factors that predate, and are unrelated to, the Clean Power Plan.

78. As for Units 3 and 4, NWE merely asserts that they would retire in 2022 under a rate-based CPP program. However, under the CPP's mass-based compliance pathway, Montana's average annual emissions goal for the years 2022-2024 is 13,776,601 tons of CO_2 per year. As indicated above, Colstrip 1 and 2 may well retire for reasons unrelated to the CPP before 2022—indeed, policymakers in Washington State and Montana are already exploring this option.[89] Furthermore, Montana's J.E. Corette coal

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(Dec. 2013), at BBB-7, *available at* http://www.northwesternenergy.com/docs/default-source/documents/hydro/application/docket-no-d2013-12-85-approval-to-purchase-hydro-e-file.pdf.

[87] Montana Dep't of Revenue, Memorandum from Rose Bender to Director Kadas Re: Colstrip Units 1 and 2 Analysis (Sept. 1, 2015), at 2.

[88] *Id.*

[89] *Officials discuss future of Colstrip power plants*, Billings Gazette/Associated Press (Oct. 28, 2015), *available at* http://billingsgazette.com/news/state-and-regional/montana/officials-discuss-future-of-colstrip-power-plants/article_71b52592-f025-5bc2-9cc2-88bcdab875f0.html; *see also* Mike Dennison, *Washington state may play critical role in future of Colstrip power plants*, KRTV.com (Dec. 4, 2015), *available at*

plant shut down permanently in August 2015.[90] According to EPA's data, the state's remaining regulated units (including Colstrip 3 and 4) emitted 13,713,208 tons of CO_2 in 2012. If Colstrip 1 and 2 do indeed retire by 2022, the state's EGUs can therefore operate at historical levels through 2024 and satisfy Montana's Clean Power Plan goals; no other compliance measures would be needed. There is no basis to the assertion that the Clean Power Plan will force the near-term retirement of Colstrip 3 and 4.

79. Given its unreliable operating history, it is also plausible that Unit 4 will not run at full capacity for significant stretches of time during the compliance period. In the last six years, this unit was not operating for approximately 12 months because of two extended, unplanned outages.[91] The President and CEO of Talen Energy has made clear that the company has no plans at this time to make the investments needed to avoid some plant outages in the future: "We've seen a few unplanned outages at Colstrip

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http://www.krtv.com/story/30671627/washington-state-may-play-critical-role-in-future-of-colstrip-power-plants.

[90] Tom Lutey, *Crews begin dismantling J.E. Corette power plant*, Billings Gazette (Aug. 3, 2015), *available at* http://billingsgazette.com/news/local/crews-begin-dismantling-j-e-corette-power-plant/article_53bd0a75-59c3-54a7-b2f7-084d751cadcd.html.

[91] *Wash. Util. and Transp. Comm'n v. Puget Sound Energy, Inc.*, Dkt. Nos. UE-111048 and UG-111049 before the Wash. Utils. and Transp. Comm'n, Prefiled Direct Testimony (Confidential) of Michael L. Jones on Behalf of Puget Sound Energy, Inc.- Redacted Version (June 13, 2011) at 5:14—6:10 (discussing five-month forced outage in 2009), *available at* http://www.wutc.wa.gov/rms2.nsf/177d98baa5918c7388256a550064a61e/fb14b4e61387a425882578af005ff244; Mike Dennison, *PSC deciding who should pay costs of Colstrip plant outage* , KPAX News (Oct. 6, 2015) (describing seven-month outage in 2013-14), *available at* http://www.kpax.com/story/30200756/psc-deciding-whether-nw-energy-or-consumers-should-pay-costs-of-colstrip-plant-outage.

primarily for boiler tube leaks, but market price signals in the West don't support proactively putting capital into the units at this time."[92]

80. Another example of misleading testimony is the declaration submitted by representatives of Alabama Power Company. This declaration asserts that the company will be required to prematurely shutter more than 2,600 MW of its fossil fuel-fired generating capacity under the Clean Power Plan, leading to negative impacts on reserves, transmission, fuel contracts, and property tax revenues.[93] These claims are disingenuous. Of the 14 units the Alabama Power declaration claims will retire due to the Clean Power Plan, ten will convert or have already converted to natural gas on account of decisions made prior to the rule's finalization, while the other four are shown to retire in 2016 regardless of the Clean Power Plan, under EPA's base case (i.e., "business as usual") modeling run.

81. Before the Clean Power Plan was proposed, Alabama Power decided to convert six of the units discussed in the declaration (Gaston Units 1–4 and Gadsden Units 1–2) to natural gas; these conversions will occur by 2016.[94] In addition, under an August 2015 settlement agreement with EPA pursuant to a Clean Air Act lawsuit against the company, Alabama Power agreed to burn only natural gas at Barry Units 1 and 2 no later than October 23, 2015

[92] Talen Energ Corp., edited transcript of Talen Energy earnings conference call for Q3, 2015 (Nov, 5, 2015), *available at* https://beta.finance.yahoo.com/news/edited-transcript-tln-earnings-conference-180852200.html?ltr=1.

[93] *See* UARG Stay Motion, Heilbron Decl.

[94] *Eye on EPA, Alabama Power to convert four coal units to gas*, Electric Power Daily, Platts (Apr. 25, 2012).

and at Greene County Units 1 and 2 no later than January 1, 2017.[95] In fact, Barry Units 1 and 2 already ceased burning coal in April 2015 and will remain available on a limited basis with natural gas as the fuel source.[96] Furthermore, Mississippi Power (like Alabama Power, a subsidiary of Southern Company and part owner of these units) already agreed to cease burning coal at Green County Units 1 and 2 by April 2016 pursuant to a settlement agreement with Sierra Club negotiated in August 2014.[97]

82. As for the remaining units cited in its declaration—Gorgas units 8, 9, and 10 and Barry Unit 4—Alabama Power fails to mention that EPA's IPM modeling shows these units as retiring in 2016 under what is called a "base-case scenario."[98] In the IPM platform, a "base case" simply models what would occur in the power market in the absence of the regulation being analyzed (in this case, the CPP) (*see* Burtraw Decl. ¶¶ 28–35). Because Gorgas 8–10 and Barry 4 retire under its base-case scenario, Alabama Power's declarant is wrong to state that the model represents these units as retiring in 2016 because of the CPP—on the contrary, it shows them as retiring *anyway* in that year, regardless of EPA's rule.

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[95] *United States v. Alabama Envtl. Council*, Order Modifying Consent Decree at 8-9, No. 2:01-cv-00152-VEH, ECF No. 400 (N.D. Ala. Aug. 24, 2015); *see also* Dennis Pillion, *Alabama Power agrees to shutter 3 coal-fired units, convert 4 others to natural gas in EPA deal*, AL.com (June 25, 2015).

[96] *See* Alabama Power Company, SEC Form 10-Q, filed Nov. 5, 2015, at 27.

[97] *Id.; see also* Jack Elliott Jr., *Mississippi Power And Sierra Club Settle Litigation Over Coal Plant Construction*, Associated Press (Aug. 4, 2014), http://www.huffingtonpost.com/2014/08/04/mississippi-power-sierra-club-litigation_n_5648349.html.

[98] *See* Schwartz Decl., *supra* n. 37, Ex. 31 (listing base-case retirement year as 2016 for Gorgas 8-10 and Barry 4).

83. Table 1 below summarizes the status and generation capacity of the units discussed in Alabama Power's declaration.

Table 1: Status of Alabama Power Coal Plants Discussed in Declaration

Unit	Capacity (MW)	2014 Capacity Factor[99]	Actual Status
Barry 1	138	1.6	Ceased burning coal in April 2015, will remain available on a limited basis with natural gas as the fuel source.
Barry 2	137	1.5	Ceased burning coal in April 2015, will remain available on a limited basis with natural gas as the fuel source.
Barry 4	362	43.4	Retires under EPA's base-case scenario.
Greene County 1	254	54.5	Required to cease burning coal by April 2016; must operate solely on natural gas thereafter.
Greene County 2	243	72.6	Required to cease burning coal by April 2016; must operate solely on natural gas thereafter.
Gorgas 8	161	35.8	Retires under EPA's base-case scenario.
Gorgas 9	170	26.8	Retires under EPA's base-case scenario.
Gorgas 10	703	69.2	Retires under EPA's base-case scenario.
Gadsden 1	64	25.7	Converting to natural gas.
Gadsden 2	66	12.6	Converting to natural gas.
Gaston 1	254	22.2	Converting to natural gas.
Gaston 2	256	19.1	Converting to natural gas.
Gaston 3	254	31.9	Converting to natural gas.
Gaston 4	256	42.5	Converting to natural gas.

[99] Capacity factor was calculated using summer capacity (MW) data and net generation (MWh) data from Form-EIA 860 and Form-EIA 923 for the year 2014.

84. Many of the remaining units that petitioners' declarants claim will be affected by the Clean Power Plan are likely to face serious economic pressure in the near term for specific reasons other than the Clean Power Plan; some have already succumbed to that pressure. For example:

- Plant Watson (discussed in the Reaves[100] declaration): Mississippi Power announced in 2014 that it would cease burning coal at Watson Units 4 and 5 by April 2015,[101] well before the final Clean Power Plan was issued.

- Naughton Power Plant (discussed in the Schwartz[102] and Cottrell[103] declarations): Naughton Unit 3 is expected to convert to natural gas in 2018;[104]

- Conesville Power Plant (discussed in the Schwartz[105] and Cottrell[106] declarations): Conesville is now so uneconomical to operate that its owner, AEP, is seeking approval from the Ohio Public Utilities Commission for a bailout package for this and other coal plants.[107]

- Laramie River Station (discussed in the Raatz[108] declaration): This high-emitting facility is expected to need investment in pollution

[100] UARG Stay Motion, Reaves Decl. ¶ 13.
[101] *Final coal barge arrives at Plant Watson*, Hattiesburg American (Feb. 25, 2015), *available at* http://www.hattiesburgamerican.com/story/news/2015/02/25/final-coal-barge-arrives-at-plant-watson/24015347/.
[102] Schwartz Decl., *supra* n. 37, ¶ 38.
[103] NMA Stay Motion, Cottrell Decl. ¶ 9.
[104] Pacific Power, Press Release, PacifiCorp Long Range Energy Plan Calls for Less Coal, More Energy Efficiency (June 08, 2015), *available at* https://www.pacificpower.net/about/nr/nr2015/irp-energy-plan.html.
[105] Schwartz Decl., *supra* n. 37, ¶ 38.
[106] Cottrell Decl., *supra* n. 103, ¶ 8.
[107] Cathy Kunkel, IEEFA, *Briefing Note: West Virginia Bailout Emboldens FirstEnergy and AEP in Ohio* (Oct. 2015), at 3–4, 7–8, *available at* http://ieefa.org/wp-content/uploads/2015/10/West-Virginia-Bailout-Emboldens-FirstEnergy-and-AEP-in-Ohio-October-2015.pdf.
[108] Stay Motion of Basin Electric Power Cooperative, Raatz Decl. ¶ 21.

controls to comply with EPA's anticipated Regional Haze FIP for Wyoming.[109]

- Bonanza Power Plant (discussed in Rasmussen[110] declaration): As part of a proposed settlement agreement with EPA and environmental groups that is now open for public comment, Deseret Electric Power Cooperative would have to install pollution controls at Bonanza and limit that unit's coal consumption, which may result in early retirement.[111]

- Mill Creek Generating Station (discussed in Murray[112] declaration): This plant is currently the subject of a citizen lawsuit for violations of the Clean Air Act,[113] and Mill Creek Unit 1 will soon face compliance obligations under EPA's 316(b) rule regulating cooling water intake structures.[114]

- Plant Hammond (discussed in Pemberton[115] declaration): As noted previously, Hammond is already struggling to compete financially and will likely have to install cooling towers as part of a recent settlement agreement.

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[109] Basin Electric Power Cooperative, Press Release, Parallel paths will determine Laramie River's future (June 13, 2014), *available at* http://www.basinelectric.com/News-Center/News-Articles/News-Briefs/parallel-paths-will-determine-laramie-rivers-future.html.

[110] UARG Stay Motion, Rasmussen Decl. ¶¶ 6–10.

[111] Robert Walton, *Settlement could spell early retirement for Utah coal plant*, Utility Dive (Oct. 8, 2015), *available at* http://www.utilitydive.com/news/settlement-could-spell-early-retirement-for-utah-coal-plant/406974/; *see also* 80 Fed. Reg. 63,993 (Oct. 22, 2015) (requesting public comment on terms of settlement agreement).

[112] NMA Stay Motion, Murray Decl. ¶ 38.

[113] *Sierra Club v. Louisville Gas and Electric Co.*, Civil Action No. 3:14-CV-391-DJH., Complaint, Dkt. No. 1 (W.D. Ky. May 28, 2014), *available at* http://www.kentucky.com/news/article43398099.ece/BINARY/Mill%20Creek%20complaint.

[114] PPL, et al., SEC Form 10-Q for the Quarterly Period Ended March 31, 2015 (filed May 7, 015), *available at* http://www.streetinsider.com/dr/news.php?id=10534388.

[115] UARG Stay Motion, Pemberton Decl. ¶ 13.

85. As these examples show, petitioners' declarants tell a story of coal-fired generation throughout the country that does not stand up to the facts. These units are already retiring or re-powering to other fuel sources, and are doing so because of factors other than the Clean Power Plan.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 7th day of December, 2015

David Schlissel

Biography of David A. Schlissel
Director of Resource Planning Analysis
Institute for Energy Economics and Financial Analysis

David Schlissel is the Director of Resource Planning Analysis for the Institute for Energy Economics and Financial Analysis. He has served as a consultant, expert witness, and attorney since 1974 on financial, economic and engineering issues in the fields of energy and the environment. This work has involved preparing financial and economic analyses, conducting technical investigations and drafting reports and expert testimony.

Mr. Schlissel's work in recent years has focused in large part on preparing analyses of the following: the financial viability of retrofitting versus retiring operating power plants; wholesale energy and capacity market prices; the relative economics of renewable resources; the risks associated with investments in proposed fossil-fired power plants and their alternatives; electric grid reliability; and the evaluation of utility resource plans.

Mr. Schlissel's clients have included state utility regulatory commissions in Arkansas, Kansas, New Mexico, Arizona, Maine and California, publicly-owned utilities, non-utility generators, power plant equipment suppliers, state attorneys general and consumer advocates and environmental groups. He has presented testimony on issues related to electric utilities in more than 165 cases before regulatory boards and commissions in 38 states, two federal regulatory agencies, and in state and federal court proceedings. He also was the lead author for a number of reports including *When, Not If: Bridgeport's Future and the Closing of PSEG's Coal Plant; Mountain State Maneuver, AEP and FirstEnergy Try to Stick Ratepayers with Risky Coal Plants; Public Utility Regulation without the Public: The Alabama Public Service Commission and Alabama* Power; *Dark Days Ahead: Financial Factors Cloud the Future Profitability at Dominion Resource's Brayton Point Power Plant*; and *Don't Get Burned: The Risks of Investing in New Coal Plants.*

Mr. Schlissel holds BS and MS degrees in Astronautical Engineering from the Massachusetts Institute of Technology and Stanford University. He also received a Juris Doctor degree from Stanford University School of Law. In addition, he studied Nuclear Engineering and Project Management at MIT.

Copies of Mr. Schlissel's public reports, presentations and expert testimony are available at www.ieefa.org and www.schlissel-technical.com.

IN THE
UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF WEST VIRGINIA, STATE OF TEXAS, *et al.,* Petitioners, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.* Respondents.	Case Nos. 15-1363 (and consolidated cases)

DECLARATION OF LARRY R. SOWARD, FORMER COMMISSIONER, TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

I, Larry R. Soward, declare as follows:

Background.

1. I am a former Commissioner of the Texas Commission on Environmental Quality ("TCEQ"). I was appointed by former Texas Governor Rick Perry to serve as Commissioner on October 20, 2003 and served on the TCEQ through August 31, 2009. While a TCEQ Commissioner, I was appointed by Governor Perry to serve on the Texas Energy Planning Council, a 22-member body charged with developing an energy plan for the State. I also served as Executive Director of the Texas Water Commission, a predecessor to the TCEQ, as well as its Chief Hearings Examiner and General Counsel. I also served as the Deputy

Executive of the Public Utility Commission of Texas ("PUCT") from November 1990 to November 1992.

2. The TCEQ is one of the largest environmental agencies in the United States, and is the Texas state agency with primary authority for implementing and enforcing air quality planning and permitting, water quality, water supply, water availability, remediation, municipal solid waste, radioactive waste, and hazardous waste programs in the State of Texas. The TCEQ also has been delegated the authority to administer every major federal environmental program in Texas including key portions of the federal Clean Air Act ("CAA"). As a result, TCEQ is responsible for implementing and enforcing most CAA requirements in Texas, subject to oversight by the U.S. Environmental Protection Agency ("EPA").

3. In the air quality context, as one of the three TCEQ Commissioners, I was responsible for: developing, adopting and implementing Texas State Implementation Plans for attainment of the National Ambient Air Quality Standards; air quality planning; setting air quality policy and adopting air quality regulations in Texas; implementing state and federal environmental regulatory laws by issuing permits and authorizations for the control of air pollution; and ensuring compliance with state and federal environmental laws and regulations by adopting enforcement orders, assessing administrative penalties and taking formal enforcement action against suspected violators.

4. As a TCEQ Commissioner, I presided over numerous regulatory and policy decisions relating to the development, enactment, implementation and/or enforcement of air quality standards, regulations, plans, control measures and

strategies in Texas. These responsibilities included approving any revisions to the State Implementation Plan required under §110 of the federal CAA in order to demonstrate attainment and maintenance of federally promulgated National Ambient Air Quality Standards.

5. As Deputy Executive Director of the PUCT, I was responsible for assisting the Executive Director in coordinating and managing all administrative activities of the PUCT, including: developing policy recommendations to the Commissioners and formulating staff procedures to implement policy as established by the Commissioners; and providing advice to the Commissioners on administrative and regulatory issues. In this capacity, I had a general working knowledge of regulatory issues relating to electric generation, transmission and distribution within Texas, as well as the associated operations of the Electric Reliability Council of Texas ("ERCOT"), the electric grid operator covering 90% of the state, and other electric utility grids in the state.

6. Since my term as a TCEQ Commissioner expired in August 2009, I have been an independent consultant providing consulting services to a variety of clients on environmental, regulatory, and legislative related matters. These consulting services have focused significantly on air quality issues in Texas.

7. In preparing this Declaration, I have reviewed numerous documents, reports and on-line databases including but not limited to: (a) the U.S. Environmental Protection Agency's ("EPA") final rule titled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" dated August 3, 2015 (the "Clean Power Plan" or "CPP"); (b) various EPA guidance documents

related to CPP implementation; (c) numerous reports prepared by ERCOT including "ERCOT Analysis of the Impacts of the Clean Power Plan." ("ERCOT CPP Report");[1] (d) TCEQ on-line databases related to permits issued by TCEQ, and pending permit applications, for natural gas-fired power plants; (e) Energy Information Agency on-line databases related to natural gas production in Texas and volumes of vented and flared natural gas; (f) the Motion to Stay filed by Petitioners State of West Virginia, *et al* ("Petitioners"); and (g) the respective Declarations of Richard A. Hyde, P.E., Executive Director of the Texas Commission on Environmental Quality ("Hyde Declaration") and Brian H. Lloyd, Executive Director, Public Utility Commission of Texas ("Lloyd Declaration") attached to Petitioners' motion.

8. My opinions in this declaration are informed by over 40 years of environmental and environmental regulatory and policy work and experiences, specifically including my roles, duties and responsibilities as a Commissioner of the TCEQ; my review, observations and understandings of on-going state and federal regulatory policies, programs and initiatives relating to air quality issues in Texas; my review and analysis of the above-referenced reports, documents, and databases; and my review, observations and understandings of issues associated with the development, implementation and compliance of the CPP in Texas. Accordingly, I

[1] ERCOT, *ERCOT Analysis of the Impacts of the Clean Power Plan* (Oct. 16, 2015), http://www.ercot.com/content/news/presentations/2015/ERCOT_Analysis_of_the_Impacts_of_the_Clean_Power_Plan-Final_.pdf

have personal knowledge of and the experience to understand what steps Texas would need to take to develop its State Plan in response to the CPP.

The CPP Provides a Flexible Framework for Implementation and Will Not Impose "Unprecedented" Burdens on Texas Agencies during the Stay Timeframe or Beyond.

9. In their Declarations, Mr. Hyde and Mr. Lloyd contend that the CPP will "require unprecedented coordination" between the TCEQ, the Governor of Texas, the PUCT, and other stakeholders.[2] Mr. Hyde and Mr. Lloyd each contend that compliance with the CPP will require excessive expenditures of time and resources and will irreparably harm the State of Texas.[3] These claims are overstated.

10. The CPP gives Texas significant flexibility to implement control measures and strategies necessary to reduce carbon dioxide emissions from existing coal-fired and natural gas-fired power plants by 2030. The State may either apply carbon dioxide emission standards directly to its existing power plants, or establish a single state-wide emission target for its power plants that could be achieved through a combination of emission standards and other complementary policies. If the State adopts emission standards to comply with the CPP, it may select either a rate-based or mass-based carbon dioxide limit and may authorize a flexible framework for achieving compliance with that limit, including trading of emission allowances or credits. Under either a rate-based or mass-based framework, the CPP allows electric generators the flexibility to select from a wide variety of options to comply.

[2] Hyde Declaration at ¶8; Lloyd Declaration at ¶83.

[3] Hyde Declaration at ¶36; Lloyd Declaration at ¶86.

11. The CPP also provides optional tools that Texas can use to minimize costs through trading of compliance instruments with other states. For example, EPA has proposed "trading-ready" model rules for both mass and rate-based emission standards. If Texas were to adopt one of the model rules, electric generators within Texas would be able to trade with sources in any other state with a comparable program.

12. Texas also has the option to accept implementation of a Federal Plan to comply with the CPP if it is unable to timely submit a State Plan, or chooses not to do so. If Texas does become subject to a Federal Plan, it would still retain the authority to submit a State Plan at any time – even after the compliance period for the CPP begins. This aspect of the CPP reflects the familiar cooperative federalism approach employed in numerous programs under the CAA, under which the State of Texas has the prerogative to directly implement CAA programs, but is not required to do so.

13. If Texas is unable to develop, complete and submit a final State Plan by September 2016, the CPP gives Texas the flexibility to request a two-year extension, thus giving the State until at least September 2018 to finalize and submit its State Plan.

14. The process for requesting an extension under the CPP requires only the following:

- Identification of the final plan approach or approaches being considered by the state and description of progress made to date on the final plan components;
- An explanation of why the state requires additional time to submit a final plan; and

- A demonstration or description of the opportunities for public comment and meaningful stakeholder engagement provided during the initial submittal and plans for public engagement during development of the final plan.[4]

15. As these criteria suggest, the request for extension does not require the State to make any binding or irreversible decisions as to the form of the final State Plan. Nor do the straightforward, minimal showings required as part of the request for extension entail a substantial investment of state effort or resources.

16. Despite assertions to the contrary in the Hyde and Lloyd Declarations submitted by Petitioner State of Texas, Texas has sufficient time to submit a request for extension by the September 2016 deadline and a State Plan by the September 2018 deadline.

17. Texas has a range of options for compliance with the CPP that it can consider and evaluate as part of its normal planning processes. Texas always retains the option of not developing a State Plan and instead participating in a Federal Plan. Although the EPA's proposed rule for a Federal Plan is in the comment stage and will not be finalized until Summer of 2016, Texas reasonably knows key elements of what the final Federal Plan will likely include and/or require, and can certainly properly evaluate such a plan's likely effects. For example, Texas already knows that the proposed Federal Plan would implement an emissions trading system in order to meet

[4] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64,661, 64,856 (Oct. 23, 2015).

statewide emissions levels.[5] To the extent (if any) that Texas is not yet fully aware of the requirements of a Federal Plan, it will have two years (between Summer 2016 and September 2018) to compare the final Federal Plan and the final CPP and determine whether it is better for Texas to develop a State Plan or take the Federal Plan.

18. I have seen the EPA propose and finalize numerous national environmental standards and accompanying regulations over my professional career. I have participated in the development of responsive plans and efforts at the state level. On the basis of my professional experience, and despite assertions to the contrary asserted in the Hyde and Lloyd Declarations, the CPP's requirements are not any more complex or "unprecedented" than other federal regulations and standards Texas has faced in implementing many other national air quality standards and/or regulations.

19. Texas' State Implementation Plans implementing the National Ambient Air Quality Standards, for example, require the State to establish emission limitations and undertake other emission-reducing measures for a much broader and more diverse suite of emission sources than existing power plants, and must be accompanied by complex modeling demonstrating those measures will achieve the air quality standards. The CAA provides a three-year deadline for submitting such plans,[6]

[5] Federal Plan Requirements for Greenhouse Gas Emissions from Electric Utility Generating Units Constructed on or before January 8, 2014, Model Trading Rules; Amendments to Framework Regulations, 80 Fed. Reg. 64,965 (Oct. 23, 2015).

[6] Sec. 110(a)(1) (3-year deadline for submission of infrastructure State Implementation Plan), Sec. 172(b) (3-year deadline from designation of nonattainment status for submission of State Implementation Plan).

consistent with the timeframe provided under the CPP. To further illustrate the feasibility of the planning process, Texas adopted a State Implementation Plan in 2006 under EPA's Clean Air Interstate Rule that established a mass-based emissions trading system for nitrogen oxides and sulfur dioxide from the State's power plants. This rule was adopted by the State approximately fourteen months after the promulgation of the Clean Air Interstate Rule. At the State's option, the CPP could be implemented through a plan that likewise adopts an overall state emissions budget and mass-based emissions trading system. [7] The actions, control measures and strategies needed to be adopted and/or implemented are no more complex and unprecedented than would be required for almost any other State Implementation Plan.

20. The coordination anticipated among the TCEQ, the Governor, the PUCT, the entities with responsibilities concerning electric generation, transmission, and distribution within Texas (including ERCOT), the State Energy Conservation Office, the Railroad Commission of Texas, lawmakers, and stakeholders, including owners and operators of affected units, local government officials and the public, is also no more complex and unprecedented than would be required for almost any other State Implementation Plan. In my experience these entities are—very appropriately—in regular communication on matters related to the oversight of Texas' electricity system.

21. Based on my personal knowledge and experience with the EPA's

[7] TCEQ, *Revisions to the State Implementation Plan (SIP) for Electric Generating Units Statewide to Reduce Fine Particulate Matter of 2.5 Microns and Less ($PM_{2.5}$) Transport Emissions* ii (2010) (noting TCEQ adopted the initial Clean Air Interstate Rule State Implementation Plan revision on July 12, 2006). The Clean Air Interstate Rule was promulgated in May 2005.

adoption of national air quality standards, it is not uncommon or unprecedented for the EPA to set compliance deadlines that require the TCEQ, local governments, regulated entities, stakeholders and the public to respond to, comply with, and/or demonstrate compliance in the same timeframes provided in the CPP.

22. In my experience, the TCEQ is routinely accustomed to working with strict deadlines, especially as related to the development and submission of State Implementation Plans. It was routine practice during my tenure as Commissioner, and still is, based on my personal observations and experiences since then, for the TCEQ to allocate and/or re-allocate resources as necessary or appropriate to accomplish required work in the timeframes allowed. Implementing federal environmental law is a large part of what the TCEQ does.

23. Based on my personal knowledge and experience with State Implementation Plans in Texas, it is not uncommon for the EPA to establish supporting guidelines well after its adoption of a national air quality standard. Likewise, it is not uncommon for the TCEQ to have to proceed to develop, adopt and implement necessary State Implementation Plans to address national air standards before, or while, associated guidance is being established by the EPA.

24. Based on my personal knowledge and experience, I know that the TCEQ has existing programs in place, primarily the Air Quality Assessment and Planning Program, whose primary role and responsibilities fully encompass the work required to develop a State Plan to comply with the CPP. If the State chooses to develop its own plan versus accepting a Federal Plan, this capacity is well placed to support any efforts to develop and implement a state program.

25. The Air Quality Assessment and Planning Program, along with other supporting programs in the TCEQ, has adequate staff and budgetary resources allocated to it which, if reasonably and timely allocated, can perform the work required to develop a request for extension within the timeframe available to the TCEQ. In my experience, any minimal expectations required as part of the request for extension could be fulfilled by properly allocating these existing staff time and resources. For example, the necessary "demonstration or description of the opportunities for public comment and meaningful stakeholder engagement provided during the initial submittal and plans for public engagement during development of the final plan" does not demand any specific requirements beyond public meetings, stakeholder meetings, and other forms of public engagement that the TCEQ already engages in as a matter of course.

26. These resources and staff are similarly sufficient to assure that TCEQ can perform the work required to develop a State Plan for the CPP within the timeframe available to the TCEQ. For the fiscal 2016-2017 biennium, the Air Quality Assessment and Planning Program alone has over $412 million and over 330 employees appropriated to it by the Texas Legislature to carry out just the kind of work required to develop a State Plan for the CPP.[8] For air quality compliance and planning purposes, TCEQ has more than 1,200 stationary air monitors at more than 200 sites in Texas, and can deploy mobile monitoring as needed. Using this and other modeling information, TCEQ routinely assesses Texas' air quality and develops

[8] Tex. H.B. 1, 84th Leg., R.S. (2015), Article VI; Page VI-14; TCEQ, *Legislative Appropriations Request For Fiscal Years 2016 and 2017* (Aug. 18, 2014) at Strategy 3.A. Request, p. 4 of 80.

strategies to maintain and improve it. Where federal requirements are accompanied by no additional federal funds or reduced federal funds, the TCEQ certainly may, and has in the past, reallocate funds from other air quality programs as appropriate. The agency is also expressly authorized to contract with others as necessary to carry out its responsibilities.

Texas Is Well Positioned to Meet CPP Requirements Due to Existing Energy Market Trends and Ample In-State Clean Energy Resources

27. Texas is well positioned to meet CPP requirements under current market trends and will not require significant state legislation. Furthermore, even if legislation at the state level is required, the Texas legislative process poses no significant obstacles to CPP implementation.

28. Mr. Lloyd claims that the Rule "represents a severe intrusion into" Texas electricity markets, and further suggests that these changes will compromise the reliability of Texas' power grids.[9] Similarly, Mr. Hyde claims that "in order to achieve the final emission performance goals, Texas will be required to make fundamental changes in its energy policy to force shifts in the generation of electricity from coal-fired power plants to NGCC and carbon-neutral generation resources."[10] Given that Texas and its major energy producers are already moving substantially in the direction of less carbon-intensive generation, in my opinion these claims are overstated.

29. Texas' energy mix is already moving closer to the CPP's goals. These

[9] Lloyd Declaration at ¶ 31.

[10] Hyde Declaration at ¶26.

existing trends leave Texas well-positioned to meet its carbon dioxide targets without the kind of complex, onerous efforts described in the Hyde and Lloyd declarations. Natural gas and renewables are increasingly important power sources in Texas, and the use of coal is already declining due to market drivers and not as a result of the CPP. Last year, approximately 65% of Texas' power came from sources other than coal, primarily natural gas.[11] Since mid-2014, ERCOT has added more than 6,095 MW of natural gas capacity and 8,886 MW of renewable capacity to its reserve reports, and moved over 3,120 MW of new gas generation and over 4,142 MW of new renewable generation to "Operational Status."[12] In addition, applications for some or all of the necessary air quality permits are currently pending for additional gas-fired power plants with a collective incremental generation capacity of approximately 10,000 MW.[13] Natural gas is a readily available, homegrown fuel

[11] Energy Information Administration. "State Historical Data Tables for 2014." October, 2015; http://www.eia.gov/electricity/data/state/annual_generation_state.xls

[12] ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region* (Dec. 1, 2014) at 6-7, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-Dec2014.pdf;

ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,(*May 4, 2015) at 5, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-May2015.pdf;

ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,*(Dec. 1, 2015) at 5-6, http://www.ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-December2015.pdf.

[13] TCEQ computer printout, "Gas Turbines Rated 20 MW and Greater Electric Output, Pending Air NSR Permits for Criteria Pollutants or for GHG Pollutants," (Nov. 9, 2015) (copy in Declarant's possession).

source: Texas has more natural gas reserves than any other state and natural gas production has increased by more than 14% since 2010.[14] There is also significant unused natural gas supply available in Texas. Since 2010, the amount of natural gas being vented or flared annually in Texas (and therefore not delivered to market) has more than doubled to 80 billion cubic feet.[15]

30. Texas is also the nation's leading state for producing power from wind, and ranks first nationally for solar energy potential.[16] Moreover, Texas' wind and solar energy potentials are many times greater than current capacities online. Generation from wind and solar facilities is projected to grow significantly in the next 10 years.[17] Increasing these wind and solar sources from current levels will certainly facilitate the State in meeting the carbon emissions targets. Texas has more Combined Heat and Power (CHP) potential than any other state, in large part related to its extensive refining and petrochemical sectors.[18] Furthermore, Texas has significant potential to deploy more energy efficiency and other energy management programs than currently

[14] U.S. Energy Information Administration, "Natural Gas Withdrawals and Production (Gross Withdrawals-Texas)" http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm

[15] U.S. Energy Information Administration, "Natural Gas Withdrawals and Production (Vented and Flared-Texas)" http://www.eia.gov/dnav/ng/ng_prod_sum_a_epg0_vgv_mmcf_a.htm

[16] National Renewable Energy Laboratory (NREL), "Renewable Electricity Futures Study." 2012. See http://www.nrel.gov/analysis/re_futures/.

[17] *Id.*; *see also* ERCOT, "Generator Interconnection Status Report: June 2015." (July, 2015); http://www.ercot.com/content/gridinfo/resource/2015/generation/GIS_REPORT_June_2015_REVISED.xls; *see also* ERCOT, "2014 LTSA Scenario Results Update." (Oct. 2014).

[18] The Brattle Group. "Exploring Natural Gas and Renewables in ERCOT, Part III: The Role of Demand Response, Energy Efficiency, and Combined Heat & Power." (May 2014). http://www.texascleanenergy.org/Brattle%20III%20Final.pdf.

in place.

31. Importantly, ERCOT's own various projections as to current and future electric generation fuel mixes indicate that under business-as-usual, Texas is already likely to achieve 88% of the CPP's 2030 compliance goal and full compliance with the 2022-2029 interim target.[19] Some other projections reasonably indicate that the 12% compliance gap can be filled through energy efficiency measures already in place in the State along with efficiency levels projected to be achievable in the next 10 years.[20]

32. The CPP gives states broad discretion in how to achieve its goals by providing a framework that will facilitate adoption of a market-based approach to achieving reductions, allowing market economics to decide the best mix of generation resources to achieve the goal. To this end, I have seen numerous positive comments from some of the largest electric generating companies in Texas regarding their ability to comply with the CPP by the deadlines prescribed. Those comments reflect the companies' differing business strategies, their diverse fuel mixes today and their varied plans for the relative amounts of coal, natural gas, renewable and nuclear generation they may use in the future. For example, Houston-based Calpine supports the CPP, predicting the "emissions reductions will be realized in a manner that ensures continued affordable and reliable electricity."[21] Municipally-owned Austin Energy

[19] Environmental Defense Fund, *Well Within Reach: How Texas Can Comply with and Benefit from the Clean Power Plan* at 18, http://www.edf.org/sites/default/files/content/cpp-texas_report.pdf.

[20] *Id.*

[21] Press Release, Calpine, Calpine Supports EPA Clean Power Plan (Aug. 3, 2015); http://investor.calpine.com/investor-relations/news-releases/news-release-details/2015/Calpine-Supports-EPA-Clean-Power-Plan/default.aspx.

reiterated its commitment to energy-efficiency measures, renewables and carbon-free nuclear power, noting its schedule to get 55% of its power by 2025 from renewable sources, and a large part of the remainder from an existing nuclear plant.[22] It also has launched a plan to begin retiring its largest carbon dioxide producer, the Fayette County coal-fired plant, in 2022.[23] San Antonio utility CPS Energy has been implementing a strategy of retiring coal plants years ahead of schedule and adding lower-carbon dioxide natural gas and carbon dioxide-free wind and solar to its generation mix, thus allowing it to help meet the CPP's overall goal for Texas. CPS Energy noted its belief that "with the best market structure, low energy costs, and vast renewable and natural gas resources, Texas is uniquely positioned."[24]

33. In my opinion, it is likely that legislation will not be required to enable the TCEQ to develop and adopt an approvable State Plan. The TCEQ has adequate statutory authority currently to require the emission reductions necessary to meet the state emission performance goal, monitor compliance, enforce each component of the State Plan, and provide required reports to the EPA. Current state law requires the TCEQ to "establish the level of quality to be maintained in the state's air and control

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[22] Press Release, Austin Energy, Austin Energy Response to Release of the Clean Power Plan (Aug. 3, 2015), http://austinenergy.com/wps/portal/ae/about/news/press-releases/2015/austin-energy-response-to-release-of-the-clean-power-plan.

[23] *Id.*

[24] Press Release, CPS Energy, CPS Energy CEO Responds to Final Clean Power Plan (Aug. 3, 2015), http://newsroom.cpsenergy.com/cps-energy-ceo-responds-to-final-clean-power-plan/; http://newsroom.cpsenergy.com/diverse-portfolio-pays/

the quality of the state's air," and gives the Commission all "powers necessary or convenient to carry out its responsibilities." Tex. Health & Safety Code Ann. §382.011. The TCEQ is authorized to adopt rules, consistent with applicable federal law, to control air contaminants as necessary to protect against adverse effects related to climatic changes, including global warming; and to issue permits authorizing greenhouse gas emissions, expressly including carbon dioxide, and to prepare and submit appropriate federal program revisions to the EPA for approval. Tex. Health & Safety Code Ann. §382.0205, 382.05102. The TCEQ is statutorily authorized to "require a person whose activities cause emissions of air contaminants to submit information to enable the commission to develop an inventory of emissions of air contaminants in this state." Tex. Health & Safety Code Ann. §382.014. Likewise, the commission is empowered to "prescribe reasonable requirements for measuring and monitoring the emissions of air contaminants from a source or from an activity causing or resulting in the emission of air contaminants subject to the commission's jurisdiction." Tex. Health & Safety Code Ann. §382.016. As noted above, Texas has also adopted air quality programs in the past that could serve as useful models in designing a State Plan that complies with the CPP.

34. However, even if some additional legislative action is required to fully implement the CPP, it could be pursued while or after the State Plan is being developed/adopted if necessary or appropriate to expand and/or optimize opportunities to effectively implement the State Plan or to remove any barriers to its successful implementation and compliance. If any such legislative action is determined to be needed or desired, it can be pursued without delaying development

of a State Plan.[25] Texas can request the available two-year extension until September 2018 for final submission of the State Plan so that the 2017 Legislative Session will be available to address any such legislative actions.

Conclusion

35. In conclusion, it is my opinion that the CPP gives Texas significant flexibility to implement control measures and/or strategies necessary to reduce carbon dioxide emissions by 2030 to the goals specified. It gives the State and its electric generators broad discretion in how to achieve the emission goals by providing a framework that will enable adoption of a market-based approach to achieving reductions, allowing market economics to decide the best mix of generation resources to achieve the goal. Given its flexible, market-based approach, numerous electric generating companies in Texas indicate their respective abilities to comply with the CPP by the deadlines prescribed. The CPP gives Texas the option to participate in a multi-state plan instead of adopting its own State Plan, or Texas can choose to have a Federal Plan implemented to comply with the CPP if it is unable to timely submit a State Plan, or chooses not to do so. Texas likewise has the flexibility to request a two-year extension, thus giving the State until at least September 2018 to finalize and submit its State Plan or choose implementation of a Federal Plan.

[25] Declarants for Petitioner State of Texas suggest that CPP implementation in Texas is rendered more difficult because the Texas Legislature meets only once every two years. Declaration of Richard A. Hyde, P.E., C000073. While correctly pointing out that the Governor may call for special sessions, these declarants fail to mention that significant legislative work is done at the committee level between legislative sessions. The Texas legislative process does not grind to a halt between sessions.

36. Though declarants for Petitioner Texas suggest otherwise, the CPP's requirements are not any more complex or unprecedented than other federal regulations and standards Texas has faced in implementing many other national air quality standards and/or regulations. The actions, control measures and strategies needed to be adopted and/or implemented, along with the coordination required among all interested stakeholders, are no more complex and unprecedented than would be required for almost any other State Implementation Plan.

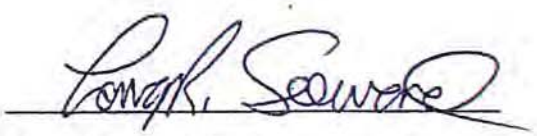
37. The TCEQ has existing programs in place, and adequate staff and budgetary resources allocated to it which, if reasonably and timely allocated, can perform the work required to develop a State Plan for the CPP within the timeframe available to the TCEQ. It is not uncommon for the TCEQ to allocate and/or re-allocate resources as necessary or appropriate to accomplish required work in the timeframes allowed. Likewise, the agency is routinely accustomed to working with timelines similar to those specified in the CPP and meeting such deadlines, especially as related to development and submission of State Implementation Plans.

38. Texas' energy mix is well on its way to achieving CPP's goals, leaving Texas well-positioned to meet its carbon dioxide targets. Natural gas and renewables are increasing as power sources in Texas and the use of coal is declining due to market drivers. ERCOT's own projections as to current and future electric generation fuel mixes, combined with current data showing energy efficiency gains already being realized by various Texas utilities, indicate that 88% of the CPP's 2030 compliance goal can already be achieved and full compliance with the 2022-2029 interim target.

Other projections indicate that the 12% compliance gap can reasonably be filled through energy efficiency measures already in place in the State along with efficiency levels projected to be achievable in the next 10 years.

39. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on December 7, 2015



Larry R. Soward

IN THE
UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF WEST VIRGINIA, STATE OF TEXAS, *et al.,* Petitioners, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.* Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF JOHN HALL, TEXAS DIRECTOR, CLEAN ENERGY PROGRAMS, ENVIRONMENTAL DEFENSE FUND

I, John Hall, declare as follows:

1. I am the Texas Director of Clean Energy Programs at Environmental Defense Fund ("EDF").

2. I served as Chairman of the predecessor agencies of the Texas Commission on Environmental Quality ("TCEQ") from 1991-1995, and as Executive Director of the Texas Environmental Research Consortium ("TERC") from 2001-2007. Additionally, since 1995 I have provided consulting assistance to Fortune 500 companies in Texas, advising them on how to comply with various environmental standards.

3. While at TERC from 2001-2007, I directed air quality research efforts for the Houston and Dallas-Ft. Worth metropolitan areas and also provided professional assistance to key stakeholders in both regions to develop effective approaches to comply with the one-hour ozone standard.

4. More recently, I helped direct an EDF study analyzing Texas's ability to comply with the U.S. Environmental Protection Agency's ("EPA") final rule titled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" dated August 3, 2015 (the "Rule," "Clean Power Plan" or "CPP").[1] The results of this study were published in October, 2015 in an EDF report titled "Well Within Reach: How Texas Can Comply with and Benefit from the Clean Power Plan."("EDF CPP Report").[2] I am a principal author of this report.

5. In preparing this report, EDF extensively studied data and trends concerning power generation in Texas and the Electric Reliability Council of Texas ("ERCOT") power region which covers approximately 90% of the state. These efforts included an extensive analysis of the types and quantities of power generating capacity on the ERCOT grid over the past two decades, analysis of current trends in

[1] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,661 (Oct. 23, 2015).

[2] Environmental Defense Fund, *Well Within Reach: How Texas Can Comply with and Benefit from the Clean Power Plan*, http://www.edf.org/sites/default/files/content/cpp-texas_report.pdf

new generation capacity, and analysis of energy efficiency ("EE") programs and initiatives at utilities in the ERCOT region.

6. In light of my background and particularly the studies and reports noted above, I have personal knowledge of the current state of power generation within Texas and the ERCOT region, including current trends and economic forces affecting the power generation mix within Texas and ERCOT.

7. The CPP is an EPA final rule implementing requirements under the federal Clean Air Act ("CAA"). TCEQ has been delegated responsibility for implementing and enforcing aspects of the CAA in Texas, subject to oversight by EPA. As a result of my experience noted above, I am generally familiar with the processes by which TCEQ implements its authority and responsibilities under the CAA.

8. I have reviewed the Declarations by Richard A. Hyde, P.E., Executive Director of the Texas Commission on Environmental Quality ("Hyde Declaration") and Brian H. Lloyd, Executive Director, Public Utility Commission of Texas ("Lloyd Declaration") submitted by Petitioners State of West Virginia, *et al.*

9. In their declarations, Mr. Hyde and Mr. Lloyd make the following allegations concerning the Rule:

(1) The Rule will have near-term impacts that will: "upend" Texas's competitive regulatory markets, causing "degraded reliability," and

"substantial impacts on the PUCT's [Public Utility Commission of Texas] activities related to transmission planning and reliability;"[3]

(2) "The Rule requires the [TCEQ, PUCT and other agencies] to make immediate and fundamental decisions about Texas's environmental and energy policy within a year;"[4] and

(3) "absent a stay, Texas will not have sufficient time to develop a State plan." [5]

10. Each of these allegations is unfounded, exaggerated, and/or inconsistent with the data Mr. Lloyd and Mr. Hyde cite. For the specific reasons discussed below, there is no indication that significant generating unit retirements will occur in the near-term as a result of the CPP. In fact, the Texas electricity market is currently undergoing a substantial expansion of generating capacity, led by strong growth in natural gas and renewables. In light of these changes, achieving compliance with the CPP will not be difficult for Texas, and Texas has ample time to comply.

The CPP Will Not Cause Dramatic Changes In the Texas Electricity Market or Render the Grid Unreliable.

11. Mr. Lloyd makes a series of related claims that the CPP "seeks to mandate severe reductions in the output of EGUs fueled by coal and natural gas,"

[3] Lloyd Declaration at ¶¶31-36, 63-77.

[4] Hyde Declaration at ¶11.

[5] Lloyd Declaration at ¶¶ 88-93.

that these reductions "will cause EGUs to completely shut down not because of market forces, but because of regulatory fiat," and "will force EGUs to make irreversible decisions in the next one to three years."[6] Mr. Lloyd argues that the Rule "represents a severe intrusion into" Texas electricity markets, and further suggests that these changes will compromise the reliability of Texas's power grids.[7] Similarly, Mr. Hyde claims that "in order to achieve the final emission performance goals, Texas will be required to make fundamental changes in its energy policy to force shifts in the generation of electricity from coal-fired EGUs to NGCC and carbon-neutral generation resources."[8] Each of these claims is contradicted by ERCOT and other data regarding the current state of Texas electricity market and current generation trends.

(i) Texas's Electricity Market Has Already Been Transformed by Robust Growth of Natural Gas and Renewable Energy Generation

12. ERCOT and other data fails to support the position that the CPP will disrupt Texas's electricity market by driving out coal and natural gas-fired generation. Texas is *already* transitioning to a clean energy economy, with: (1) substantial recent additions of wind, natural gas, and solar generating capacity; and (2) decreased reliance on CO_2-intensive coal generation. The combined share of coal and natural gas in the

[6] Lloyd Declaration at ¶31.

[7] *Id.*

[8] Hyde Declaration at ¶26.

Texas generation "mix" declined from 88% in 2002 to 82% in 2013, while wind power rose from 1% to 8% during the same period.[9]

13. Moreover, since 2013, ERCOT has seen a substantial increase in new natural gas generation capacity, in addition to continued growth in wind and solar generation capacity. This is demonstrated by ERCOT's recent "Capacity, Demand and Reserve" reports ("Reserve Reports") which track generation capacity in the ERCOT region. For example, ERCOT's December, 2014 Reserve Report shows that, as of that reporting period, 1,908 MW of gas-fired generation projects and 2,606 MW of combined wind and solar generation capacity finalized the necessary agreements and permits to be added to the Reserve Report (*i.e.,* have passed critical development milestones such that ERCOT deems it proper to add to the reports).[10] In this same report, 2,109 MW of gas-fired generation capacity and 748 MW of wind and solar capacity was moved to "Operational Status" by ERCOT. To put this generation capacity in perspective, 1 MW can power approximately 1,000 homes, and therefore 1,000 MW can power approximately 1,000,000 homes.[11]

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[9] EDF CPP Report, *supra* n. 2 at 8-9.

[10] ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region* (Dec. 1, 2014) at 6-7, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-Dec2014.pdf

[11] Brown, Rich (Ernest Orlando Lawrence Berkley National Laboratory), "Electricity Use in California, Past Trends and Present Usage Patterns" (Powerpoint presentation) at slide 11, http://enduse.lbl.gov/Info/CA_Presentation/sld011.htm

14. This trend accelerates in ERCOT's May 2015 Reserve Report. In this report, 2,591.7 MW of new gas generation capacity, 460 MW of solar capacity and 1,491 MW of wind capacity finalized the necessary agreements and permits to be added to the Reserve Report.[12] In this same report, 1,418.6 MW of new wind and solar generation capacity was moved to Operational Status.

15. Likewise, in ERCOT's December 2015 Reserve Report, 1,596 MW of gas generation capacity, 1,149.7 MW of solar capacity and 3,179.3 MW of wind capacity were added to the Reserve Report. In the same report, 1,011.1 MW of gas generation capacity and 1975.8 MW of wind capacity was moved to operational status.[13]

16. Thus, during the last two years, ERCOT's Reserve Reports reflect an addition of over 6,095 MW of gas fired generation and 8,886 MW of renewable energy. In the same time period, over 3,120 MW of new gas generation and over 4,142 MW of new renewable generation has moved to Operational Status. During the same period, no new coal-fired generation was added.

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[12] ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,* (May 4, 2015) at 5, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-May2015.pdf

[13] ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,* (Dec. 1, 2015) at 5-6, http://www.ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-December2015.pdf

17. Above and beyond the new capacity reflected in the Reserve Reports, TCEQ records reflect that applications for some or all of the necessary air quality permits are currently pending for an *additional* sixteen proposed gas-fired EGUs, with a collective incremental generation capacity of approximately 10,000 MW.[14] To put this number in perspective, the potential 10,000 MW capacity reflected in these pending permits is *almost 13%* of the current total operational summer generation capacity within the ERCOT region.[15] Thus, Texas is currently experiencing a substantial influx of new natural gas generation capacity, and is already poised to experience even more substantial growth in gas-fired generation capacity.

18. These trends reflect the fact that Texas is blessed with: (1) a fast-growing renewable energy sector and the capacity to add much more renewable generation; and (2) abundant, low-cost, local supplies of natural gas. In fact, Texas produces more natural gas by far than any other state.[16]

19. ERCOT's own reports reflect that these factors, and not environmental regulation, have made it difficult for coal-fired generation to compete. Specifically, in its own analysis of the CPP, ERCOT noted that since 2011, it has observed "the

[14] TCEQ computer printout, "Gas Turbines Rated 20 MW and Greater Electric Output, Pending Air NSR Permits for Criteria Pollutants or for GHG Pollutants," (Nov. 9, 2015) (copy in Declarant's possession).

[15] ERCOT December 2015 Reserve Report at 8 (showing total 2016 operational generation capacity in ERCOT to be 77,125 MW).

[16] U.S. Energy Information Administration, "Natural Gas Withdrawals and Production (Gross Withdrawals-Texas)" http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm

seasonal mothballing of almost 2,000 MW of coal capacity . . . due primarily to lower wholesale power prices, and not environmental regulations."[17]

20. Texas is also poised to add significant solar generation capacity in coming years. Under ERCOT's competitive market structure, lowest priced generation resources get placed on the grid first. Currently, those are Texas' clean energy resources, including energy efficiency, demand response, wind, natural gas, and increasingly solar. Price declines for solar have been impressive in recent years: in Texas, Austin Energy recently finalized a Purchase Power Agreement (PPA) for solar at under 5 cents per KWh.[18] Elsewhere, Nevada Power recently finalized a similar PPA for solar at a reported 3.87 cents per KWh.[19] These costs are substantially below the average rate for power from baseload coal units, which have an average levelized cost of energy in the United States of 6.5-15 cents per KWh.[20]

21. In fact, Texas' increased reliance on natural gas and renewables for power generation has been accompanied by a dramatic decrease in average electricity

[17] ERCOT, *Impacts of Environmental Regulations in the ERCOT Region* (Dec. 6, 2014) at 3; http://www.ercot.com/content/news/presentations/2014/Impacts%20of%20Environmental%20Regulations%20in%20the%20ERCOT%20Region.pdf

[18] Cheapest Solar Ever: Austin Energy Gets 1.2 Gigawatts of Solar Bids for Less Than 4 Cents, Greentech Media.com (Jun. 30, 2015) http://www.greentechmedia.com/articles/read/cheapest-solar-ever-austin-energy-gets-1.2-gigawatts-of-solar-bids-for-less

[19] NV Energy Buys Utility-Scale Solar at Record Low Price Under 4 cents/kWh, Utility Dive (Jul. 9, 2015), http://www.utilitydive.com/news/nv-energy-buys-utility-scale-solar-at-record-low-price-under-4-centskwh/401989/

[20] Lazard. "Lazard's Levelized Cost of Energy Analysis – Version 9.0." (Nov. 2015). *See* https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf

prices, with average annual real-time market prices within ERCOT declining from approximately $70 per MWh in 2005 to approximately $40 per MWh in 2014.[21]

22. Thus, the data shows that Texas will not be required to "make fundamental changes in its energy policy to force shifts in the generation of electricity from coal-fired EGUs to [natural gas combined cycle] and carbon-neutral generation" as Mr. Hyde alleges.[22] These shifts are already occurring – and in fact are accelerating – within Texas's existing free market structure, without negatively impacting rates (or reliability, as discussed further below). The CPP is consistent with these current trends in the Texas power sector.

(ii.) Contrary to Declarants' Assertions, ERCOT Reports Show that a Significant Loss of Generating Capacity Is Unlikely to Occur in the Next Five Years.

23. Mr. Lloyd contends ERCOT has concluded that, as a result of the Rule and the timing of other environmental regulations, "many" coal-fired EGUs "would be retired before 2022" and "[i]n some cases, these retirements will occur as early as 2016," threatening system reliability.[23] In support of this claim, Mr. Lloyd cites an

[21] EDF CPP Report at 9-10.

[22] Hyde Declaration at ¶26.

[23] Lloyd Declaration at ¶¶ 42-43.

October, 2015 ERCOT report titled "ERCOT Analysis of the Impacts of the Clean Power Plan." ("ERCOT CPP Report").[24]

24. As Mr. Lloyd concedes, the compliance period under the CPP does not begin until 2022 – seven years in the future. Nevertheless, Mr. Lloyd alleges that two other EPA rules – the Mercury and Air Toxics Rule ("MATS") and proposed Regional Haze Rule – "are a significant driver of . . . capital expenditure needs [and] absent a stay of the Rule, owners of these power plants will be more likely to decide to retire power plants rather than make additional capital expenditures that they would not be able to recoup . . . [t]hese decisions are likely to occur far in advance of 2022 [and] in some cases may occur imminently." [25]

25. Mr. Lloyd's claims exaggerate the imminency of impacts under these other EPA rules, and are inconsistent with ERCOT's conclusions in the ERCOT CPP Report and other ERCOT reports. The first of these two additional rules – the Regional Haze federal implementation plan for Texas – has *not even been adopted yet by EPA*. As proposed, the Regional Haze rule would not require compliance until at least three years with regard to some specified sources, and with regard to many other

[24] ERCOT, *ERCOT Analysis of the Impacts of the Clean Power Plan* (October 16, 2015), http://www.ercot.com/content/news/presentations/2015/ERCOT_Analysis_of_the_Impacts_of_the_Clean_Power_Plan-Final_.pdf

[25] Lloyd Declaration at ¶42.

sources compliance would not be required until five years after adoption.[26] Thus, even if it were adopted today, the proposed Regional Haze rule would not mandate *any* emissions reductions until the very end of 2018, and in many cases emissions reductions would not be required until the end of 2020 or later. With these extended compliance timeframes, there is no immediate need for Texas EGUs to make irreversible decisions on capital investments. It is also unreasonable to expect that any facility would choose to take immediate action to comply with Regional Haze requirements because the rule has not even been finalized yet and it is not possible to know with certainty what its final requirements will be.

26. Additionally, Mr. Lloyd's claim that "retirements will occur as early as 2016" contradicts ERCOT's reports concerning the MATS rule. Power plants were generally required to come into compliance with MATS by April 2015, although many power plants have requested one-year extensions of the compliance deadline under section 112 of the CAA. Given that even this extended compliance deadline is less than five months away, ERCOT has acknowledged that most coal-fired EGUs that are subject to MATS already "have identified compliance strategies for MATS."[27] In fact, ERCOT concluded in a December 2014 report that impacts from MATS "are unlikely to impact overall trends on the ERCOT system as they are not expected to

[26] Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans, 79 Fed. Reg. 74,818, 74,888-89 (Dec. 16, 2014).

[27] ERCOT, *Impacts of Environmental Regulations in the ERCOT Region*, *supra* n. 17 at 3.

affect the economics of a significant number of units."[28] In accordance with this finding, ERCOT did not even consider MATS in its CPP Report, stating "implications of potential MATS-related retirements in 2016 are not considered in this analysis."[29] ERCOT then cited its prior December 2014 report, which again concluded MATS would not have a significant impact.[30]

27. ERCOT's reports therefore do not support Mr. Lloyd's claims that unit retirements "will occur" as early as 2016. To the exact contrary, ERCOT has found only that there are "potential" MATS retirements, and that in any case such retirements "will not affect a significant number of units."

28. Accordingly, the only two regulations that ERCOT concluded *could* ultimately have a significant impact on generating capacity (i.e., the CPP and the Regional Haze rule) do not require any emissions reductions until at least three years in the future, and in most cases emissions reductions will not be required for five years or more. Moreover, the Regional Haze rule and its specific compliance requirements are not yet final, nor are state plans under the CPP.

29. Furthermore, as noted above, some power generators already are seasonally mothballing coal plants in Texas due to the lessened ability of coal-fired power to compete economically with cheaper power sources. In these instances,

[28] *Id.* at 12.

[29] ERCOT CPP Report, *supra* n. 24, at 3.

[30] *Id.*

power generators have chosen to mothball – but not permanently retire - EGUs so that they remain available for use during periods of peak power demand. Thus, "retirement" of coal plants is not in each case necessarily permanent or irreversible.

30. Accordingly, in my opinion, Mr. Lloyd's insinuation that ERCOT data shows that a significant number of unit retirements will occur in the near term as a result of the CPP is misleading and unfounded. ERCOT's reports refute Mr. Lloyd's contention that the CPP creates an imminent threat of significant loss of generating capacity.

(ii) Even if Unit Retirements Were to Occur, ERCOT Has Large Reserve Margins Due to a Surge in Gas and Wind Generation.

31. Moreover, in the unlikely event that significant retirements of coal-fired generating capacity were to occur in the near term, ERCOT's data indicates that such retirements are unlikely to pose a threat to system reliability.

32. ERCOT's reports show that, as a result of the recent surge in new natural gas and wind generation capacity, ERCOT's "reserve margins"[31] have grown substantially since 2012. ERCOT's May 2012 Reserve Report[32] predicted a reserve

[31] ERCOT's "reserve margins" reflect the percentage by which the total generating resources exceed projected ERCOT's firm load forecast in coming years – in essence, the percentage by which the estimated power generation supply exceeds the estimated peak power demand.

[32] ERCOT, *Report on the Capacity, Demand and Reserves in the ERCOT Region,* May, 2012, at 5, http://www.ercot.com/content/news/presentations/2012/CapacityDemandandReserveReport-2012.pdf

margin of less than 10% for the year 2014, with future reserves declining quickly and going negative in 2022.

33. ERCOT's December 2015 Reserve Report shows a dramatic expansion of the reserve margin in the intervening three years. With the substantial additional capacity added since 2012, largely consisting of the gas and wind generation capacity described above, future "Summer Summary" reserve margins now are robust: 16.5% in 2016, 20.7% in 2017, 25.7% in 2018, 22.9% in 2019, and 21.8% in 2020.[33] The reserve margins are still over 16% in 2025, the final year of the report. These reserve margins significantly exceed ERCOT's minimum target reserve margin of 13.75%.[34]

34. These reports show that Texas has an ample "reserve margin" to ensure sufficient power resources in the event of any loss of current generating capacity in coming years. Consistent with this, ERCOT's own modeling results indicate that, to the extent there are future retirements of coal capacity due to environmental regulations, "generation from retiring coal capacity will in large part be replaced by increased production from existing natural gas capacity."[35]

35. Finally, Mr. Lloyd contends that ERCOT had less than 5,000 MW of excess capacity available on specific days in the summer of 2015. Lloyd Declaration at ¶44. These claims, which are not supported by citation to any documents, are

[33] ERCOT December 2015 Reserve Report, *supra* n. 13 at 7.

[34] ERCOT, "Resource Adequacy" website page, http://www.ercot.com/gridinfo/resource

[35] ERCOT, *Impacts of Environmental Regulations in the ERCOT Region, supra* n. 17 at 24.

contradicted by ERCOT's Reserve Reports. These Reserve Reports show that, from 2015 to 2018, Total Capacity on the ERCOT system will grow from 77,166 MW[36] to 87,251 MW,[37] and Total Capacity will exceed projected Firm Peak Load by over 10,000 MW in every year through 2025. ERCOT's own Reserve Reports establish that ERCOT has ample reserve capacity in the near term.

The Rule Does Not Require Immediate and Fundamental Changes to Texas's Energy and Environmental Policies.

36. Both Mr. Hyde and Mr. Lloyd contend that the CPP requires Texas to take immediate and substantial steps to achieve the 2022 and 2030 benchmarks required by the CPP. For example, Mr. Hyde claims that "implementation of the Rule will likely require fundamental statutory and regulatory changes that will require the immediate, substantial expenditure of unrecoverable Texas resources."[38] Likewise, Mr. Lloyd claims that "the Texas Legislature, the PUCT, and ERCOT . . . will be required to consider, design and implement extensive modifications to the existing market design for the ERCOT power region and engage in other activities to ensure that reliability within ERCOT is maintained."[39]

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[36] ERCOT, December 2014 Reserve Report, *supra* n. 10 at 9.

[37] ERCOT December 2015 Reserve Report, *supra* n. 13 at 8.

[38] Hyde Declaration at ¶32.

[39] Lloyd Declaration at ¶47.

37. In my professional opinion, these allegations are unfounded. Given the CPP's flexible approach, Texas retains substantial discretion in achieving compliance with the CPP. My research shows that such compliance can be achieved with extremely modest measures that do not require any substantial re-ordering of Texas's electric utility system and that reflect on-going trends in Texas' electricity markets.

38. As noted above, I participated in EDF's study concerning Texas's ability to comply with the requirements of the CPP, which found that: (1) Texas has abundant clean energy assets (including natural gas, wind, and solar) that surpass every other state by a very wide margin; (2) under ERCOT's competitive market structure, the lowest priced generation resources get placed on the grid first, which currently are Texas' clean energy resources, including energy efficiency, wind, natural gas, and increasingly solar; and consequently (3) Texas is already transitioning to a clean energy economy.

39. Given these facts, it is clear that market trends are already driving Texas toward a much lower average intensity of CO_2 emissions per unit of power generated, one path to compliance with the Rule. In light of these trends, in the EDF Report we modeled various future scenarios to determine to what extent Texas can achieve 2022 and 2030 emissions targets under the CPP through "business as usual" or modest incremental action.

40. In connection with the EDF Report, we modeled four (4) distinct scenarios. In doing so, we relied on ERCOT's projections to the greatest extent

possible, and we used the MJ Bradley & Associates Analytical Tool to model the four scenarios we evaluated. This analytical tool is a transparent, user-friendly, publicly available platform that is designed to estimate the impacts of state policy choices and resource changes on a state's compliance status under the Clean Power Plan.[40]

41. The first scenario we modeled was an ERCOT "business as usual" scenario, which did not include any regulatory impacts from the Clean Power Plan, the EPA's Cross State Air Pollution Rule, or the Regional Haze Rule. This same scenario was included in the December 16, 2014 ERCOT report described above which assessed the impacts of various EPA regulations on the power sector.

42. Under this very conservative "business as usual" scenario, which assumes no additional emissions reductions resulting from other EPA regulations, ERCOT is already on track to achieve 47% compliance with the 2030 goals of the CPP, and 51% compliance toward the 2022-2029 interim target.[41]

43. As we continued our research, we recognized this scenario did not reflect more recent baseline projections ERCOT has made regarding wind power and the decline of electricity derived from coal. For example, ERCOT released a report in June 2015 reporting that wind production levels in its region would reach 16 GW by

[40] This tool and its methodology are described in detail in the accompanying Declaration of Diane Munns. *See* http://www.mjbradley.com/about-us/case-studies/clean-power-plan-evaluation-tools.

[41] EDF CPP Report, *supra* n. 2 at 18-20.

the end of 2015, and would further grow to 23.4 GW by the end of 2017.[42] Additionally, the "LTSA Scenarios Results" that ERCOT released in October 2014 included a current trends scenario, which placed natural gas generation for 2029 at 51% of total generation and solar at 6% of total generation. This ERCOT report projected continued reductions in the use of coal.[43]

44. We used these ERCOT numbers to create a second scenario, which we titled "EDF's Business As Usual Comprehensive Current Trends Scenario" ("Comprehensive BAU Scenario"). It included ERCOT projections, except for one variable. In its December 2014 report, ERCOT projected cumulative energy efficiency outcomes through 2029 of 1.0% of demand. We recognized this projection did not include the energy efficiency gains *already* being achieved by Austin Energy and CPS Energy (San Antonio's municipally-owned utility, which is the largest such utility in the nation), both of which are located in the ERCOT region. We added the energy efficiency outcomes of these municipally owned utilities along with those already being achieved by Pedernales Electric Cooperative and the private utilities in ERCOT.

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[42] ERCOT, "Generator Interconnection Status Report—June 2015." http://www.ercot.com/content/ gridinfo/resource/2015/generation/GIS_REPORT__ June_2015_REVISED.xls

[43] ERCOT, LTSA Scenarios Report, October 2014, at slide 11, https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKEwiym8KZ5cLJAhVLOz4KHQtGCIkQFggzMAI&url=http%3A%2F%2Fwww.ercot.com%2Fcontent%2Fmeetings%2Frpg%2Fkeydocs%2F2014%2F1021%2FLTSA%252010-21-2014%2520Scenario%2520Results.ppt&usg=AFQjCNGrV2zugcW7uUytNrqEbXb-Qx42QA&sig2=dv0zhB8QSH0snaIGjjhxIg&bvm=bv.108538919,d.cWw

We assumed these entities' current collective modest energy efficiency levels would be continued annually from 2020-2030. When this assumption is made, system-wide energy efficiency is 1.4%.

45. Under this scenario, ERCOT is on track to achieve 88% of the CPP's 2030 compliance goal, and full compliance with the 2022-2029 interim target.[44]

46. These encouraging results prompted us to use the MJ Bradley Analytical Tool to perform another scenario to determine the most cost-effective path Texas and generators may take to achieve full CPP compliance in 2030. While the CPP provides the State of Texas and generators the flexibility to select any mix of options they choose to comply, we concluded energy efficiency was the most cost effective option to fill the remaining 12% 2030 compliance gap for three reasons: (1) it is Texas's cheapest energy resource; (2) it reduces customers' utility bills; and (3) Austin Energy and CPS Energy already have demonstrated that power providers can achieve substantial energy efficiency gains. Austin Energy is already on track to achieve its goal of saving 800 MW of peak demand savings through energy efficiency by 2020, which is equivalent to reducing its peak demand *by almost 17 percent* of what forecasted 2020 peak demand would be without energy efficiency (4,800 MW), while CPS Energy is on track to achieve a similar goal.[45]

[44] EDF CPP Report, *supra* n. 2 at 18-20.

[45] *Id.* at 20.

47. The results of this scenario show that increasing energy efficiency to modest 7.0 percent of forecasted BAU demand by 2030 – far below the goals already shown to be achievable by Austin Energy and CPS Energy – would enable Texas to fully comply with the CPP. [46] The analyses we performed verify that Texas is already on track *under current policies and market conditions* to achieve near-compliance with the Clean Power Plan.

48. As such, Mr. Lloyd's and Mr. Hyde's contentions that compliance with the CPP requires immediate or fundamental decisions regarding Texas's electric markets, or substantial changes from "business as usual," are simply not supported by the data. As shown in EDF's modeling scenarios, the CPP compliance benchmarks – which in any event do not take effect until many years in the future – can easily be achieved with modest, and already proven, steps and strategies.

49. Therefore, in my opinion, the Declarants' claims that complying with the Rule will require radical short-term action on the part of the State of Texas are unfounded.

[46] *Id.* at 21-22.

Texas Has Ample Time to Develop a State Plan

50. Finally, Mr. Lloyd alleges that Texas lacks sufficient time to develop the necessary State Plan under the CPP.[47] Again, this claim cannot be squared with the facts.

51. First, it is important to note that the CPP does not require states to submit plans. Following a long-standing aspect of the CAA's operation, states have the option of choosing not to act and having a federal plan applied to their state. Under this approach, a state does not need to undertake any planning or implementation.

52. For states that choose to develop and submit a State Plan, the CPP contains ample flexibility. Although State Plans are due in September 2016, the EPA has provided for a process whereby states may obtain extensions until September 2018 by filing an extension request. The requirements for such an extension request are minimal, consisting merely of:

- Identification of the final plan approach or approaches being considered by the state and description of progress made to date on the final plan components;
- An explanation of why the state requires additional time to submit a final plan; and

[47] Lloyd Declaration at ¶¶ 88-93.

- A demonstration or description of the opportunities for public comment and meaningful stakeholder engagement provided during the initial submittal and plans for public engagement during development of the final plan.[48]

53. For all of the reasons discussed above, Texas need not immediately enact any far-reaching or substantial changes in order to meet CPP requirements, as: (1) the first CPP benchmarks will not become effective until 2022, and are less stringent (and easier to attain) than the ultimate 2030 standards; and (2) Texas is already well-situated to meet those goals with minimal effort and disruption to "business as usual" and its current electricity market structure.

54. However, even if Texas were to conclude that, for example, compliance with the Rule required: (i) the creation of new interagency agreements, or (ii) the establishment of a carbon dioxide emissions trading regime,[49] Texas has almost three (3) years (until September 2018) to decide on such a final plan, and several additional years thereafter to implement such plans.

55. In fact, as shown above in EDF Report Comprehensive BAU Trends scenario, if one projects current ERCOT market trends and accounts for actual energy efficiency gains already being realized by Texas electric utilities, Texas will meet

[48] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, 80 Fed. Reg. 64,661, 64,856 (Oct. 23, 2015).

[49] See Lloyd Declaration at ¶82.

the CPP's 2022-2029 interim standard with no additional actions being required. Thus, proactive CPP compliance strategies are unlikely to be required until well over a decade in the future.

56. To the extent that Mr. Hyde and Mr. Lloyd indicate that Texas will be harmed because the TCEQ, PUCT and other agencies are required to spend time and resources in assessing the Rule and possible means of compliance, this claim is misplaced and fails to appreciate the role of regulatory agencies. It is the job of TCEQ to perform such actions as necessary to administer the CAA; this is and has been a routine function of the TCEQ and its predecessor agencies since they were delegated authority to administer the CAA. In my opinion, developing a plan for compliance with the Rule requires only modest efforts – extremely modest in the coming year – and is consistent with the usual types of actions that the TCEQ already performs in complying with new federal rules under the CAA.

57. In sum, Texas' CPP compliance plan can be developed within the context of ERCOT's competitive market, taking advantage of market trends towards the increased utilization of wind and solar generation, as well as maximizing the use of energy efficiency. As demonstrated, only modest efforts are required.

Conclusion

58. For all the reasons set forth above, it is my opinion that Mr. Hyde's and Mr. Lloyd's declarations are inconsistent with Texas' current context, including current data and ERCOT's reports. The risks and harms to Texas and its electricity

markets alleged in Mr. Hyde's and Mr. Lloyd's declarations are in each case either overstated or unfounded. The legal requirements under the CPP do not create any significant risk of harm to Texas's interests or electrical markets in Texas, much less any imminent risk that would be addressed by a stay.

59. I declare under penalty of perjury under the law of the United States of America that the foregoing is true and correct.

60. Executed on December 7, 2015.

John Hall

IN THE
UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF WEST VIRGINIA, STATE OF TEXAS, *et al.*, Petitioners, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Respondents.	Case No. 15-1363 and consolidated cases

DECLARATION OF KARL R. RÁBAGO,
EXECUTIVE DIRECTOR, PACE ENERGY AND CLIMATE CENTER,
PACE UNIVERSITY SCHOOL OF LAW

I, Karl R. Rábago, declare as follows:

Background

1. I am currently the Executive Director of the Pace Energy and Climate Center ("Pace") project of Pace University, at the Pace Law School, in White Plains, New York.

2. I am an attorney licensed to practice law in Texas. I earned my bachelor's degree in management from Texas A&M University, my juris doctorate from the University of Texas School of Law, and post-doctorate master of laws

degrees from the United States Army Judge Advocate General's School (military law) and Pace Law School (environmental law).

3. I served as a Commissioner of the Public Utility Commission of Texas from 1992-1994. During that time, I worked to establish Texas' first commercial-scale wind farm, and I was appointed by Governor Ann Richards to co-chair and organize the Texas Sustainable Energy Development Council. I also served as Vice-Chair of the National Association of Regulatory Utility Commissioners (NARUC) Committee on Energy Conservation.

4. I also served as Deputy Assistant Secretary for Utility Technologies in the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy from 1995-1996. My additional relevant experience includes service as vice president for Distributed Energy Services for Austin Energy, the municipal electric utility for Austin, Texas, from 2009-2012; director of Government and Regulatory Affairs for the AES Corporation, from 2006-2008; and group director for Energy and Building Solutions with the Houston Advanced Research Center, from 2003-2006. From 1996 to 1998, I served as Energy Program Manager at the Environmental Defense Fund.

5. In all, I have nearly 20 years of experience working in Texas and on Texas energy and environmental issues in various capacities. In these capacities, I have had the opportunity to work extensively on electric utility regulatory, legislative, and

policy issues; renewable energy development issues, voluntary markets for renewable energy; and other aspects of energy markets and regulation.

6. In preparing this Declaration, I have reviewed numerous documents, reports and on-line databases, including but not limited to: (a) the U.S. Environmental Protection Agency's ("EPA") final rule titled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" dated August 3, 2015 (the "Clean Power Plan" or "CPP");[1] (b) numerous reports prepared by ERCOT including "ERCOT Analysis of the Impacts of the Clean Power Plan" ("ERCOT CPP Report");[2] (c) the Motion to Stay filed by Petitioners State of West Virginia, *et al.* ("Petitioners"); and (d) the respective Declarations of Richard A. Hyde, P.E., Executive Director of the Texas Commission on Environmental Quality ("Hyde Declaration") and Brian H. Lloyd, Executive Director, Public Utility Commission of Texas ("Lloyd Declaration") attached to Petitioners' motion.

7. In light of my experience and the materials that I have reviewed, I have personal knowledge of the state of power generation within Texas and within the

[1] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64662 (October 23, 2015).
[2] ERCOT, *ERCOT Analysis of the Impacts of the Clean Power Plan* (October 16, 2015), http://www.ercot.com/content/news/presentations/2015/ERCOT_Analysis_of_the_Impacts_of_the_Clean_Power_Plan-Final_.pdf
[2] ERCOT, *ERCOT Analysis of the Impacts of the Clean Power Plan* (October 16, 2015), http://www.ercot.com/content/news/presentations/2015/ERCOT_Analysis_of_the_Impacts_of_the_Clean_Power_Plan-Final_.pdf

ERCOT region, including past and current trends and economic forces affecting the power generation mix within Texas and ERCOT.

8. The Rule described above is an EPA final rule implementing requirements under the federal Clean Air Act. The Texas Commission on Environmental Quality ("TCEQ") has been delegated responsibility for implementing and enforcing many Clean Air Act requirements in Texas, subject to oversight by EPA. The Public Utility Commission of Texas ("PUCT") is the Texas state agency with principal regulatory authority over electric service markets in Texas. As a result of my experience noted above, including my experience as a Commissioner for the PUCT, I am generally familiar with the processes by which the PUCT and the TCEQ, and other state agencies implement federal legal and regulatory obligations, such as those under the Clean Air Act.

9. In their declarations, Mr. Lloyd and Mr. Hyde seek to support the Petitioners' efforts to stay the operation of the Rule and to excuse the State of Texas from undertaking any efforts to prepare for and develop plans under the Rule. In particular, Mr. Lloyd and Mr. Hyde allege that the Rule will cause fundamental changes to the energy mix deployed in Texas, and will require unprecedented coordination between the state legislature and the relevant state agencies.[3] In fact, the exact opposite is true. Fundamental shifts in the Texas energy market began well

[3] Lloyd Declaration at ¶¶31-36, 88-93; Hyde Declaration at ¶11.

before adoption of the Clean Power Plan thanks to an abundance of low-price natural gas and a rapidly expanding market for wind power. Rather than undermine state policy, the Clean Power Plan is consistent with and supports existing Texas policies promoting renewable energy and energy efficiency.

The Texas Electric Generation Market is No Stranger to Change

10. In their declarations, Mr. Lloyd and Mr. Hyde assert that the Rule will require a fundamental and disruptive transformation of the electric generation fleet in Texas. This assertion is flawed in two key respects. First, the Texas electricity generation market is already undergoing significant change due to the operation of market forces unrelated to the CPP. That change has been toward greater investment in efficient, highly-affordable natural gas-fired combined-cycle generation and renewable energy. For example, recent ERCOT Capacity, Demand, and Reserve Reports reflect an addition of over 6,095 MW of gas fired generation and 8,886 MW of renewable energy since mid-2014.[4] In the same time period, over 3,120 MW of new gas generation and over 4,142 MW of new renewable generation has moved to

[4] ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region* (Dec. 1, 2014) at 6-7, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-Dec2014.pdf;

ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,(*May 4, 2015) at 5, http://ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-May2015.pdf;

ERCOT, *Report on Capacity, Demand and Reserves in the ERCOT Region,*(Dec. 1, 2015) at 5-6, http://www.ercot.com/content/gridinfo/resource/2015/adequacy/cdr/CapacityDemandandReserveReport-December2015.pdf.

"Operational Status."[5] During the same period, no new coal-fired generation was added. Thus, the Clean Power Plan is consistent with ongoing trends in the Texas electricity generation market.

11. Second, the Texas electricity generation market has undergone significant changes several times in the past several decades.[6] Substantial amounts of natural gas generation were added in the 1960s and 1970s. Although little coal generation was added between 1950 and 1975, a large amount of coal generation was added between 1975 and 1985. Two large nuclear power plants were brought on line between 1988 and 1993. And since 1999, when Texas passed electricity restructuring legislation that created a more market-based generation sector, the state has seen large additions of both natural gas and wind generation.

12. The historical evidence shows that Texas has often made significant shifts in the new generation capacity additions it has successfully integrated into the grid. Moreover, it has done so without compromising affordability or reliability. The following table demonstrates the changing nature of additions to the Texas electricity grid, and particularly the shift towards natural gas and wind beginning in 2000.[7] Texas' experience managing significant changes in its power sector, coupled with ongoing

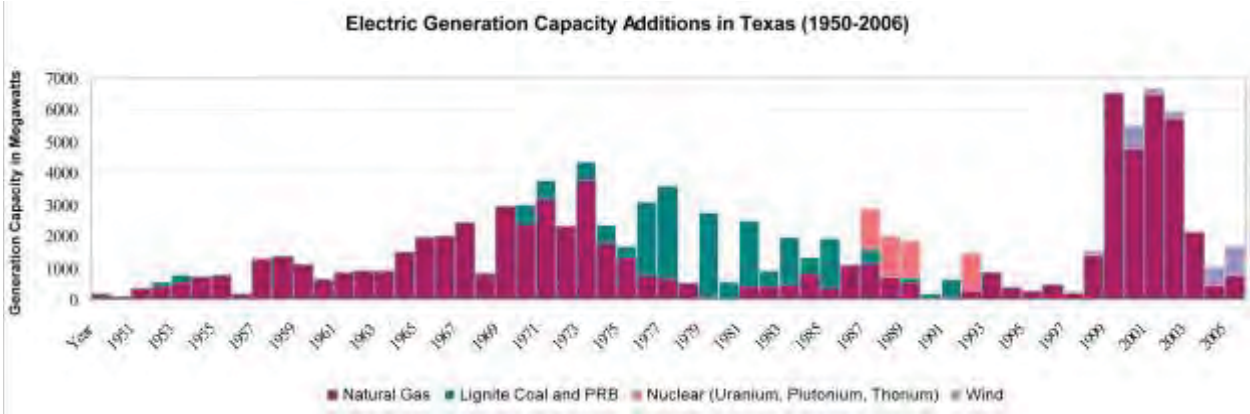
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[5] *Id.*

[6] Report of the Texas House of Representatives Committee on Electric Generation Capacity and Environmental Effects, Select - 80th R.S. (2007) at 19-21, http://www.lrl.state.tx.us/scanned/interim/80/EL26e.pdf

[7] *Id.* at 20.

trends towards a cleaner generating portfolio, position the state well for the Clean Power Plan.



Texas Agencies and Power Companies Have Already Successfully Implemented Renewable and Energy Efficiency Policies

13. Texas has decades of experience implementing clean energy policies that are consistent with achieving compliance with the Clean Power Plan. As far back as 1993, Texas Governor Ann Richards signed Executive Order AWR 93-6, establishing the Texas Sustainable Energy Development Council ("SEDC").[8] I served as co-chair of the SEDC, whose mission was to "develop a strategic plan to ensure the optimum utilization of Texas' renewable and efficiency resource base."[9] The Resource Assessment Report issued by the SEDC stated that "[p]erhaps the most compelling

[8] Gov. Ann Richards, Executive Order AWR 93-6, Establishing the Texas Sustainable Energy Development Council (Mar. 14, 1993), http://www.lrl.state.tx.us/scanned/govdocs/Ann%20W%20Richards/1993/AWR93-6.pdf

[9] *Id.* at 1.

reason to reexamine current methods of producing energy is the increasing level of atmospheric carbon dioxide."[10]

14. As a sitting Public Utility Commissioner, I launched a project in 1993 in which investor-owned, municipal, and cooperative electric utilities were asked to report on actions and plans relating to the issue of climate change. This initiative reviewed the efforts by utilities in-state to explore and implement renewable energy, energy efficiency, and other options for reducing exposure and addressing the risks of climate change.

15. In 1999, the 76th Texas Legislature passed Senate Bill 7, which not only created a more competitive market structure for the Texas electricity industry within ERCOT, but also included a renewable energy goal of 2,000 MW (also known as the Renewable Portfolio Standard or "RPS").[11] The bill also directed PUCT and ERCOT to establish a trading system for renewable energy credits that has proven highly effective.[12] The RPS mandatory goal was subsequently raised to 5,000 MW by 2015 by the Legislature, which also added a non-binding target of 10,000 MW of renewable energy capacity by the year 2025. As of the end of 2014, ERCOT reported over

[10] Texas Sustainable Energy Development Council, *Texas Renewable Energy Resource Assessment – Survey, Overview and Recommendations* (July 1995) at 20, http://www.seco.cpa.state.tx.us/re/docs/re_study1995.pdf.

[11] Texas Legislature, S.B.7, 76th Leg. (1999), http://www.capitol.state.tx.us/tlodocs/76R/billtext/html/SB00007F.htm

[12] *Id.*; *see also* Tex. Utils. Code § 39.904(b).

16,000 MW of installed renewable energy capacity in Texas—well in excess of the 2025 RPS target set by the Texas Legislature.[13]

16. In addressing the impact of the Clean Power Plan on Texas' renewable energy policy, Mr. Lloyd makes two errors of logic. First, he argues that the Clean Power Plan would usurp Texas' renewable energy policy authority. The underlying policy to the Texas RPS was to establish a tradable credits system to support the market for renewable energy development. In that regard, Texas' policy has been highly successful. The Texas RPS was never meant to be a ceiling for renewable energy development; quite the contrary, it has been a floor upon which the market has been built. Texas retains its RPS in spite of the fact that the market has grown far beyond both the mandates and target of the RPS.[14] The Clean Power Plan does not disturb this approach: Texas' RPS can continue as is, providing a floor for renewable energy development in the state. The Clean Power Plan also provides Texas with the flexibility to expand its RPS to help meet its emissions targets, but the Rule does not mandate that the state do so.

17. Second, Mr. Lloyd alleges that the Texas legislature must pass legislation raising the RPS in order for any generation built after 2012 to count for compliance

[13] ERCOT, 2014 Annual Report on the Renewable Energy Trading Credit Program, https://www.texasrenewables.com/staticReports/Annual%20Report/2014%20ERCOT%20Annual%20REC%20Report.pdf

[14] Lloyd Declaration at ¶¶ 78-79.

purposes under the Rule.[15] This claim, even if correct, ignores the much broader and more important point. Legislative action has not been required in order for investors in Texas to build three times the capacity required by the Texas RPS. The renewable energy certificate tracking system has facilitated both compliance and voluntary markets, and can support the addition of new renewables without additional legislation. Given on-going market trends, renewable energy will likely be added to the Texas system and will support the state's compliance with the Clean Power Plan; a change in the Texas RPS is not required in order for that to happen.

18. In addition to establishing a state RPS, in 1999 Senate Bill 7, the Texas Legislature also established an energy efficiency goal for Texas utilities. The PUCT has successfully implemented this requirement through Substantive Rule § 25.181, which has been in effect, with amendments, since 2000. Under this policy, the PUCT establishes procedures for utilities to meet energy efficiency goals, and utilities offer energy efficiency programs to customers within their respective service territories. Programs may involve the installation of energy efficiency measures such as insulation or high efficiency lighting. Utilities can offer programs directed specifically at cities and schools to help local governments reduce operating costs and save energy.

[15] Lloyd Declaration at ¶ 80.

Utilities can also partner with independent, third-party service providers who are responsible for installing energy efficiency measures at residences and businesses.[16]

19. Like the Texas RPS, the Texas Energy Efficiency Program has been highly successful. A 2014 annual report on the program for the PUCT reported that "[i]n 2014, the majority of the Texas investor-owned utilities (IOUs) exceeded their statewide energy efficiency goals. The utilities achieved 541 gigawatt hours (GWh) of energy savings and 391 megawatts (MW) of peak demand reduction."[17] This further demonstrates that Texas is well on its way to meeting Clean Power Plan targets.

Conclusion

20. For all the reasons set forth above, it is my opinion that the declarations of Mr. Lloyd, on behalf of the Public Utility Commission of Texas, and Mr. Hyde, on behalf of the Texas Commission on Environmental Quality, fail to establish that the Clean Power Plan will cause imminent and irreparable harm during the pendency of Clean Power Plan litigation.

[16] Electric Utility Marketing Managers of Texas, "Texas Energy Efficiency" website, http://www.texasefficiency.com/index.php/utility-programs/program-basics

[17] Electric Utility Marketing Managers of Texas, Energy Efficiency Accomplishments of Texas Investor-Owned Utilities Calendar Year 2014, http://www.texasefficiency.com/images/documents/Publications/Reports/EnergyEfficiencyAccomplishments/eepr2014.pdf. Electric Utility Marketing Managers of Texas is a voluntary organization of electric investor-owned utilities formed to address utility industry energy efficiency issues.

21. I declare under penalty of perjury under the law of the United States of America that the foregoing is true and correct.

22. Executed on 7 Dec., 2015.

Karl R. Rábago

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF KATHRYN WATSON

I, Kathryn A. Watson, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors.

2. I am currently an attorney with Spalding & Hilmes, PC, in Indianapolis, Indiana. I have served in that position since June 1, 2007. I practice law with a focus exclusively on environmental law. I have been an attorney for over 33 years, and in my private practice have represented clients with regard to Clean Air Act matters. From 2010-2015 I served on the Clean Air Act Advisory Committee to U.S. EPA.

3. I served as Branch Chief for air program planning in the Indiana Department of Environmental Management from June, 1999 until May 2007.

4. As Branch Chief, my responsibilities included developing state plans to meet Clean Air Act requirements, including overseeing the development of new rules,

air quality modeling, and ensuring public participation in plan development.

5. Based on my former role as Branch Chief, I have the personal knowledge and experience to understand what steps the State of Indiana will need to undertake to implement the Clean Power Plan, including preparation of a state plan.

6. In my experience, many of the assertions made by Thomas Easterly, then-Commissioner of the Indiana Department of Environmental Management (IDEM) (the "Easterly Declaration")[1] and Keith Baugues, Assistant Commissioner of the IDEM Office of Air Quality (the "Baugues Declaration") vastly underestimate the ability of IDEM to implement and comply with federal environmental rulemakings. In my experience as Branch Chief, Indiana's environmental regulators have consistently been able to effectively and efficiently discharge the duties placed on them as part of the cooperative relationship embodied in the federal Clean Air Act.

7. IDEM has particular experience and expertise in implementing complex federal regulations under the Clean Air Act. IDEM developed state plans for the following rules applicable to electric generating units ("EGUs") during my tenure:

i. The NOx SIP Call: 63 FR 57356, October 27, 1998 and 69 FR 21604, April 21, 2004, implemented in Indiana by 326 Indiana Administrative Code §10-4-1 *et seq.*

ii. The Clean Air Interstate Rule (CAIR), 70 FR 25162, May 12, 2005, implemented in Indiana by 326 Indiana Administrative Code §24-1-1, 24-1-2 and 24-1-3 *et seq.*

[1] In August 2015, Easterly was replaced by Carol Comer as Commissioner of the Indiana Department of Environmental Management.

iii. The Clean Air Mercury Rule (CAMR), 70 FR 28606, May 18, 2005, implemented in Indiana by 326 Indiana Administrative Code §24-1-4 *et seq.*(repealed).

Each of these rules imposed a cap and trade program on EGUs, and, except for CMAR, which was invalidated by a federal court, has been implemented at the state level by IDEM staff. These rules did not require authorizing legislation because IDEM already has legislative authorization to develop rules to implement the Clean Air Act, which are adopted by the Environmental Rules Board. *See* I.C. §13-13-5-1(3); I.C. §13-14-8-2(a); I.C. §13-17-3-4(a)(2). A cap and trade program for GHG would be adopted under the same authorities and would not be substantially more complex than the cap and trade programs included in the rules cited above. IDEM would be able to deploy its considerable expertise in developing and implementing this new program. The process for rule adoption takes approximately 18 months from the time it is initiated. Thus IDEM has until early 2017 to begin the process of rule adoption, which requires only a brief notice that a rulemaking is being planned in order to initiate. IDEM can receive stakeholder input and develop and revise the rule both prior to the first notice being published and through the final hearing on the rule before the Environmental Rules Board. *See* I.C. §4-22-2 and I.C. §13-14-9 (rulemaking process)

8. Compliance with Clean Air Act rules is an integral responsibility of IDEM. Accordingly, the costs and staff required by these compliance duties are factored into the agencies' annual budget and staffing plans. Creating a state plan under the Clean Power Plan falls within these compliance duties.

9. Based on my experience as Branch Chief, Indiana has the resources, expertise and ability to develop the state plan. Many of the staff who developed state plans for the rules cited in ¶7 are still working at IDEM. IDEM does not require additional or different staff to develop the state plan under the CPP. IDEM also has on-going relationships with the Utility Regulatory Commission (IURC), the Indiana Utility Forecasting Group (IUFG), the Office of the Utility Consumer Counselor (OUCC), the Indiana Office of Energy Development (IOED), the Indiana Economic Development Corporation (IEDC) and public stakeholders, built by prior coordination and work on the previous state cap and trade programs.

10. Under the Clean Power Plan, Indiana is afforded ample time to develop a state plan. Indiana is not required to submit a state plan or conduct any interstate coordination before September 2016. The initial submission required in September 2016 requires a minimal amount of effort and planning by state authorities and does not require actual legislation or rules to be in force or even draft rules. Based on my experience and my review of the Clean Power Plan, the preparation and planning that IDEM will be required to conduct under the Clean Power Plan during the pendency of this litigation will not significantly exceed the planning duties that are often conducted by the agency in accordance with federal Clean Air Act rules. These duties include interacting with the EGUs, IOED, IURC, OUCC, IUFG, non-governmental organizations, and the public to consider options for compliance and to select the appropriate options for Indiana. The same planning and coordination occurred with the rules cited in ¶7, *supra*.

11. In light of IDEM's knowledge and experience, the agency will have

sufficient time after EPA approves its plan to meet the 2022 interim compliance deadline. EPA is required to approve or disapprove a state plan within 12 months of submission or, at the latest, September 2019—12 months after the final submission deadline. Based on my experience, the assertion in the Easterly Declaration that it is unlikely that the state plan will be approved in time for the state to meet the interim compliance deadline is inaccurate because planning by EGUs and IDEM for the compliance deadline will occur long before EPA approves Indiana's plan.

12. The final rule endorses numerous compliance paths that would not need new legislation. It is entirely speculative to say, before much planning has occurred, that new legislation will be necessary.

13. IDEM has engaged in regional multi-state planning for many years. IDEM is a member of the Lake Michigan Air Director's Consortium ("LADCO"), which provides a forum and technical assistance to the Lake Michigan states for regional air quality planning. The LADCO states include Ohio, Illinois, Michigan, Wisconsin and Minnesota, in addition to Indiana. IDEM's participation in LADCO and its long-standing relationships with the other states in the Lake Michigan region provides a foundation from which a multi-state cap and trade program could be developed. As stated in ¶7 *supra*, a cap and trade rule would not require authorizing legislation.

14. Based on my review of the Clean Power Plan, the final rule provides ample flexibility and a wide range of compliance paths to fit states' varying generation mixes and regulatory structures. Emissions trading, often cited by economists as the most cost-efficient emissions reduction measure, is favored by the plan and is part of

the federal implementation plan that Indiana can choose to adopt instead of developing and submitting its own plan.

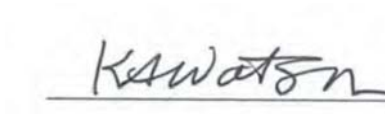
15. Based on my experience as Branch Chief, a key reason why Indiana asserts that it has insufficient time to comply with the CPP is because IDEM, unlike other states, failed prior to issuance of the CPP to undertake any planning with respect to climate change. Not only was there no planning during my tenure as Branch Chief, but IDEM was directed not to include any information about climate change on its public website. Also during my tenure, IDEM was directed not to join a voluntary climate registry that was founded by the LADCO states partly in anticipation of an eventual greenhouse gas regulatory program. Indiana was the only state in LADCO not to join "The Climate Registry." The Climate Registry was founded to establish a standard protocol for measuring and reporting greenhouse gas emissions and reductions.

16. Indiana's lack of planning for future carbon constraints is not relevant to its ability to implement the CPP. Notwithstanding the state's prior inaction, IDEM is well-situated to implement the CPP due to the long planning horizon and compliance timeframe that EPA provided in the CPP. IDEM has begun the planning process for the CPP as stated in the Baugues Declaration. I attended a stakeholder meeting held by IDEM on August 20, 2015 regarding the CPP, and at that meeting IDEM was seeking stakeholders' ideas on compliance options. If IDEM were to go forward with the planning process, based on my prior experience and the EGU rules that I developed with my staff, IDEM would establish a stakeholder workgroup to begin the planning process, establish regular meetings and agendas, and maintain that

workgroup throughout the rulemaking process. It would include EGUs, non-governmental organizations representing public interests and business interests, relevant state agencies such as the IURC, OUCC, IOED, IFUG and the IEDC and local government representatives. These groups would assist IDEM in assessing the options for compliance and developing a plan. This planning process is a part of IDEM's normal work and would not be burdensome.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Indianapolis, Indiana, on December 7, 2015.



Kathryn A. Watson

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF GEORGE MEYER

I, George Meyer, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors.

2. For thirty-two years, I served the State of Wisconsin as an employee of the Wisconsin Department of Natural Resources (WDNR). For twenty of those years I was in a senior management role, including as Secretary of the Department.

3. I represented the agency as an attorney for ten years with a focus on implementing the Clean Air Act and Clean Water Act in Wisconsin. I then became the Division Administrator for the Department's Division of Enforcement. During my twelve years as Division Administrator, I had responsibility for all of the DNR's programs dealing with conservation and environmental enforcement, environmental impact statements, water regulations, and wetland protection.

4. I was selected to be the WDNR Secretary by the Natural Resources Board in 1993 and then reappointed by Governor Thompson in 1995 and 1999, serving in the position for eight years, 1993 until 2001. When Secretary of WDNR, I served in a leadership position for the Environmental Council of the States (State Environmental Directors).

5. Based on my former role as Secretary of WDNR, I have the personal knowledge and experience to understand what steps the State of Wisconsin will need to undertake to implement the Clean Power Plan, including preparation of a state plan. I am familiar with the Clean Power Plan, its structure, and how it will be implemented by the States.

6. Based on my experience, many of the assertions made by Patrick Stevens, current Division Administrator of the Environmental Management Division, WDNR (the "Stevens Declaration") and Ellen Nowak, Chair of the Public Service Commission of Wisconsin (PSCW) (the "Nowak Declaration") exaggerate, overestimate, and misstate the duties that will be imposed on the agencies by the Clean Power Plan. These declarations also underestimate the ability of the agencies to implement and comply with federal environmental rulemakings. Based on my experience as WDNR Secretary, I can say with confidence that Wisconsin's environmental and energy regulators consistently, effectively, and efficiently administer their duties as part of the cooperative relationship established by the federal Clean Air Act and other environmental statutes.

7. WDNR is experienced with, and has particular expertise in, implementing complex federal regulations under the Clean Air Act, such as EPA's

Ambient Air Quality Standards for nitrogen oxides (NO_x), sulfur dioxide (SO_2), and ground level ozone.

8. A major responsibility of WDNR and PSCW is compliance with Clean Air Act rules. As such, the agencies' annual budget and staffing plans take into account costs and staff required by these compliance duties. The state plan required by the Clean Power Plan falls within these compliance duties.

9. Under the Clean Power Plan, Wisconsin will have ample time to develop a state plan. Wisconsin is not required to submit a state plan or conduct any interstate coordination before September 2016. The initial submission required in September 2016 requires a minimal amount of effort and planning by state authorities. Based on my experience and review of the Clean Power Plan, the preparation and planning that WDNR will be required to conduct under the Clean Power Plan during the pendency of this litigation will not significantly exceed the planning duties that are often required of the agency by federal Clean Air Act rules.

10. The WDNR successfully developed State Implementation Plans in a timely manner for highly complex new Federal regulations restricting the emissions of SO_2, NO_X, and ground level ozone. In many respects the guidance material and compliance options set out under the Clean Power Plan are far more detailed and make it less complicated to develop a state plan for compliance with the Clean Power Plan final rule.

11. EPA is required to approve or disapprove a state plan within 12 months of submission or, at the latest, September 2019—12 months after the final submission deadline. Based on my experience, EPA reviews and approves SIPs in a timely

manner if the plan submitted is adequate. The assertion in the Stevens Declaration that it is "doubtful" that the state plan will be approved and implemented by 2022 is inconsistent with my experience with EPA approvals.

12. Based on my review of the Clean Power Plan, the final rule provides ample flexibility and a wide range of compliance paths to fit states' varying generation mixes and regulatory structures. Emissions trading, often cited by economists as the most cost-efficient emissions reduction measure, are favored by the plan and are part of the federal implementation plan that Wisconsin can choose to adopt instead of developing and submitting its own plan.

13. Wisconsin has the resources and ability to dramatically increase renewable energy generation, especially from wind. A national leader in wind-related manufacturing, Wisconsin is already home to at least 26 manufacturing facilities producing components for the wind industry and has 648 MW of installed wind capacity. According to the National Renewable Energy Laboratory, Wisconsin has a land-based technical wind potential of 272,660 MW at a 110-meter hub height. (This compares with the state's entire current peak demand for electricity of approximately 17,000 MW.[1]) This projection represents an opportunity for tremendous growth for the Wisconsin wind industry, and will benefit the state economy by adding to the $1.3 billion capital investment already made in the state.

14. Assertions of lengthy lead-time are contrary to the experience in Wisconsin. Based on my experience, a wind energy generation project has one of the

[1] Public Service Commission of Wisconsin, "Electric Power Plants" (2006) (page 7), providing historical peak demand through 2006 and projections through 2012. Observed a PSC.wi.gov/thelibrary/publications/electric/electrico4.pdf.

shortest lead times from the permitting stage to becoming operational.

15. In 1999, Wisconsin enacted a renewable portfolio standard, under which utilities are required to generate 10 percent of their 2015 sales from renewable resources. Wind energy has historically been the resource chosen to meet this requirement, fulfilling 86% of RPS requirements through 2011. WDNR and PSCW have the experience and expertise necessary to shepherd renewable energy projects online.

16. Based on my experience as WDNR Secretary, no decisions will be required regarding specific retirements during 2016 to comply with the CPP. The final rule allows ample compliance flexibility, reducing or eliminating the need for legislative or regulatory changes. The rule endorses numerous compliance paths that would not need new legislation or regulation. It is entirely speculative to say, before the planning process has begun, that new legislation will be necessary.

17. Nor will the Clean Power Plan pose a serious threat to grid reliability. The final rule recognizes that a particular plant may be centrally located or needed for resource adequacy, and accordingly provides ample flexibility for a state to develop a plan to ensure that plant remains operational. Wisconsin has flexibility in its in-state system and sufficient grid capacity to import electricity from wind sources in the states of Minnesota and Iowa to meet future electrical demand in the state.

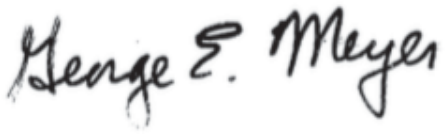
18. The final rule's reliability safety valve, which applies where the state plan's requirements conflict with maintenance of electric system reliability, is available for emergency relief to ensure reliability is maintained. As pointed out in the Nowak Declaration at ¶ 13, Wisconsin's electric generating system relies on multiple fuel

sources, resulting in a balanced portfolio. Wisconsin is thus uniquely positioned to withstand price fluctuations in any one source by shifting generation to a more stable source. This balanced portfolio approach will temper any near-term price changes that result from implementation of the Clean Power Plan.

19. The PSCW is experienced in conducting interstate coordination regarding environmental matters and electricity generation. PSCW is a member of the Organization of Midcontinent Independent System Operator (MISO) (OMS), a self-governing organization of representatives from each state with regulatory jurisdiction over entities participating in the Midcontinent ISO. The purpose of OMS is to coordinate regulatory oversight among the MISO states, including making recommendations to various government entities.[2] As part of its membership in OMS, PSCW, in coordination with WNDR, participates in a number of working groups focused on interstate coordination to implement federal regulations, among other objectives.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Madison, WI, on December 1, 2015.



George Meyer

[2] Organization of MISO States, http://www.misostates.org.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF BARBARA ROBERTS

I, Barbara Roberts, declare as follows:

1. I have extensive experience working on air quality planning and management and energy policy—both as a state and federal official. Most recently, I served on the Colorado Air Quality Control Commission, the expert board with regulatory authority to protect air quality in Colorado. I served on the Commission for 6 years, including as Chair between 2009 and 2013. In addition, from 1982 to 1990, I served as the Assistant Attorney General of Utah for the Division of Oil, Gas and Mining, which, among other things, is

charged with addressing environmental impacts associated with development of these resources.

2. At the Federal level, I served in the Environmental Protection Agency (EPA) during both the William J. Clinton and George W. Bush Administrations, where I was Senior Policy Advisor to the Assistant Administrator for the Office of Air and Radiation. The Office of Air and Radiation is the office within EPA charged with developing national programs, policies, and standards for controlling air emissions. I also advised members of both the House and Senate on environmental and energy issues, including as Counsel for the Senate Committee on Environment & Public Works, where I developed deep knowledge of critically important national air quality policies.

3. My over 30 years of experience has helped me develop legal, technical, administrative, and legislative expertise related to the development of air quality policies, including policies to address greenhouse gas emissions. For instance, during my time as the Chair of the Colorado Air Quality Control Commission, I shepherded passage of rules related to the Colorado Clean Air Clean Jobs Act—an integrated, multipollutant, system-wide approach designed to reduce pollution from the power sector in light of existing and reasonably foreseeable federal regulations. Moreover, while with the Senate and at EPA, I was engaged with the development of policies addressing the nationwide reduction in regional haze and new national standards for PM2.5 and Ozone NAAQS. Through these experiences, I developed a deep understanding of emissions

from the power sector and effective state and federal approaches to reducing those emissions.

4. In addition, my experiences underscore the highly-effective federal-state partnership to reducing air pollution embodied in the Clean Air Act. Under this cooperative federalism framework, the federal and state governments have vital, complementary roles in securing air quality improvements. During my time at the Colorado Air Quality Control Commission, I worked to develop state implementation plans to ensure compliance with federal health-based standards for pollutants like particulate matter and ozone. This time tested approach—where the federal government establishes minimum standards and then states choose how best to meet those standards—has worked to cost-effectively reduce pollution from significant sources, including power plants, over the last four decades.

Colorado Multi-Pollutant Planning

5. Colorado has a long history of taking action to reduce the suite of air pollutants from the power sector and of pursuing low-carbon solutions for energy generation within the state.

6. For instance, as Chair of the Colorado Air Quality Control Commission, I presided over the implementation of the Colorado Clean Air Clean Jobs Act—a coordinated, multipollutant air quality planning and management program designed to ensure that Colorado was complying with existing Clean Air Act

obligations while also taking into account reasonably foreseeable Clean Air Act requirements. The Clean Air Clean Jobs Act embodied a holistic, system-wide approach that optimized investments and achieved multipollutant emission reductions from the power sector, reducing in a flexible way toxic mercury, soot-forming pollution and smog-causing emissions at power plants across the Colorado Front Range by over 80 percent and reducing carbon dioxide emissions from coal plants across the Public Service Company of Colorado system by 35 percent over 2005 levels.

7. There was bipartisan support for such an approach in the state legislature, which recognized that "[a] coordinated plan of emission reductions from these coal-fired power plants will enable Colorado rate-regulated utilities to meet the requirements of the federal act and protect public health and the environment at a lower cost than a piecemeal approach" and, in addition, that such an approach "will . . . result in reductions in many air pollutants . . . ."[1] Moreover, each member of Colorado's bipartisan congressional delegation expressed strong support for the flexible approach embodied in the Clean Air Clean Jobs Act. This included then-Representative and now Republican Senator Gardner, who noted that the approach "has had broad, bi-partisan support and will

[1] C.R.S. § 40-3.2-202(1).

enhance visibility through the reduction in various emissions across Colorado."[2]

8. In addition, Colorado has a long-standing commitment to low carbon solutions for the power sector, which began with a 2004 ballot initiative resulting in the first voter-led Renewable Energy Standard in the nation.[3] The Colorado legislature has since increased the Renewable Energy Standard three times. House Bill 07-1281, passed in 2007, doubled the RES from 10% to 20% for investor-owned utilities and instituted a 10% goal for rural electric coops and municipal electric utilities by 2020.[4] House Bill 10-1001, passed in 2010, requires investor-owned utilities to generate 30% of their electricity from renewable energy by 2020 and required that 3% of all electric sales come from renewable distributed generation energy resources by 2020.[5] Most recently, Senate Bill 252, which was passed in 2013, requires cooperative utilities to generate 20% of their electricity from renewable energy sources by 2020.[6]

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[2] Office of Senator Michael Bennet, "EPA Gives Initial Approval to Colorado's Plan-Backed by Delegation-to Reduce Regional Haze Pollution," (March 9, 2012), *available at* http://www.bennet.senate.gov/?p=release&id=1466.

[3] Governor's Energy Office, COLORADO'S 30% RENEWABLE ENERGY STANDARD: POLICY DESIGN AND NEW MARKETS 2 ("GEO report") (August 2010), *available at* http://cnee.colostate.edu/graphics/uploads/HB10-1001-Colorados-30-percent-Renewable-Energy-Standard.pdf.

[4] GEO report at 2.

[5] *Id*.

[6] SB 13-252 (June 5, 2013), *available at* http://www.leg.state.co.us/clics/clics2013a/csl.nsf/fsbillcont/D1B329AEB8681D4D87257B3900716761?Open&file=252_enr.pdf.

Colorado is Well-Positioned to Comply with the Clean Power Plan

9. As a consequence of these policies and the tremendous flexibility afforded states to design a plan that is tailored to the state's unique circumstances and priorities, Colorado is well positioned for compliance with the Clean Power Plan.

10. Much like the system-wide, flexible approach embodied in the Clean Air Clean Jobs Act, the Clean Power Plan affords states considerable flexibility in designing and implementing a plan to reduce carbon emissions from the power sector. The Clean Power Plan includes uniform rates for coal and natural gas plants, which EPA established by applying three building blocks to each of three regional interconnects. Building Block 1 involves improving the efficiency of existing coal-fired steam power plants, so that they emit less carbon pollution per unit of electricity produced. Building Block 2 involves gradually shifting generation from high-emitting coal and oil-fired steam power plants to lower-emitting power plants fueled by natural gas, over the time period from 2022-2030. Building Block 3 involves gradually shifting generation from all fossil fuel-fired power plants, including coal and gas-fired units, to zero-emitting, utility-scale renewable resources including wind, solar, and geothermal power.

11. Importantly, however, states are not required to implement the specific measures reflected in the building blocks, but instead can choose from among a large number of proven solutions to reduce carbon emissions from the power sector. For example, energy efficiency measures can reduce emissions and directly benefit consumers by lowering energy bills, and a recent report by the National Association of Clean Air Agencies has highlighted additional, available measures that can be deployed in meeting emission limits.[7] Moreover, in designing these plans, states can likewise choose to adopt compliance measures that include flexibilities like trading, which can further maximize environmental benefits and minimize costs.

12. The Clean Power Plan likewise gives states the option of adopting one of four different carbon pollution limits that must be met by 2030, including (1) applying the Clean Power Plan's national emissions standards for coal and oil-fired steam generating units and natural gas-fired stationary combustion turbines to the affected fossil fuel-fired power plants in the state; (2) adopting a weighted average of these rates (i.e. a "rate-based goal"); (3) adopting an EPA-established "mass-based goal" for existing fossil fuel-fired power plants in the state, expressed in terms of total emissions of CO2 per year; and (4) adopting a mass-based budget that applies to both existing and new fossil fuel-fired power

[7] National Association of Clean Air Agencies, IMPLEMENTING EPA'S CLEAN POWER PLAN: A MENU OF OPTIONS (May 2015), *available at* http://www.4cleanair.org/sites/default/files/Documents/NACAA_Menu_of_Options_HR.pdf.

plants in the state. In addition, states have flexibility with respect to timing. The interim compliance period begins over six years from now, in 2022, and states can customize a compliance glide path post 2022 so long as they (1) meet an EPA-established "interim goal" on average from 2022 to 2029 and (2) meet their final goal in 2030.

13. Coupled with this flexible architecture, Colorado's existing policies—along with planned investments and already announced retirements—ensure that the state is well-positioned to comply with the Clean Power Plan. Analysis conducted by M.J. Bradley & Associates for the Environmental Defense Fund considered these investments in new generation; announced retirements (independent of the Clean Power Plan); and existing state policies like renewable portfolio standards, which were assumed to continue at current levels. The resulting scenarios therefore represent "business-as-usual" or "planned" investments by industry combined with implementation of existing policies in the movant states. This analysis finds that deploying these new investments in a way that maximizes carbon reductions could bring Colorado into compliance with the Clean Power Plan all of the way through 2030. See Munns decl. The manner in which these resources are deployed, however, will significantly impact emissions outcomes and, for this reason, the Clean Power Plan is essential to providing the right signals to ensure that the nation fully harnesses this opportunity to address harmful carbon pollution.

14. Moreover, before the Clean Power Plan was proposed, a leading power company in Colorado highlighted its progress in swiftly and cost-effectively integrating renewables onto the grid and in lowering carbon pollution at a scope and pace exceeding the national carbon emissions reduction goal: "Xcel Energy announced today that, as of 2013, it has reduced carbon dioxide emissions by nearly 20 percent since 2005, already exceeding President Obama's goal of a 17 percent reduction by 2020."[8] The CEO of Xcel Energy Inc., Ben Fowke, underscored the competitiveness of wind and solar energy: "in 2013, Xcel Energy announced plans to add another 1900 megawatts of wind energy and 170 megawatts of solar energy to its portfolio, all at prices below fossil fuel alternatives."[9] A recent study documented these benefits for Colorado consumers, finding that Xcel's wind purchases saved consumers $251 million on net and further wind purchases would save a net total of $438 million.[10]

[8] *Xcel Energy Surpasses National Carbon Emissions Reduction Goal*, http://www.xcelenergy.com/Company/About_Xcel_Energy/Media_Room/News_Releases/Xcel_Energy_surpasses_national_carbon_emissions_reduction_goal (last visited Dec. 4, 2015).

[9] *Xcel Energy Surpasses National Carbon Emissions Reduction Goal*, http://www.xcelenergy.com/Company/About_Xcel_Energy/Media_Room/News_Releases/Xcel_Energy_surpasses_national_carbon_emissions_reduction_goal (last visited Dec. 4, 2015).

[10] American Wind Energy Association, WIND POWER'S CONSUMER BENEFITS (February 2014), *available at* http://awea.files.cms-plus.com/AWEA%20White%20Paper-Consumer%20Benefits%20final.pdf.

Colorado is Already Deploying Solutions on which the Clean Power Plan is Founded

15. Colorado's electricity portfolio has historically been dominated by fossil fuel facilities. As recently as 2005, 96% of Colorado's generation came from fossil fuel-fired power plants, with 72% coming just from coal plants.[11] Despite this traditional reliance on fossil fuels, Colorado has been shifting its utilization from high- to low-emitting resources for years and doing so cost-effectively by leveraging greater investments in renewable energy, energy efficiency and replacement of high-emitting plants with lower-emitting plants. The Clean Air Clean Jobs Act helped to catalyze deployment of these solutions and they are some of the very same measures EPA analyzed in developing the Clean Power Plan's emission limits.

16. As of 2014, generation in Colorado from fossil fuel-fired power plants has decreased to 83% of our electricity portfolio, with 60% coming from coal plants—a 12% drop from 2005.[12] In addition, Colorado has steadily increased its reliance on wind, solar, and other renewable energy resources over the last decade. In 2014, Colorado obtained 13% of the electricity generated in state

[11] U.S. Energy Information Administration, NET GENERATION BY STATE BY TYPE OF PRODUCER BY ENERGY SOURCE (EIA-906, EIA-920, AND EIA-923) (November 2015), *available at* https://www.eia.gov/electricity/data/state/.
[12] *Id*.

from wind.[13] Colorado has also installed 412 MW of solar capacity as of 2015, making it the 9th ranked state in the nation for installed solar capacity.[14]

17. As part of the implementation of the Clean Air Clean Jobs Act, Xcel Energy committed to retiring six coal-fired Electric Generating Units, switching from utilization of high-emitting to low-emitting resources at one additional Electric Generating Unit and adding controls to reduce emissions of multiple pollutants at three others.[15] Xcel proposed these improvements to produce "cleaner air and continued electric reliability at a low cost."[16] In addition, between 2011 and 2020 Xcel projects its use of coal to drop from accounting for 69% of its fuel sources to 48%, while its utilization of renewables will rise from 14% to 29% of total fuel sources and its use of natural gas will increase from 17% to 23%.[17]

18. Another power provider in Colorado, Tri-State Generation and Transmission Association Inc., also recently addressed its efforts to integrate renewables into the grid. In February 2014, Brad Nebergall, Tri-State's senior vice president,

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[13] Colorado Energy Office, RENEWABLE ENERGY, *available at* https://www.colorado.gov/pacific/energyoffice/renewable-energy-1 (last visited December 2, 2015).
[14] *Id.*
[15] Xcel Energy, COLORADO CLEAN AIR-CLEAN JOBS PLACEMAT, *available at* https://www.xcelenergy.com/staticfiles/xe/Corporate/Environment/CACJ%20Placemat.pdf.
[16] *Id.*
[17] *Id.*

said the Carousel Wind Farm in Kit Carson County was a "timely and cost-effective opportunity for us to diversify our generation fleet."[18]

Colorado is Moving Forward with Stakeholder Process to Develop a Plan and Doing So Recognizing Traditional Roles of the Colorado Department of Public Health and the Environment and the Colorado Public Utility Commission.

19. Colorado has already made significant progress toward developing its state plan, undertaking a public engagement effort to assure that the planning effort is informed and guided by key Colorado stakeholders and the broader public. The Colorado Department of Public Health and the Environment has solicited public comments at two public meetings[19] and is organizing additional opportunities for public engagement in the coming months. This process promotes Colorado's priorities, including stakeholder input and collaboration among state agencies.[20] Consistent with its responsibilities, the Colorado Air Quality Control Commission provides for the establishment of emissions standards based on the expert recommendations of the Department of Public Health and the Environment and extensive opportunity for public input and engagement. In accordance with its long-standing role, the Public Utility Commission assesses the prudency of utility investments that are necessary to comply with the required emissions standards while ensuring cost-effective reliable electricity.

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[18] *Tri-State to Buy Power from New Colorado Wind Farm*, Denver Business Journal, http://www.bizjournals.com/denver/blog/earth_to_power/2014/02/tri-state-to-buy-power-from-new-150.html (last visited November 30, 2015).

[19] *See* CDPHE, *Clean Power Plan*, https://www.colorado.gov/pacific/cdphe/CleanPowerPlan (last visited Nov. 30, 2015).

[20] *See* CDPHE, CLEAN POWER PLAN: DEVELOPMENT OF COLORADO'S 111(D) STATE PLAN 6 (Sept. 25, 2015), *available at* https://www.colorado.gov/pacific/sites/default/files/AP_PO_CPPpresentationSept25.pdf.

Colorado's Governor Likewise Recognizes the State is Well-Positioned And Expressly Asked Colorado's Attorney General Not to Challenge the Clean Power Plan

20. Governor Hickenlooper has repeatedly acknowledged that Colorado is well-positioned to implement the Clean Power Plan, stating "[w]e continue to move forward with plans to ensure Colorado has the cleanest air in the nation, and our state agencies are working together toward that goal. We've already accomplished much with Clean Air Clean Jobs. And while we realize there is more work to do, we are confident we can reach our goal."[21]

21. As a result, the Governor's Chief Legal Counsel communicated to the Colorado Attorney General's office that "[t]he Governor has considered these rules and the overall plan carefully and has concluded that the State of Colorado should not be made a party to any lawsuit challenging the new rules." (emphasis in original).[22] The communication explains that the Governor "believes the public interest is better served by an open, inclusive process to implement the Clean Power Plan than it is by policy dictated through costly, time-consuming, and unpredictable litigation"[23] as "Colorado is well positioned to meet its carbon reduction target," "[m]any Colorado utilities are already on

[21] *Colorado attorney general to join in suit on Obama's Clean Power Plan*, The Denver Post (August 29, 2015), http://www.denverpost.com/news/ci_28725098/colorado-attorney-general-to-join-in-suit-on-obamas-clean-power-plan.
[22] Letter from Jacki Cooper Melmed, Chief Legal Counsel, Office of the Governor to David Blake, Oct. 21, 2015.
[23] *Id*.

track to meet the emissions reductions required by the EPA" and Colorado has "accomplished all of this while keeping energy rates affordable."[24] The correspondence underscores that Colorado "has taken significant steps to reduce carbon emissions, including retiring or re-powering coal-fired units, increasing renewable energy use and energy efficiency, and reducing energy demand."[25]

Colorado's Leadership and EPA's Clean Power Plan are Hallmarks of Cooperative Federalism.

22. As discussed above, Colorado has been providing state-based clean air solutions for decades that have proven both durable and highly cost-effective. This includes pursuing integrated, multi-pollutant planning and shifting electricity generation across its system from high- to low-emitting resources. EPA's Clean Power Plan creates a flexible framework that allows states to deploy these (and many other) solutions. This flexibility and Colorado's history of leadership in this field will allow the state to implement state-based clean air solutions that continue to reflect Colorado's own unique circumstances.

[24] *Id.*
[25] *Id.*

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 6th day of December, 2015.



Barbara Roberts

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	Case No. 15-1363 et al.

DECLARATION OF JEANNE M. FOX

I, Jeanne M. Fox, declare as follows:

1. I served as President of the New Jersey Board of Public Utilities ("BPU") from 2002–2010; as a Commissioner of the BPU from 2002–2014; as Acting Commissioner and Deputy Commissioner of the New Jersey Department of Environmental Protection ("DEP") from 1991–1994; and as a Regional Administrator for the United States Environmental Protection Agency ("EPA") for Region II from 1994–2001. During my time as Regional

Administrator, I oversaw the implementation of EPA-administered regulatory programs in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands.

2. I am an Adjunct Professor in the Energy and Environment Concentration at the Columbia University School of International and Public Affairs, 420 West 118th Street, New York, New York, 10027. I have a J.D. and a B.A. from Rutgers University.

3. This declaration is based on my thirty-five years of experience in utility, environmental, and energy regulation at both the state and federal level. In my cabinet-level position at the New Jersey BPU, I was responsible for implementing statutes governing utility operations and rates, ensuring an affordable and reliable power supply, and overseeing public participation in the state energy planning process. As Acting Commissioner of the state DEP, and Regional Administrator of EPA, I oversaw the implementation of Clean Air Act programs including air pollution control permitting; air quality planning; and development of state implementation plans.

4. My background includes multi-state coordination on energy and environmental policy. I was a founding member of the group of state utility commissions and environmental protection agencies that developed the 2005 Memorandum of Understanding among the states of Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont, which committed each of the signatory states to propose, for legislative and/or regulatory approval, a program to stabilize and then reduce carbon dioxide emissions from fossil fuel-fired electric generating units with rated capacity of at least 25 megawatts. This

program, the Regional Greenhouse Gas Initiative ("RGGI"), is a mass-based greenhouse gas emissions trading program that applied to electric generating units ("EGUs") in New Jersey from January 2009 through December 2011 (and continues to apply to EGUs in nine other states).

5. I represented New Jersey during the design and initial implementation of that multistate carbon pollution reduction effort. That effort included the successful development of an overall regional emissions cap among the signatory states, state-by-state emissions caps for each signatory state, and other key implementation steps that are set forth in the 2005 Memorandum of Understanding.

6. I also served as President of the Mid-Atlantic Conference of Regulatory Utility Commissioners (2007–2008) and as Chair of the National Association of Regulatory Utility Commissioners' Committee on Energy Resources and the Environment (2010–2013).

7. I have facilitated numerous complex regulatory and public participation proceedings during my career. Among other things, I served as Chair of the 2008 New Jersey Energy Master Plan Committee, which involved a statewide public engagement process. Beginning in 2002, I also led statewide hearings on the use of clean energy funds collected pursuant to New Jersey's Electric Discount and Energy Competition Act. I also chaired the New Jersey Renewable Energy Task Force created by Governor James E. McGreevey to increase the deployment of renewable energy in New Jersey. I also presided over a series of regulatory improvements to New Jersey's statutory renewable

energy portfolio standards that dramatically accelerated the development of solar energy in New Jersey.

New Jersey Has Already Demonstrated the Capability to Develop a Greenhouse Gas Reduction Program for the Power Sector

8. New Jersey is well-positioned to develop a state plan that meets the requirements of the Clean Power Plan ("CPP"), and to do so before the deadline of September 6, 2018. Declarants for the State of New Jersey mischaracterize the requirements of the CPP, alleging that it is "extremely complex, time-consuming and costly," Martin Decl. ¶ 8; requires "an implementation effort that exceeds all others previously undertaken by DEP," *id.*; calls on New Jersey to "regulate activities beyond the EGUs' physical boundaries," *id.* ¶ 12; and requires legislative changes to amend the state's clean energy programs and broaden the authority of the BPU, *see* Mroz Decl. ¶¶ 4–6. As I describe below, these assertions are incorrect. In fact, New Jersey has already developed and implemented major regulatory programs that establish state-wide emission limitations, and associated emissions trading programs, for greenhouse gases and other pollutants from the state's existing EGUs. These programs are closely analogous to the mass-based state plans outlined by EPA in the CPP.

9. New Jersey's past participation in RGGI demonstrates that planning and implementation of a program to reduce carbon dioxide emissions from the state's power sector is eminently feasible. New Jersey was a founding member of RGGI, which was established under a multistate memorandum of

understanding ("MOU") in 2005. Legislation authorizing the State's participation in RGGI's emission trading program was passed by the legislature in about two months.[1] Regulations implementing RGGI were proposed by DEP in July 2008, in consultation with the BPU. After a comment period, these regulations were finalized in November of the same year. Program implementation started soon thereafter on January 1, 2009, and New Jersey's EGUs remained in compliance with RGGI for three full years before the state unilaterally withdrew from the program effective January 1, 2012. The assertion that New Jersey cannot "properly consider whether emission trading is even a viable option" until EPA finalizes model trading rules, Martin Decl. ¶ 6, is directly contradicted by this recent experience.

10. Regulators and EGUs in New Jersey also have experience administering and complying with an evolving set of emissions trading programs for non-greenhouse gas emissions that have applied to the power sector since 1999 and that similarly provide suitable templates for a mass-based compliance framework for the CPP. For example, in 1999, New Jersey implemented its NO_x Budget Program to reduce emissions of oxides of nitrogen from New Jersey electric generating units, using an emissions trading program. New Jersey's state plan implementing EPA's NO_x SIP Call – another Clean Air Act regulation that required states to develop plans to implement state-wide

[1] Legislation clarifying the authority of New Jersey officials to participate in RGGI's governing institutions, and clarifying other aspects of implementation of RGGI in New Jersey, was filed in November 2007 and signed into law in January 2008. *See* P.L.2007, c.340.

emission limits for EGUs—established a state-wide emission budget and emissions trading program for oxides of nitrogen in New Jersey EGUs beginning in 2003. Under EPA's Clean Air Interstate Rule ("CAIR"), promulgated in 2005, New Jersey adopted emissions budgets and emissions trading programs for both nitrogen oxides and sulfur dioxide from EGUs. And in early 2015, New Jersey EGUs became subject to a similar emissions trading program adopted by EPA under the Cross-State Air Pollution Rule, which replaced CAIR.

11. New Jersey could adopt a similar emissions trading program, or rejoin RGGI, in order to ensure its EGUs comply with the CPP.[2] There is no basis for the assertion that new legislative authority would be required to implement the CPP, *see* Mroz Decl. ¶¶ 5–6. The statutory authority that allowed New Jersey to participate in RGGI remains in place,[3] and state regulators and owners and operators of existing EGUs in the state are familiar with RGGI's structure and rules as well as similar Clean Air Act emissions trading programs noted above. New Jersey could rejoin RGGI merely by re-signing the multistate MOU and reinstating the implementing regulations. Based on my involvement with the initial RGGI rulemakings, I estimate that the regulations necessary for

[2] The preamble to the CPP notes that a state plan could be based on RGGI itself or a similar mass-based emissions trading program. *See* Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662, 64,855 n.837 (Oct. 23, 2015) (noting that RGGI states could submit a final state plan ". . . .which largely contains or relies upon such existing programs."),

[3] *See* N.J. Stat. §§ 26:2C-45 through -57.

renewing participation in RGGI could be re-proposed and finalized within eighteen months.

12. The declarants for the State of New Jersey largely overlook these compliance options, instead alleging that the State would need to develop a complex "customized trading rule that includes offshore wind, landfill gas recovery" and other specific technologies. Martin Decl. ¶ 10. Such technology-specific credits are not necessary under a mass-based compliance framework like RGGI. Mass-based programs limit total stack emissions of carbon dioxide from affected EGUs and do not require separate crediting of renewable energy, energy efficiency or other mechanisms for keeping emissions within those limits.

13. Even if New Jersey were to adopt a rate-based state plan instead, the state has already demonstrated that the necessary regulatory infrastructure would be straightforward to develop. New Jersey state law already provides for the generation of technology-specific renewable energy credits for solar photovoltaic facilities ("SRECs") and offshore wind ("ORECs"),[4] along with generic Renewable Energy Credits for other technologies – all for purposes of implementing the state's Renewable Portfolio Standard ("RPS"), described below. The state also participates in PJM Environmental Information Services' Generation Attribute Tracking System, which tracks a wide variety of renewable energy credits, including SRECs, at the regional level. A system of emission reduction credits allowing EGUs to claim credit for zero-carbon generation could build on these existing tracking and trading mechanisms and

[4] *See* N.J. Stat. § 48:3-87(d)(4) (requiring creation of OREC program).

would be informed by New Jersey's extensive experience and expertise in this area.

14. Concerns over the timing of the state planning requirements under the CPP are similarly mistaken. *See* Martin Decl. ¶ 5. EPA has provided until September 6, 2018 – a time period of almost three years – for states to prepare plans that implement the CPP. This timeframe is commensurate with prior Clean Air Act programs of similar or greater complexity, and based on my experience should be sufficient. As discussed above, New Jersey developed its own NO_x emissions trading program, and modified its program to conform to the EPA's NO_x SIP Call – which similarly required states to develop plans to implement state-wide emission limits for EGUs – just fourteen months after the EPA regulation was finalized.[5] New Jersey also proposed and finalized a state plan implementing the Clean Air Interstate Rule – which also prescribed state-wide emission limitations for the state's EGUs – in less than two years.[6] In the late

[5] New Jersey's state plan implementing the NO_x SIP Call was submitted on December 10, 1999, approximately 14 months after the promulgation of the NO_x SIP Call. New Jersey made a follow-up submission on July 31, 2000. EPA approved New Jersey's plan approximately 10 months later. *See* Approval and Promulgation of Implementation Plans; New Jersey; Nitrogen Oxides Budget and Allowance Trading Program, 66 Fed. Reg. 28,063, 28,064 (May 22, 2001).

[6] EPA finalized the Clean Air Interstate Rule on May 12, 2005, and finalized New Jersey's inclusion in CAIR in April 2006. *See* Inclusion of Delaware and New Jersey in the Clean Air Interstate Rule, 71 Fed. Reg. 25,288 (Apr. 28, 2006). The New Jersey Department of Environmental Protection proposed state implementation plan revisions to comply with CAIR on February 5, 2007 and finalized those revisions just four months later on June 21, 2007. *See* http://www.state.nj.us/dep/aqm/CAIR_adoption.pdf.

1980s and early 1990s, New Jersey submitted – and EPA approved – revisions to its implementation plan for addressing statewide ozone emissions at least annually.[7] New Jersey can prepare its CPP state plan using the same well-established regulatory process that has proven successful for these Clean Air Act programs.

15. New Jersey has also completed other complex administrative proceedings in fewer than three years. Soon after I began my tenure as President of the BPU, the BPU established a new Office of Clean Energy to oversee state clean energy programs and a new advisory Clean Energy Council within the BPU. This process was initiated and completed between 2002 and 2003, including statewide public hearings. Similarly, New Jersey needed just three years to develop and establish its SREC program, under which the state established incentives for solar energy that have played an important role in New Jersey's achievement of the second-highest solar photovoltaic capacity in the U.S.[8] And as noted above, the regulatory proceedings to implement RGGI were completed in a matter of months.

16. Contrary to assertions that state planning for the CPP would require burdensome coordination among state agencies, *see* Martin Decl. ¶¶ 8–9, interaction among agencies is already routine. As Acting Commissioner of

[7] *See, e.g.*, 59 Fed. Reg. 49,208 (Sep. 27, 1994); *id.* at 17,933 (Apr. 15, 1994); 58 Fed. Reg. 29,975 (May 25, 1993); 57 Fed. Reg. 53,440 (Nov. 10, 1992); *id.* at 42,892 (Sep. 17, 1992); 56 Fed. Reg. 12,450 (Mar. 26, 1991); 55 Fed. Reg. 26,687 (June 29, 1990); 54 Fed. Reg. 25,572 (June 16, 1989).

[8] *See* Nat'l Renewable Energy Lab., *Open PV Project*, https://openpv.nrel.gov/rankings (last visited Nov. 13, 2015).

DEP and President of the BPU, I observed significant collaboration between these agencies on a wide range of issues, including rulemakings to implement greenhouse gas emission limits. In 2010, the Governor moved the BPU headquarters from Newark to Trenton, partly to better facilitate coordination with DEP. The BPU is also in frequent contact with PJM Interconnection regarding the reliability and coordination issues movants allege would necessitate coordination under the CPP. There is also a strong working relationship among public utilities commissioners in the region, facilitated by organizations such as the Organization of PJM States and the Mid-Atlantic Distributed Resources Initiative.

17. The implementation of the CPP will not require that the state legislature grant the BPU new powers. The BPU will not, as movants assert, need authority to mandate the construction of power plants, require EGUs to enter into power purchase agreements, or otherwise "direct the actions of existing generators." Mroz Decl. ¶ 4b. As New Jersey's experience with RGGI shows, a properly structured emissions trading program will integrate seamlessly with the regional competitive electricity markets and provide appropriate economic incentives for EGUs to reduce emissions – without any need for central planning or direction from the BPU. Under the Clean Power Plan, owners and operators of EGUs will continue to make decisions about the amount and type of generation to construct and operate under the traditional electricity dispatch system, discussed further below, which takes into account a wide array of economic and regulatory considerations. As I explain below, BPU also has

existing programs and legal authorities that encourage demand-side measures such as energy efficiency and that would continue to be available under the Clean Power Plan.

Existing Opportunities for Fulfilling the Clean Power Plan

18. Due to New Jersey's investments in renewable energy, energy efficiency, and other clean energy programs over the last fifteen years, EGUs in the state are well-positioned to comply with the Clean Power Plan. The assertion that "EPA's proposed compliance options already have been fully utilized in NJ," Martin Decl. ¶ 14, is untrue. For example, New Jersey's RPS – like those in many other states – requires retail suppliers of electricity to ensure that an increasing percentage of sales derive from renewable energy over time. New Jersey's RPS is one of the strongest in the country, and already requires that 22.5% of sales derive from renewables by 2020–2021. The RPS can be met with in-state resources as well as out-of-state resources that are connected to the PJM system, though electricity generated from solar and offshore wind must be connected to the state's distribution system and electrical transmission system, respectively.

19. New Jersey's highly successful SREC program, mentioned above, has also incentivized the deployment of significant quantities of renewable energy in the state. As a result of the SREC program, New Jersey now has over 40,000 solar energy installations comprising over 1.5 Gigawatts of installed capacity.[9] Net

[9] *See* New Jersey's Clean Energy Program, New Jersey Solar Installation Update, http://www.njcleanenergy.com/renewable-energy/project-activity-

electric generation from solar power has also grown swiftly, from 3 Gigawatt-hours ("GWh") in 2008 to 677 GWh in 2014 – making New Jersey the fifth largest solar-generating state in the country. Under New Jersey law, the proportion of electricity derived from solar power must steadily increase, until reaching 4.1% in 2028.[10] New Jersey's experience has demonstrated that the state can seamlessly integrate these new resources into its existing electricity grid without negatively impacting electricity reliability or affordability.

20. New Jersey also has existing programs to promote energy efficiency, which is a highly cost-effective means of reducing electric generation and associated emissions that also directly benefits consumers. The BPU, in consultation with DEP, sets a societal benefits charge ("SBC") on electric bills that is intended to finance clean energy investments. Most of this funding, set at $344 million in FY 2015, is collected to support demand-side energy efficiency programs.[11] Although the state has diverted approximately $1 billion of this money to the general fund since 2010,[12] the SBC remains available for its originally intended purpose, without the need for any additional legislation or regulatory activity. In addition, if the state decided to pursue an energy efficiency portfolio standard to facilitate compliance with the CPP, the BPU is already authorized

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reports/installation-summary-by-technology/solar-installation-projects (last visited Nov. 13, 2015).

[10] *See* N.J. Stat. § 48:3-87(d).

[11] *See id.* § 48:3-60.

[12] *See* Allan Sloan & Cezary Podkul, *Chris Christie's Budget 'Sins' in New Jersey*, Wash. Post. (Apr. 17, 2015), https://www.washingtonpost.com/news/post-politics/wp/2015/04/17/chris-christies-budget-sins-in-new-jersey/.

under existing state law to establish a standard that would mandate that the state's retail electricity providers procure specified amounts of energy efficiency or demand-side resources.[13]

21. In 2008, the state performed extensive analysis showing that continued, rapid deployment of clean energy by 2020 was feasible. This analysis was included in the Energy Master Plan ("EMP"), which the state is required by statute to produce every few years. The 2008 EMP remains a powerful illustration of New Jersey's clean energy potential. Among other things, the report concluded that 30% of New Jersey's electricity could be feasibly derived from renewable resources by 2020, far in excess of the state's RPS requirement of 22.5%. This EMP further concluded that increased deployment of end-use energy efficiency projects – which reduce consumer electricity bills while also reducing the need for high-emitting electricity generation – could reduce electricity demand by approximately 20% by 2020.

22. The EMP also found that New Jersey has tremendous potential for wind energy and aimed to support the development of 3,000 Megawatts of offshore wind capacity by 2020, supplying up to 13% of the state's energy needs. Some large-scale projects are now moving ahead. On November 9, 2015, the U.S. Department of Interior announced that it had provisionally awarded leases for

[13] *See* N.J. Stat. § 48:3-87(g).

an area off the New Jersey coast with the potential for up to 3,400 Megawatts of offshore wind capacity.[14]

23. Neither has New Jersey been penalized for past investments in clean energy. *See* Martin Decl. ¶ 14. To the extent that existing clean energy resources have displaced and continue to displace fossil fuel-fired generation in New Jersey, these investments are causing overall emissions and fossil generation to be lower than they otherwise would be. New Jersey's prior efforts are helping the state come closer to meeting both the rate and mass-based emission targets for the Clean Power Plan. The state's existing policies are also driving investment in additional clean energy resources, which could further reduce fossil generation and associated emissions from New Jersey EGUs – assisting with compliance with either a mass- or rate-based emission target.

24. Assertions that New Jersey would need to modify its existing clean energy programs, such as SRECs and the RPS, in order to comply with the Clean Power Plan are also unfounded. *See* Mroz Decl. ¶¶ 6–7. EGUs in New Jersey could utilize clean energy to meet Clean Power Plan requirements without any change to existing programs. Under a mass-based program like RGGI, renewables and energy efficiency would displace high-emitting generation and facilitate achievement of the mass-based limits, without requiring special

[14] On November 20, 2015, BPU released a Draft Energy Master Plan Update. The Update reaffirms the New Jersey's commitment to achieving the RPS of 22.5% by 2020 and notes that the RPS will increase to 24.39% by 2028, including the increasing requirement for solar energy. The Update also recognized significant potential for electricity from biomass, combined heat and power, and energy efficiency, all of which could contribute to compliance with the Clean Power Plan.

crediting of those resources or interfering in any way with the RPS. Under a rate-based program, New Jersey could leverage the well-established and familiar RPS systems for verifying, tracking, and crediting renewable energy to create a CPP-specific system of emission reduction credits.

25. The Martin Declaration refers to studies by the U.S. Chamber of Commerce and others to claim that the CPP will have exorbitant costs for New Jersey. *See* Martin Decl. ¶¶ 16, 18. However, the U.S. Chamber of Commerce study was released in May 2014, before the CPP was even proposed. The Fitch report cited in the Martin Declaration was issued in January 2015, seven months before release of the final rule. These studies do not reflect the costs and benefits of the final CPP.

26. The requirements of the Clean Power Plan are not only feasible, they are also consistent with New Jersey state law. New Jersey's Global Warming Response Act mandates that New Jersey's greenhouse gas emissions must not exceed 1990 levels by 2020; by 2050, those emissions must be 80% lower than 2006 levels.[15] Implementation of the CPP will advance these currently binding state statutory targets.

BPU Oversight of Rates, Investments, and Reliability

27. Based on my experience with RGGI and as Commissioner of the BPU during a time when EPA promulgated several major Clean Air Act regulations affecting power plants in New Jersey, the Clean Power Plan would not substantially

[15] *See* N.J. Stat. § 26:2C-39, -40.

change the BPU's traditional role of overseeing utility investments, reliability, and electric rates.

28. Neither would New Jersey's participation in PJM create "uncertainty and jurisdictional conflicts between the states' authority and that of FERC," as declarants for the State of New Jersey suggest. Mroz Decl. ¶ 7a. New Jersey power companies have for many years participated in a competitive wholesale market operated by PJM Interconnection and regulated by the Federal Energy Regulatory Commission ("FERC"). Under RGGI and similar emissions trading programs for non-greenhouse gas pollutants, owners of EGUs incorporate the costs of obtaining emission allowances into the bids that are used to set the energy market clearing price and determine the dispatch order in the PJM real-time and day-ahead energy markets.[16] This is the mechanism New Jersey EGUs used when they were subject to RGGI, and that they currently use under the other Clean Air Act emissions trading programs described above. This

[16] Integration of emissions allowances into wholesale market prices occurs via two well-established pathways. Under most circumstances, energy prices in PJM are determined through market forces. When this is the case, the bids that generators offer into the competitive market implicitly reflect environmental compliance costs. However, in situations where certain generators are believed to exercise market power, PJM uses "cost-based" offers from generators to determine the wholesale price. PJM requires generators to include the cost of emission allowances, like other EGU costs, when determining these "cost-based" offers. See PJM, *A Review of Generation Compensation and Cost Elements in the PJM Markets* 11 (2009), *available at* http://www.pjm.com/~/media/committees-groups/committees/mrc/20100120/20100120-item-02-review-of-generation-costs-and-compensation.ashx.

mechanism has functioned smoothly for years while allowing PJM to ensure least-cost dispatch and protect reliability.

29. The BPU, which has no authority over the wholesale electricity markets, has no involvement in the development of any generator's bid. As a result, the BPU incurs no administrative burden in connection with bids submitted into the wholesale market. PJM could also integrate the cost of greenhouse gas allowances with minimal administrative burden, as it did when New Jersey participated in RGGI and as it continues to do for other RGGI states in PJM.

30. As noted above, the BPU does not determine environmental compliance strategies for New Jersey EGUs under this competitive market structure. Under RGGI and similar Clean Air Act programs, it is up to owners and operators of New Jersey EGUs to determine how best to comply with environmental requirements. In the case of RGGI, owners and operators could choose whether to upgrade their plants to reduce CO_2 emissions, shift generation to cleaner energy resources, purchase emissions allowances, or retire. No ratemaking proceeding under the BPU's authority was necessary.

31. New Jersey also has a robust, multilayered system to maintain electric reliability that will continue to serve the state's electricity consumers during the implementation of the Clean Power Plan. The BPU holds hearings and performs investigations pertaining to reliability and is authorized to require utilities to build new electric transmission infrastructure. In the recent past, the BPU has moved swiftly to reinforce the reliability of the New Jersey electric grid. During my tenure as Commissioner, the BPU increased the stringency of

its electric reliability standards in response to the Northeast blackout in 2003 and Hurricane Irene in 2011. Utilities now must meet rigorous requirements pertaining to planning, staffing, and other areas to maintain reliability, and are subject to penalties if they fail to do so.

32. There are also other entities that assist the BPU in maintaining the reliability of electric service. PJM, the regional transmission organization serving the entire State, assists with reliability by, among other things, monitoring the transmission system and by assuring compliance with the national reliability standards approved by FERC. In addition, PJM maintains a forward-looking capacity market that is designed to ensure sufficient generating capacity is available to meet demand several years in advance. These overlapping institutions and processes will continue to be available to protect reliability going forward as the Clean Power Plan is implemented.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 3rd day of December, 2015, in New Brunswick, New Jersey.

Jeanne M. Fox

Jeanne M. Fox

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency et al. Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF DIANE MUNNS

I, Diane Munns, hereby state and declare as follows:

1. I currently serve as the Senior Director for External Affairs and Regulatory Policy in the Clean Energy Program at the Environmental Defense Fund.[1] In that capacity I manage partner relationships with regulators, utilities and other energy and environmental organizations and guide regulatory activities in the organization.
2. I have extensive experience as a state energy and utilities regulator. I spent over two decades with the Iowa Utilities Board, including terms as Chair and General

[1] Environmental Defense Fund is one of the proposed respondent-intervenors in the current litigation.

Counsel. The Iowa Utilities Board is responsible for regulating gas, electric and telecommunication companies within the State of Iowa.

3. While Chair of the Iowa Utilities Board, I served two terms (from 2005-2006) as the President of the National Association of Regulatory Utility Commissioners (NARUC), the Washington D.C.-based member association for energy regulators. Immediately following my tenure at the Iowa Utilities Board, I worked for approximately two years as a senior manager at the Edison Electric Institute, the national trade association for investor-owned utilities.
4. Prior to my engagement at EDF, I worked for five years (from 2008-2014) at MidAmerican Energy Company as Vice President of Regulatory Relations and Energy Efficiency. MidAmerican Energy Company is an Iowa-based combination gas and electric company with nearly 750,000 customers in Iowa, Illinois, South Dakota, and Nebraska.
5. My experience as a state utilities regulator, with two national trade associations, and with a Midwestern power company has provided me with extensive expertise in regulatory and policy issues relating to the power sector, including resource forecasting and planning. In my two decades at the Iowa Utilities Board, I was engaged in numerous planning and siting dockets that led to the permitting of new infrastructure, including power plants, wind turbines, transmission lines and pipelines. I was also involved in setting policy to foster new renewable resources, leading to Iowa's remarkable rise and on-going success in wind energy production. As a regulator, I supported energy efficiency programs within the state. Through my work at the National Association of Regulatory Utility Commissioners and the

Edison Electric Institute, I broadened this state perspective to a national one as I regularly interacted with other state regulators and power company officials.

6. Finally, my tenure at MidAmerican provided experience with how regulatory and resource planning issues play out within the structure of a utility. My responsibilities at MidAmerican included communicating company infrastructure plans to regulators. I also managed the efficiency portfolio and was responsible for programs to achieve savings.
7. At the Environmental Defense Fund, I focus on the adoption of policies to accelerate clean energy resources in states around the country.
8. This declaration presents the results of an analysis of Clean Power Plan compliance scenarios for each of the 27 states that have moved for a stay ("movant states").[2] The findings of this analysis refute assertions by the parties moving for a stay that the emissions requirements in the Clean Power Plan are infeasible or unreasonably onerous, and will cause irreparable harm during the litigation period. A detailed description of the analysis and results is attached as an Exhibit to this declaration.

Summary of Findings

9. This analysis finds that the carbon pollution standards in the Clean Power Plan are reasonable and achievable for the movant states within the time period covered by the rule. The analysis demonstrates that as many as 21 of the movant states can

[2] M.J. Bradley and Associates, LLC., conducted the analysis using its proprietary Clean Power Plan Compliance Tool (CPP Tool) based on scenarios defined by Environmental Defense Fund (EDF). EDF further directed the policy specifications and assumptions used in the analysis.

fully achieve the Clean Power Plan emission targets through the first three-year compliance period (2022-2024) — and for as many as 18 states, all the way through 2030 — by relying exclusively on existing generation, investments already planned within each state, and implementation of respective existing state policies. These results are illustrated in Figure 1 below, which shows the furthest level of compliance for each state considering all scenarios and compliance options included in this analysis.

Figure 1. State Compliance with the Clean Power Plan (2022-2030)



10. Drawing on multiple widely-used public sources of industry-provided information, the analysis takes into account planned investments in new generation and already announced retirements that power companies are moving forward with independently of the Clean Power Plan. The analysis assumes that new generating

assets within a state are deployed so as to maximize the potential for emission reductions. It also considers existing policies in the movant states, such as renewable portfolio and energy efficiency resource standards, and assumes those policies continue to be implemented as currently planned. The resulting scenarios therefore represent "business-as-usual" or "planned" investments by industry, together with implementation of existing policies in the movant states, deployed in a manner that maximizes emission reductions.

11. Even when limiting the analysis to only those projects that are in the most advanced stages of development (i.e., plants that are already operating, under construction, undergoing site preparation or testing, or have been permitted), the analysis finds that 16 of the 27 states could still come into compliance through the first three-year compliance period based on these investments and existing state policies alone.

12. For the minority of states which this analysis found would not meet the Clean Power Plan emission reduction targets through planned investments alone, this analysis indicates that very modest efforts taken after the deadline for submitting state plans would be sufficient to close the gap. For example, it finds that all of the states could come into compliance in the first three-year compliance period merely by pursuing energy efficiency projects and new generation at a rate comparable to the average of their neighboring states beginning in 2019. Some states are projected to come into compliance simply by continuing to take the same steps in the coming years as they have in the recent past: North Dakota, for example, can

comply by continuing to build new wind generation after 2019 at a rate that mirrors its recent average rate of construction.

13. This analysis is conservative in several respects. First, the results presented above represent a world in which affected entities in the movant states do not take advantage of emission reduction opportunities outside their own state boundaries. In practice, the Clean Power Plan's flexible approach provides several options to leverage out-of-state emission reduction opportunities: through interstate emissions trading, or by establishing power purchase agreements for carbon free electricity in nearby states. The results presented above do not reflect these opportunities.

14. Our analysis does include a separate scenario that shows that if the 27 movant states were to allow regulated power plants to access emission reduction opportunities within any of the movant states – for example, through trading of allowances or credits across state lines – then all 27 movant states could come into compliance with the Clean Power Plan targets all the way through 2030 by leveraging existing generation, investments already planned within each state and implementation of respective existing state policies. However, even this scenario does not account for the additional flexibility to leverage opportunities in non-movant states, for example by emissions trading.

15. This analysis shows that with existing policies, existing generation, and planned new generation, movant states can achieve the emission reduction targets in the Clean Power Plan. The Clean Power Plan's targets are eminently reasonable and achievable.

16. The Clean Power Plan is crucial to ensuring that the nation fully harnesses opportunities to address harmful carbon pollution. In particular, the Rule's implementation can help establish market signals that incentivize deployment of new generation in a manner that maximizes emission reductions – as assumed in this analysis – and thereby help achieve the beneficial emissions outcomes envisioned here. Any delay or disruption in the implementation of the Clean Power Plan could put at risk these long-overdue and eminently achievable emission reductions.

Description of M.J. Bradley & Associates Compliance Tool

17. This declaration summarizes an analysis conducted by M.J. Bradley & Associates ("M.J. Bradley") of each movant state's compliance status, under a variety of compliance scenarios defined by EDF and based on assumptions and policy specifications provided by EDF, using M.J. Bradley's Clean Power Plan Compliance Tool (the "tool"). This tool is publicly accessible and allows any user to estimate the impact of different compliance strategies on a state's Clean Power Plan compliance status. The tool is available as a free public download from the M.J. Bradley website at www.mjbradley.com/about-us/case-studies/clean-power-plan-evaluation-tools.

18. According to M.J. Bradley, as of November 17, 2015, over 500 unique users have registered for access to the Clean Power Plan Compliance Tool. Users of the tool include policymakers from a majority of U.S. states and multiple federal agencies; utilities; independent power producers; grid operators; electric industry stakeholders; and non-governmental organizations.

19. The tool incorporates policy options outlined in the final rule, and provides the ability to alter all major drivers of state electric sector emissions and estimate the impact on the state's Clean Power Plan compliance status. Using the tool, policymakers can evaluate how planned actions, rules, and laws already on the books would affect a state's compliance status. Users have the ability to examine the impact of new generation resources as well as the way in which resources are deployed or run. The tool can, among other things, show how those changes impact emissions and emission rates of the electricity system in comparison to the Clean Power Plan targets.

20. Thus, the tool has the ability to show the impact on compliance of –

- Complying with existing energy efficiency resource standard and renewable portfolio standard programs
- Putting new generating resources into service
- Retiring fossil resources
- Modifying electricity demand growth rates

The tool is highly flexible and includes detailed data for the power sector, with unit level control of all fossil and nuclear generating units. It is also extremely transparent, in that any member of the public can access the tool and utilize the user-friendly documentation that M.J. Bradley has provided to build compliance scenarios.

21. The tool should not be confused with an economic model that dispatches generation based on assumptions about relative generation costs, such as the Integrated Planning Model (IPM) used by EPA, power companies, state regulators,

and others. IPM captures the economically driven electricity sector dispatch of resources, based on least-cost optimization for the system. The tool used here instead relies on user inputs – in this case industry assessments of likely new builds and assumptions about how those units will run. In these ways, IPM is a fundamentally different type of analytic platform from the tool used here, and their results, while complementary, should not be considered comparable. Each provides a distinct approach to understanding compliance options within the context of the Clean Power Plan.

22. The M.J. Bradley tool was chosen for this particular analysis because it is highly user-friendly, flexible, and can rapidly evaluate multiple scenarios. This analysis is not intended to project what the future of the electricity grid would look like in the absence of the Clean Power Plan, nor is it intended to illustrate the most likely or cost-effective compliance outcomes under the Rule.[3] This tool is appropriate for evaluating options that movant states could use to meet the standards through the combination of state policies and investments taken within their own borders, assuming that generating assets are operated in such a way as to maximize the potential for emission reductions.

[3] In addition, the M.J. Bradley & Associates tool does not directly account for transmission needs. However, this analysis minimizes such demands by constraining any additional generation to existing plants, planned or proposed new builds, and new renewables required by law which accordingly will have transmission associated with them.

Methodology

23. This analysis explores how compliance with the Clean Power Plan would be impacted by: 1) deploying planned new generating facilities such that emission reductions are maximized; 2) meeting renewable and efficiency requirements already required by state law or regulation, and similarly assuming that those clean resources are deployed to displace high-emitting generation;[4] and 3) factoring in announced retirements.

24. The analysis examines three discrete planned investment scenarios that each rely on different industry-produced information on new builds already in the development pipeline. The first scenario relies on information from integrated resource plans available within the respective state. The other two scenarios explore options for deploying "advanced development" and "early development" projects by relying on data included in the Velocity Suite, a widely-used industry database of announced new generation. Both sources — integrated resource plans and the Velocity Suite — are described in greater detail below.

25. Each state's compliance status was evaluated under three of the compliance options specified by EPA in the final rule: (1) a "dual rate" option in which steam electric generating units and natural gas combined cycle plants are each subject to the respective national performance rates set forth in the Clean Power Plan; (2) a

[4] Many utilities invest in consumer-side efficiency improvements even when they are not required to do so by law. They do this for a variety of reasons, including encouragement from their state commission as well as customer demand. In states without efficiency requirements, we assume that these modest investments – which are well below the level of investments made under mandatory energy efficiency programs – continue at current levels.

"blended rate" option in which all regulated power plants are subject to a single rate-based standard, also set forth in the Clean Power Plan; and (3) mass-based compliance for affected existing generating units plus new emitting sources based on emission budgets set forth in the Clean Power Plan.

26. For each state, compliance status was evaluated with respect to the interim compliance periods of 2022-2024, 2025-2027, 2028-2029, as well as the final target in 2030, following the timelines established in the final rule.[5] Where states were found to over-comply in the early years of the program, surplus allowances or credits were banked for use in later years, as the final rule allows.

27. The analysis conservatively assumed that each of the movant states would rely exclusively on activities required by the respective state policies and through investments already planned and documented within each state. However, the analysis separately considered a "combined" scenario that explores the potential for regulated entities in each of the movant states to access emission reduction opportunities in other movant states. Under the Clean Power Plan, this could occur via the interstate trading of credits or allowances, or by the establishment of power purchase agreements for carbon free electricity in nearby states. EPA has facilitated such opportunities by finalizing a trading-ready framework within the Rule that allows states to take advantage of these opportunities with other states

[5] The tool applied the default interim "step" requirements provided in the Clean Power Plan. In practice, states can take advantage of the flexibility to craft an individualized "glide path" that adjusts emission reductions over the interim period as needed to accommodate state-specific circumstances. This could mean that states select a less stringent emission reduction requirement earlier in the compliance period, and make up the difference at a later point in the compliance period.

that have similar program designs, without having to submit multi-state plans. Further, even the "combined" scenario we examine is still conservative since it does not account for the additional flexibility states have to leverage opportunities with states outside the group of movant states. Additional conservative aspects of this analysis are discussed in the "Additional Observations, Considerations and Conclusion" section below.

28. For all scenarios examined, the analysis assumes that any reductions in generation that result from announced retirements are first met by energy efficiency and zero-emitting generation, then by existing natural gas generation, and then by new natural gas resources coming online. In the case of some states, output from new natural gas resources reduces higher emitting generation further. The analysis is designed to minimize shifts in each state's balance of electricity imports and exports to the extent possible.

29. A more detailed discussion of the methods is included in the attached report.

Description of Planned Investment Scenarios

30. **Integrated Resource Plans.** This scenario examined in this analysis draws from available integrated resource plans submitted by vertically integrated utilities in the movant states.[6] Integrated resource plans are routinely developed by utilities, usually at the direction of state public utility commissions, to evaluate options for

[6] Texas and New Jersey are the only states examined in this analysis that are fully deregulated and thus have no vertically integrated utilities or integrated resource planning process.

meeting forecasted energy demand over a specified time period and for ensuring that reliability, air quality, and other policy requirements are met while considering affordability and cost effectiveness. These plans typically cover a planning horizon of 10 to 20 years, and are often updated every two to three years. More than 40 state utility commissions require integrated resource plans or similar analyses and use them to develop long range plans for the electric system. The development of these plans frequently involves a public stakeholder engagement process as well as the oversight and approval of the state public utility commission.

31. Because of their long-term nature, integrated resource plans do not represent an unalterable projection of what will happen in the future. However, integrated resource plans generally represent the result of a serious, rigorous exercise by the utilities and the state public utility commission to determine what resources would be reasonable to build – and retire – over the planning period. For this reason, examining the resource expansion and retirements considered as part of these plans can provide useful insight into future investments in the system.

32. This scenario likely understates opportunities to reduce carbon pollution using existing and planned infrastructure in some of the movant states because it relies solely on integrated resource plans from large vertically integrated utilities. Investment plans by entities that are not subject to integrated resource planning requirements, such as independent power producers, municipal power companies and electric cooperatives, are frequently not captured in integrated resource plans and thus would not be captured by this approach. Integrated resource plan

information was included in the analysis only where a recent integrated resource plan existed and where there was sufficient data for use in the tool.

33. This scenario was not applied for New Jersey or Texas, where their deregulated electricity markets do not require submission of integrated resource plans, or to Kansas, Mississippi, or West Virginia as M.J. Bradley & Associates were not able to identify any integrated resource plans for review during their screen.

34. **Advanced Development and Early Development in Velocity Suite:** The analysis also surveyed new power generating projects contained in the Velocity Suite database, which is maintained by ABB Energy Market Intelligence. The Velocity Suite is a top-tier industry data set available to anyone who subscribes to ABB Energy Market Intelligence. According to ABB, most major participants in the U.S. electric power sector, including 19 of the top 20 power generators and all seven Regional Transmission Organizations and Independent System Operators, use their information service as inputs into decision making.

35. Analysis using the Velocity Suite provides a useful complement to our separate scenarios using integrated resource plans. The Velocity Suite provides information on actions underway in all states, including those with restructured electric markets where power companies are not vertically integrated and there is no integrated resource plan information to apply within the tool (such as Texas and New Jersey). In addition, the Velocity Suite contains information on projects undertaken by entities such as independent power producers, municipal power companies and electric cooperatives that may not be required to file integrated resource plans.

36. Two separate scenarios were developed based on data in the Velocity Suite. The "advanced development" scenario included only projects that are in an advanced stage of development, including projects that the Velocity Suite classifies as operating, operating under test conditions, under construction, undergoing site preparation, or have received needed regulatory permits. A more expansive "early development" scenario took into account all "advanced development" projects, but also included additional projects that have either been publicly proposed by a power company or have permit applications pending with regulatory agencies.

37. Notably, new builds under the "early development" scenario are more than 20 percent lower than new builds observed over a comparable historical period (i.e., the last 18 years as the scenarios considered here reflected new builds from 2013-2030), indicating that even this scenario reflects a conservative estimate of new investments. New builds from 2013-2030 under the "advanced development" scenario are only approximately one-third the amount of new builds seen over the last 18 years.[7]

All Movant States Have Eminently Feasible Options for Compliance

38. All three planned investment scenarios envision the continued expansion of low carbon generation that has been occurring over the last two decades. Both the scenario based on integrated resource plan data, and the two scenarios derived from the Velocity Suite, indicate that power companies have already proposed or

[7] See Exhibit, at 18.

are developing significant expansions of wind, solar, and natural gas generating capacity.

39. If one conservatively assumes that each of the movant states leverage only existing and planned investments within each state, the analysis concludes that as many as 21 of the 27 states could comply with the Clean Power Plan through the first three-year compliance period (2022-2024), and as many as 18 of the 27 states could comply through 2030. Even when limiting the analysis to only those projects in the most advanced stages of development (the "advanced development" scenario based on Velocity Suite), 16 of the 27 states could come into compliance through the first three-year compliance period.

40. The analysis further finds that the remaining states can come into compliance through a very modest compliance effort, merely by pursuing energy efficiency projects and new generation at a rate comparable to the average of their neighboring states beginning in 2019, after state plans are due.

41. A detailed description of the results of each scenario appears below:

- Velocity Database "Advanced Development" Scenario: When considering only the new builds in the most advanced stages of development as well as renewable energy and energy efficiency investments required by state law, the analysis found that 16 of the 27 states could come into compliance through the first compliance period (2022-2024), and 14 of the 27 states could come into compliance all the way through 2030. Thus, a majority of movant states achieve compliance in early years or throughout the Clean Power Plan compliance period relying only on implementation of current

state policies (e.g., renewable and efficiency standards) and new generation that is already operating, under construction, or permitted in the state. No additional incremental action is necessary for these states to achieve compliance. Of the 11 states that are not in compliance at the start of the program, 9 were found to be able to come into compliance in the 2022-2024 period merely by pursuing new generation projects at the same rate as the average of their neighboring states. The only state that could not come 90 percent or more of the way into compliance – North Dakota – could come into compliance if it instead simply continued to take the same steps in the coming years as it has in the recent past.[8]

- Integrated Resource Plan Scenario: This analysis considered the impact of planned projects that were identified by power companies through the integrated resource planning process. This analysis was not possible for New Jersey and Texas because these states do not apply an integrated resource plan process. In addition, M.J. Bradley & Associates were not able to identify any integrated resource plans for Kansas, Mississippi, or West Virginia. The analysis found that 14 of the 22 states considered were in compliance through the first compliance period (2022-2024), and 11 of the 22 states were in compliance through 2030.

[8] Specifically we examined what would happen if the state continued to build new wind turbines beginning in 2019 at the same rate it averaged new wind generation from 2010 through 2015.

- Velocity Database "Early Development" Scenario: This scenario considered the full range of projects under development in the Velocity database as well as renewable and energy efficiency investments required to comply with state law. This included projects identified as being in stages of "advanced development" as well as those that had permit applications pending and were proposed. This scenario found that 20 of the 27 states were in compliance through the first compliance period (2022-2024), and 18 of the 27 states were in compliance through 2030. However, the analysis found that all states could come into compliance in the first compliance period (2022-2024) if they matched their neighbors' average recent historical investments in energy efficiency and generation in the years that followed the deadline for submitting state plans.

42. As noted, the results discussed in ¶¶ 33-35 are based on the extremely conservative assumption that sources within each of the movant states do not take advantage of emission reduction opportunities in other states. Under all three of the planned investment scenarios examined, the analysis found that all 27 movant states could collectively achieve compliance in the first compliance period without incremental action if they leveraged cross-border emission reduction opportunities through mechanisms such as interstate trading. When considering the early deployment scenario, the analysis found that the 27 movant states could collectively achieve compliance through 2030. Notably, even this scenario does not account for the

additional flexibility states have to leverage opportunities with states outside the group of movant states.

Additional Observations, Considerations and Conclusion:

43. This analysis finds that planned investments and existing state policies already put the majority of movant states in position to fully comply with the Clean Power Plan emission targets in the initial years of the compliance period — and in many cases, all the way through 2030. It also finds that for the states that need to take additional incremental action, compliance can be achieved with the initial year targets by taking only modest actions in line with recent trends in each respective state or neighboring states in the years that follow the deadline for submitting state plans.

44. As stated above, our analysis comes to these results by relying exclusively on activities required by the respective state policies and through investments already planned within each state. Thus, it represents an extremely conservative approach to examining compliance, since in practice, states have significant flexibility to leverage emission reduction opportunities with other states. This could occur in the form of trading of allowances or credits or by regional optimization of deployment of generation resources. The Clean Power Plan encourages and facilitates such regional or multi-state approaches to compliance, including by providing "model rules" that allow sources in different states to trade credits or allowances without a formal interstate agreement or arrangement.

45. Not only is this sort of multi-state approach to compliance the norm for air pollution programs – such as the Cross State Air Pollution Rule, the Clean Air Interstate Rule, and the NO_x SIP Call – but it is the norm for the energy system as well. Energy markets continue to become more and more regionalized as states recognize the value of leveraging the flexibility and cost savings that come with wider coordination. There is no reason to believe that these trends will suddenly reverse course as states move to implement the Clean Power Plan.

46. Moreover, our analysis of the movant states' compliance status during the first interim compliance period (2022-2024) does not take into account the flexibility that each state has under the Clean Power Plan to postpone emission reductions to later compliance periods as part of its state plan. This is an important compliance flexibility, and it is reasonable to expect that states will utilize it to determine an optimal "glide path" for achieving the interim and final emission reduction requirements of the Clean Power Plan.

47. States are already harnessing cost effective tools to reduce their carbon emissions, and this analysis shows that these efforts already put them in position to achieve Clean Power Plan targets. Evidence suggests that these cost-effective opportunities will only continue to expand in the years ahead, further underscoring the conservative nature of this analysis. The price of low and zero-carbon generating resources continues to fall – with solar prices falling 80 percent since 2007 alone – and sustained advances in wind technology continue to open up economic

opportunities across the United States.[9, 10] Meanwhile, recent improvements in grid voltage optimization technologies (Volt/VAr) are providing opportunities to reduce electricity lost during transmission to "line losses" while driving direct bill reductions. In addition, demand-side energy efficiency investments continue to increase, and are expected to double by 2025,[11] simultaneously driving emissions reductions and bill savings. None of these emerging opportunities and trends are reflected in this analysis. The tremendous potential of these opportunities further underscores that the targets laid out in the Clean Power Plan are eminently achievable and reasonable.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on December 7, 2015.



Diane Munns

[9] Bloomberg New Energy Finance and Business Council for Sustainable Energy, "Sustainable Energy in America: 2015 Factbook," February 2015, accessed August 5, 2015, http://www.bcse.org/wp-content/uploads/2015-Sustainable-Energy-in-America-Factbook.pdf

[10] U.S. Department of Energy, "Enabling Wind Power Nationwide," May 2015, accessed August 5, 2015, http://energy.gov/sites/prod/files/2015/05/f22/Enabling%20Wind%20Power%20Nationwide_18MAY2015_FINAL.pdf

[11] Galen L. Barbose et. al., The Future of Utility Customer-Funded Energy Efficiency Programs in the United States: Projected Spending and Savings to 2025 at 5 (Lawrence Berkeley National Laboratory, Jan. 2013).

State Scenarios

EPA's Clean Power Plan: Compliance Pathways

DECEMBER 7, 2015

Important: The findings presented in this report were generated by M.J. Bradley and Associates, LLC., using its proprietary Clean Power Plan Compliance Tool (CPP Tool) based on scenarios defined by Environmental Defense Fund (EDF). EDF further directed all policy specifications and assumptions used in this analysis.

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SUMMMARY OF FINDINGS

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Findings (1 of 3)

- This analysis indicates that the carbon dioxide emission reduction targets laid out in the Clean Power Plan can be achieved by the movant states within the time periods covered by the Rule. For each of the movant states, the analysis takes into account planned investments in new generation and already announced retirements that power companies have been planning independently of the Clean Power Plan.
- This analysis uses several public sources of industry-provided information. It also considers existing policies in the movant states, such as renewable portfolio and energy efficiency resource standards, and assumes those policies continue to be implemented as currently planned.
- The resulting scenarios therefore represent “business-as-usual” or “planned” investments by industry combined with implementation of existing policies in the movant states, deployed in a manner that maximizes emission reductions.
- The analysis finds that the majority of the movant states can fully comply with the Clean Power Plan emission targets in the initial years of the compliance period — and in many cases, all the way through 2030 – by relying exclusively on existing generation, investments already planned within each state and implementation of respective existing state policies.

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Findings (2 of 3)

- The analysis concludes that existing and planned investments could bring as many as 21 of the 27 states into compliance through the first three-year compliance period (2022-2024), and as many as 18 of the 27 states into compliance all the way through 2030.

- When limiting the analysis to only those projects that are in the most advanced stages of development (i.e., plants that are already operating, under construction, undergoing site preparation or testing, and those that have been permitted), the analysis finds that 16 of the 27 states could still come into compliance through the first three-year compliance period based on these investments and existing state policies alone.

- The analysis further finds that all of the states could come into compliance in the first three-year compliance period by pursuing energy efficiency projects and new generation at a rate comparable to the average of their neighboring states beginning in 2019.

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Findings (3 of 3)

- The previous results represent a world in which affected entities in the movant states do not take advantage of emission reduction opportunities outside their own state boundaries. In practice, the Clean Power Plan's flexible approach provides several options to leverage out-of-state emission reduction opportunities: through interstate emissions trading, or by establishing power purchase agreements for carbon free electricity in nearby states. The results presented above do not reflect these opportunities.
- The analysis does include a separate scenario that shows that if the 27 movant states were to allow regulated power plants to access emission reduction opportunities within any of the movant states – for example, through trading of allowances or credits – then all 27 movant states could come into compliance with the Clean Power Plan targets all the way through 2030 by leveraging existing generation, investments already planned within each state and implementation of respective existing state policies.
- However, even this scenario does not account for the additional flexibility to leverage opportunities in non-movant states, for example, by emissions trading.
- This analysis depicts the emissions reductions that would occur if generating resources were deployed in a manner that maximizes their emissions benefits. It is not meant to represent how generation resources would be run in the absence of the Clean Power Plan: the signals provided by the Rule could encourage this new generation to be deployed in a way that achieves the most beneficial emissions outcomes.

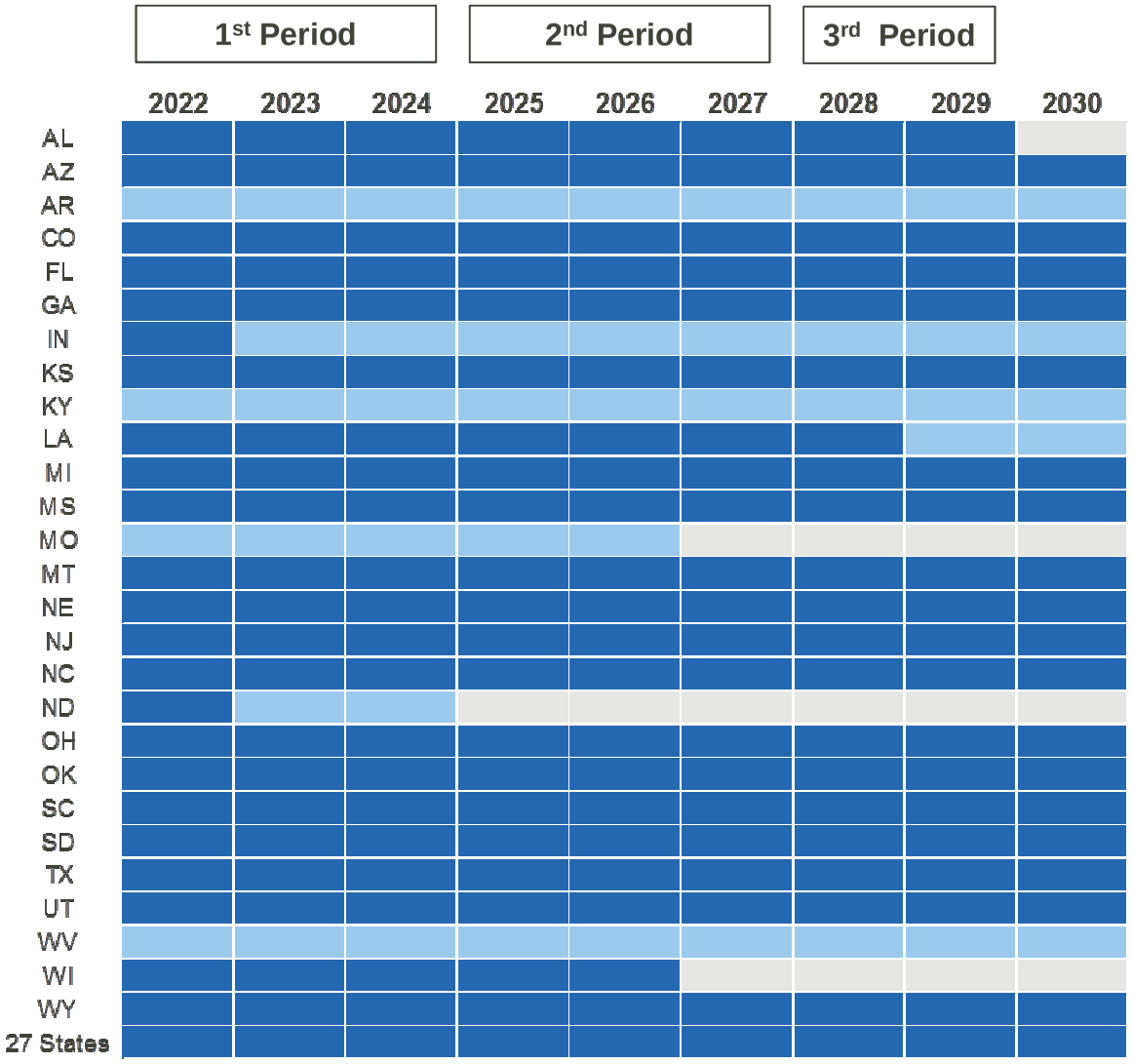
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State Compliance with the Clean Power Plan (2022-2030)

As shown here, existing and planned investments could allow the vast majority of the 27 movant states to come into compliance with the Clean Power in the initial years of the compliance period (21 states) — and in many cases, all the way through 2030 (18 states).

When the 27 movant states are allowed to allowed to access emission reductions within any of the movant states, all 27 are able to comply through 2030.



Indicates Compliance Under:

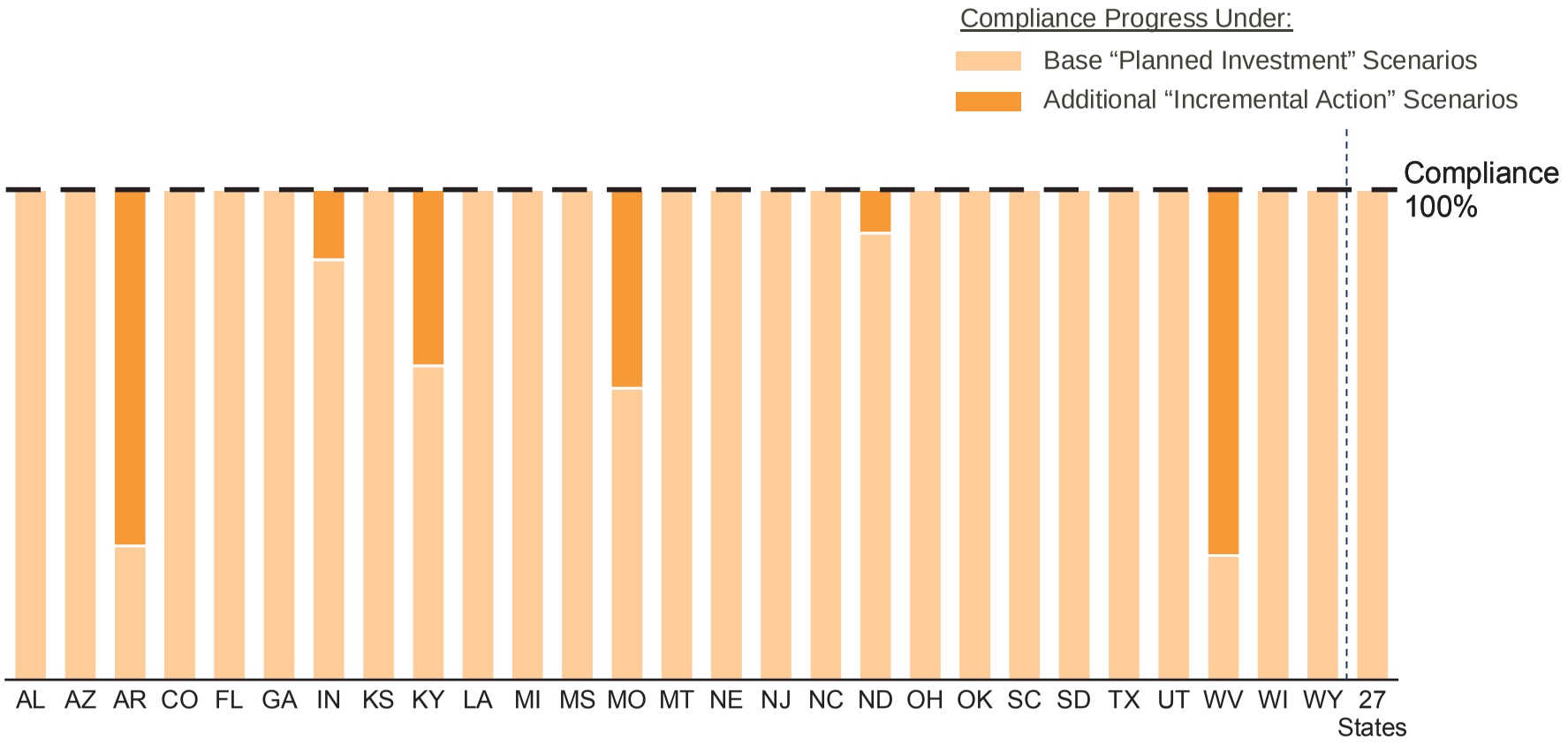
- Base "Planned Investment" Scenarios
- Additional "Incremental Action" Scenarios

** These results show the furthest level of compliance for each state considering all scenarios and compliance options included in this analysis.*

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State Progress in the First Compliance Period (2022-2024)

States that do not meet their emission reduction targets under the planned investment scenarios could close the gap and come into compliance by deploying new investments at a rate comparable to their average neighbor.



** These results show the furthest level of compliance for each state considering all scenarios and compliance options included in this analysis.*

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OVERVIEW OF STUDY

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Overview

- This analysis explores how compliance with the Clean Power Plan would be impacted by: 1) deploying planned new builds such that emission reductions are maximized; 2) meeting renewable and efficiency requirements already required by state law or regulation, and similarly assuming that those clean resources are deployed to displace high-emitting generation; and 3) factoring in announced retirements.
- The analysis examines three discrete planned investment scenarios that each rely on different industry-produced information on new builds already in the development pipeline. The first scenario relies on information from integrated resource plans found within the respective state. The other two scenarios explore options for deploying “advanced development” and “early development” projects by relying on data included in the Velocity Suite, a top-tier industry database of announced new generation. Both sources, integrated resource plans and the Velocity Suite, are described in greater detail in the pages that follow.

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Overview (continued)

- For each state, compliance status was evaluated with respect to the interim compliance periods of 2022-2024, 2025-2027, 2028-2029, as well as the final target in 2030, following the timelines established in the final rule. Where states were found to over-comply in the early years of the program, surplus allowances or credits were banked for use in later years, as the final rule allows.

- The analysis assumed that each of the movant states would rely exclusively on activities required by the respective state policies and through investments already planned and documented within each state.

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Overview (continued)

- The analysis separately considered a “combined” scenario that explores the potential for regulated entities in each of the movant states to access emission reduction opportunities in other movant states.

- Under the Clean Power Plan, this could occur via the interstate trading of credits or allowances, or by the establishment of power purchase agreements for carbon free electricity in nearby states. EPA has facilitated such opportunities by finalizing a trading-ready framework within the Rule that allows states to take advantage of these opportunities with other states that have similar program designs, without having to submit multi-state plans.

- The “combined” scenario does not account for the additional flexibility states have to leverage opportunities with states outside the group of movant states.

- For all scenarios examined, the analysis assumes that any reductions in generation that result from announced retirements are first met by energy efficiency and zero-emitting generation, then by existing natural gas generation, and then by new natural gas resources coming online. In the case of some states, output from new natural gas resources reduces higher emitting generation further. The analysis is designed to minimize shifts in each state’s balance of electricity imports and exports to the extent possible.

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SCENARIOS CONSIDERED

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Base “Planned Investment” Scenarios

The analysis examines the following three discrete planned investment scenarios that each rely on different industry-produced information on new builds already in the development pipeline.

1. **Deployment of all New Resources in Advanced Development** – This scenario considers electric generation projects that are far along in their development, and is limited to those that were recently built and now operating, as well as plants that are under construction, undergoing site preparation or testing, and those that have been permitted.

2. **Deployment of New Resources Based on Integrated Resource Plans** – This scenario draws from available Integrated Resource Plans (IRP) submitted by vertically integrated utilities in the movant states.

3. **Deployment of all New Resources in Early Development** – This scenario considers electric generation projects that are in advanced development as well as additional projects that have either been publicly proposed by a power company or have permit applications pending with regulatory agencies. While this data set is more expansive than the other two scenarios considered, it still contains 20 percent fewer new builds than have been observed over the most recent equivalent time horizon years.

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Scenario Based on IRP Submissions

- This scenario draws from integrated resource plans submitted by vertically integrated utilities in the movant states. Integrated resource plans are routinely developed by utilities, usually at the direction of state public utility commissions, to evaluate options for meeting forecasted energy demand over a specified time period and for ensuring that reliability, air quality, and other policy requirements are met while considering affordability and cost effectiveness. These plans typically cover a planning horizon of 10 to 20 years, and are often updated every two to three years.
- More than 40 state utility commissions require integrated resource plans or similar analyses and use them to develop long range plans for the electric system. The development of these plans frequently involves a public stakeholder engagement process as well as the oversight and approval of the state public utility commission.
- Because of their long-term nature, integrated resource plans do not represent an unalterable projection of what will happen in the future. However, integrated resource plans generally represent the result of a serious, rigorous exercise by the utilities and the state public utility commission to determine what resources would be reasonable to build – and retire – over the planning period. While important factors affecting the electricity system may change such that plans are adjusted over time, deviation from an existing integrated resource plan often requires justification by the utilities. For this reason, examining the resource expansion and retirements considered as part of these plans can provide insight into future investments in the system.

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Scenario Based on IRP Submissions (continued)

- This scenario relies solely on integrated resource plans from large vertically integrated utilities. Investment plans by entities that are not subject to integrated resource planning requirements, such as independent power producers, municipal power companies and electric cooperatives, are frequently not captured in integrated resource plans and thus would not be captured by this approach.

- Integrated resource plan information was included in the analysis only where a recent integrated resource plan existed and where there was sufficient data for use in the tool.

- Thus, this scenario was not applied for New Jersey or Texas, where their deregulated electricity markets do not require submission of integrated resource plans, or to Kansas, Mississippi, or West Virginia as we were not able to identify any integrated resource plans for review during their screen.

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Advanced and Early Development Scenarios Based on the Velocity Suite

- For the “Advanced Development” and “Early Development” scenarios, the analysis relied on new power generating project information contained in the Velocity Suite database, which is maintained by ABB Energy Market Intelligence.

- The Velocity Suite is a top-tier industry data set available to anyone who subscribes to ABB Energy Market Intelligence. According to ABB, most major participants in the U.S. electric power sector, including 19 of the top 20 power generators and all seven Regional Transmission Organizations and Independent System Operators, use their information service as inputs into decision making. The New Entrants database is updated on a daily basis, leveraging FERC filings, National and State Regulatory websites, State and County Planning and Zoning Departments, among other sources.

- The Velocity Suite provides information on actions underway in all states including those with restructured electric markets where power companies are not vertically integrated and there is no IRP information to apply within the tool (such as Texas and New Jersey). In addition, the Velocity Suite contains information on projects undertaken by entities such as independent power producers, municipal power companies and electric cooperatives that may not be required to file IRPs.

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Advanced and Early Development Scenarios Based on the Velocity Suite (continued)

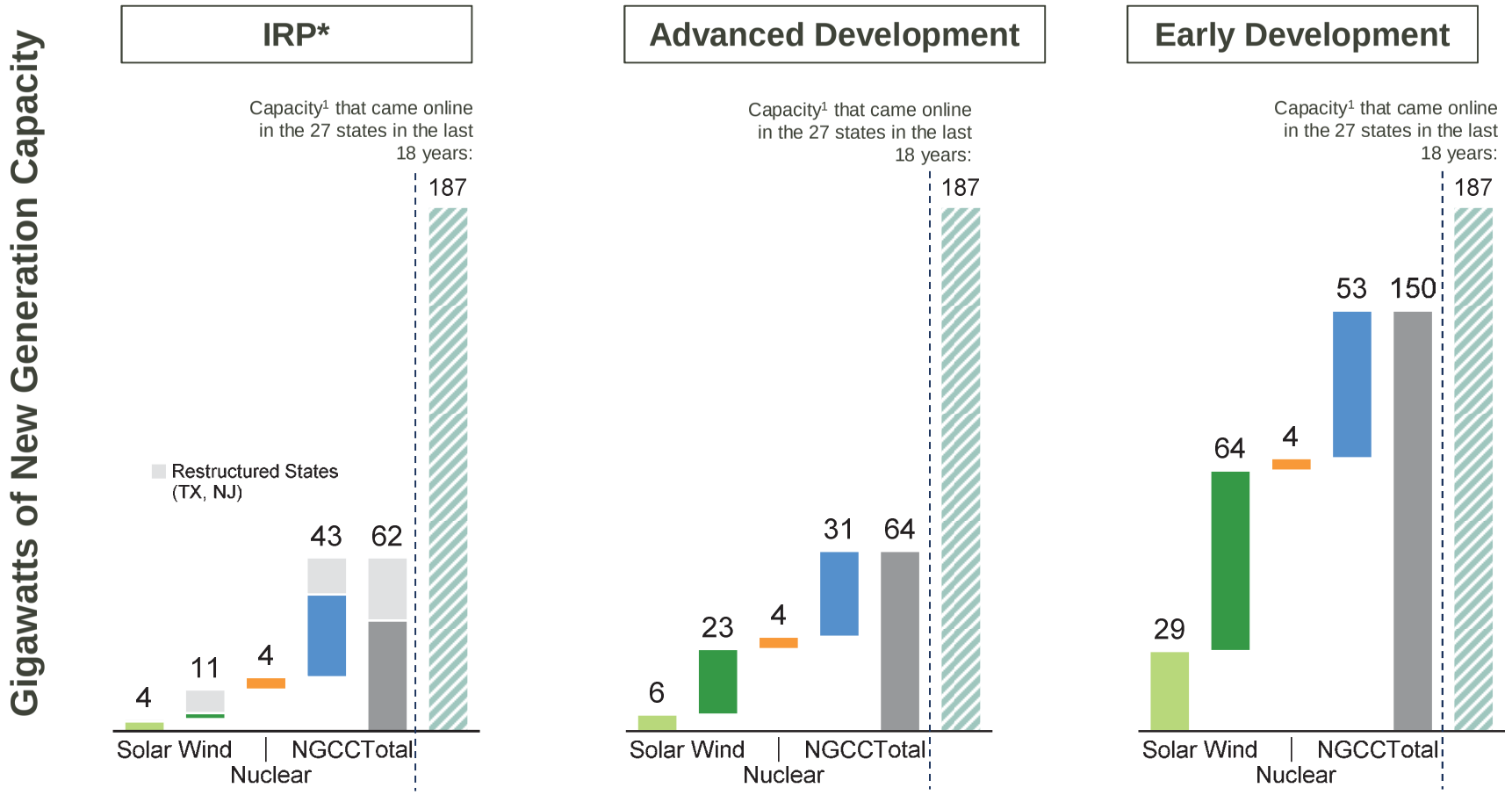
Advanced Development	Operating	Generator is available to operate
	Testing	Generator is operating under test conditions, but not yet in commercial service
	Under Construction	Planned generator is under construction
	Site Prep	The power plant site is being prepared for construction
	Permitted	The approval of one or more mandated federal, state, and/or regional regulatory permits for the given power generating facility or unit
Early Development	Includes all projects in “Advanced Development” plus:	
	Application Pending	Regulatory approval pending for one or more applications filed for permits
	Proposed	New generator planned for installation

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New Builds From 2013 through 2030

(27 state total)

The following figure shows new generation relative to the 2012 base year, as defined under the Clean Power Plan. Note that even in the early development scenario, which considers all projects in early development, that new builds over the period considered are still roughly 20 percent lower than the amount of new build capacity over the most recent historical period of comparable length.



** The light gray bars in the IRP scenario represent new generation in advanced development in the restructured states that do not have IRPs (i.e. TX and NJ). This was included for illustrative purposes only on this slide in order to enable a more direct comparison across scenarios, but was not included in the IRP scenario analysis.*

[1]Includes solar, wind, nuclear, and NGCC

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Additional "Incremental Action" Scenario

This scenario examines what would happen if a state took incremental action equivalent to their average neighbor. Specifically, it assumed:

1. The state constructed new generation based on their neighbors' average historical new construction of wind, solar, and natural gas combined cycle units over the period 2010 to 2015. States with significantly high levels of historic new build development were excluded from the calculation of the averages. For example, Texas was not considered in the calculation of average new build rate of neighbors for application

2. The state pursued energy efficiency opportunities at a level equivalent to the average of their neighbors, taking into account the states' energy efficiency standards, and historical investments in states that do not have energy efficiency standards.

We assumed that no additional investments occurred until after the deadline for submitting state plans under the Clean Power Plan. Thus, incremental action did not commence until 2019.

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ANALYTIC FRAMEWORK

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Overview of M.J. Bradley Clean Power Plan Compliance Tool

- The M.J. Bradley & Associates ("M.J. Bradley") Compliance Tool (the "tool") is designed to allow users to analyze state and multi-state region progress towards compliance with the Clean Power Plan under a range of electricity demand and generation scenarios.
- The tool incorporates policy options outlined in the final rule, and provides the ability to alter all major drivers of state electric sector emissions and estimate the impact on the state's Clean Power Plan compliance status. Using the tool, policymakers can evaluate how planned actions, rules, and laws already on the books would affect a state's compliance status. Users have the ability to examine the impact of new generation resources as well as the way in which resources are deployed or run. The tool can, among other things, show how those changes impact emissions and emission rates of the electricity system in comparison to the Clean Power Plan targets.
- Thus, the tool has the ability to show the impact on compliance of –
  - Complying with existing energy efficiency resource standard and renewable portfolio standard programs
  - Putting new generating resources into service
  - Retiring fossil resources
  - Modifying electricity demand growth rates
- The tool is highly flexible and includes detailed data for the power sector, with unit level control of all fossil and nuclear generating units. It is also extremely transparent, in that any member of the public can access the tool and utilize the documentation that M.J. Bradley has provided to build compliance scenarios.

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Who is Using the M.J. Bradley Clean Power Plan Compliance Tool?

- As of November 2015, **over 500 unique users** had registered for access to the Clean Power Plan Compliance Tool
- Users include policymakers from a majority of U.S. states and multiple federal agencies, utilities, independent power producers, grid operators, electric industry stakeholders and non-governmental organizations
- Utilities, their industry associations, and state/federal regulatory agencies together make up the majority of all users of the Compliance Tool
- M.J. Bradley Clean Power Plan Tools have been in development since 2014; several updates and improvements have occurred since EPA released the final Clean Power Plan Rule in August 2015
- The tool is publicly available and can be downloaded from the website at: http://www.mjbradley.com/about-us/case-studies/clean-power-plan-evaluation-tools

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Why is the M.J. Bradley Clean Power Plan Compliance Tool well-suited for this analysis?

- The tool was chosen for this particular analysis because it is flexible and can rapidly evaluate multiple scenarios. This analysis is not intended to project what the future of the electricity grid would look like in the absence of the Clean Power Plan, nor is it intended to illustrate the most likely or cost-effective compliance outcomes under the Rule. However, it is appropriate for evaluating options that movant states could use to meet the standards through the combination of state policies and investments taken within their own borders, assuming that generating assets are operated in such a way as to maximize the potential for emission reductions.
- The tool should not be confused with an economic model that dispatches generation based on assumptions about relative generation costs, such as the Integrated Planning Model (IPM) used by EPA, power companies, state regulators, and others. IPM captures the economically driven electricity sector dispatch of resources, based on least-cost optimization for the system. The tool used here instead relies on user inputs – in this case industry assessments of likely new builds and assumptions about how those units will run. In these ways, IPM is a fundamentally different type of analytic platform from the tool used here, and their results, while complementary, should not be considered comparable. Each provides a distinct approach to understanding compliance options within the context of the Clean Power Plan.
- In addition, the M.J. Bradley tool does not directly account for transmission needs. However, this analysis minimizes such demands by constraining any additional generation to existing plants, planned or proposed new builds, and new renewables required by law which accordingly will have transmission associated with them.

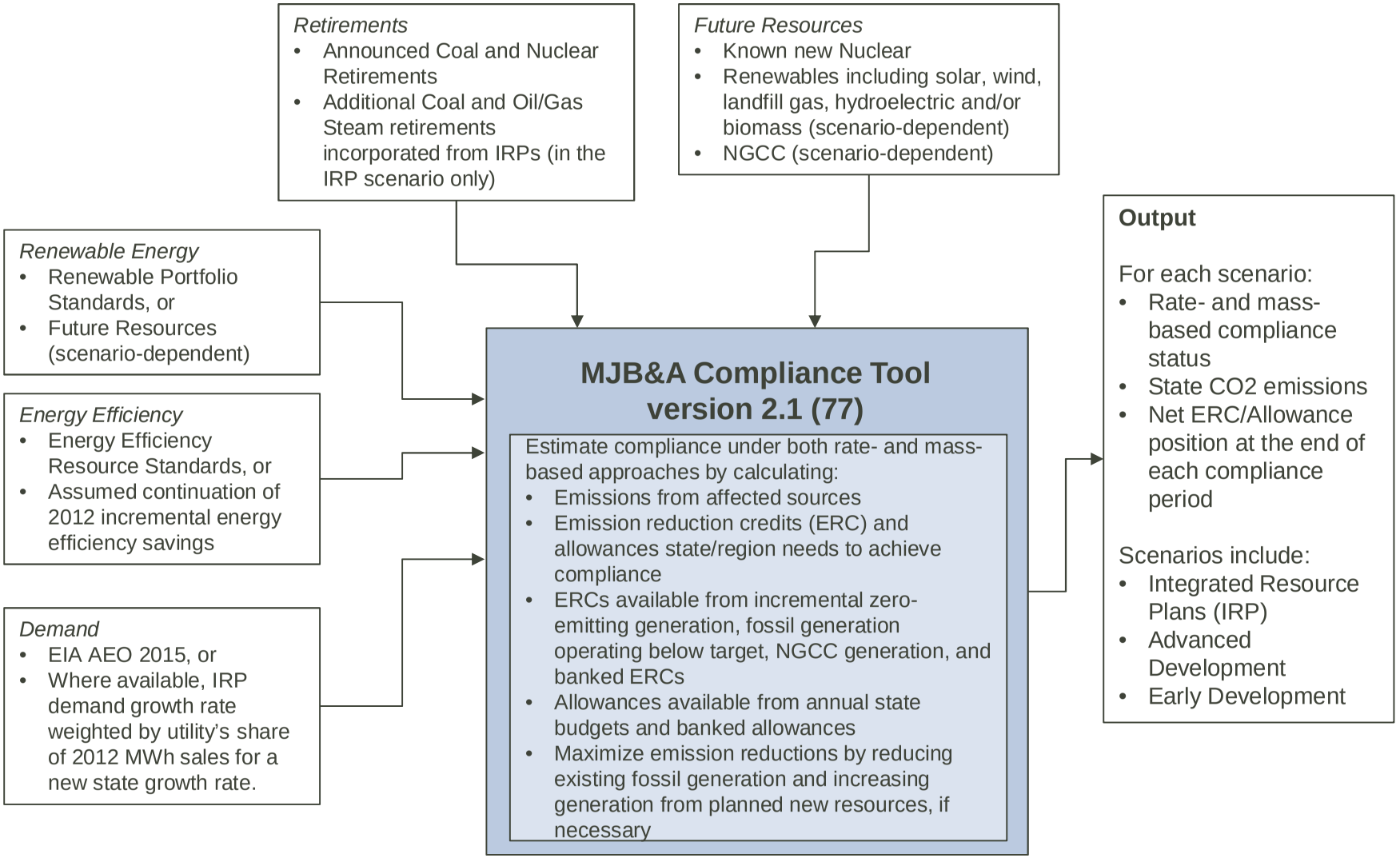
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METHODS & ASSUMPTIONS

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Scenario Modeling Framework



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Inputs to the M.J. Bradley Compliance Tool

Electricity Demand

- Electricity demand projections were based on the Energy Information Administration's Annual Energy Outlook 2015 (which was also used in EPA's analysis of the Clean Power Plan). When the data was available, these were supplemented by demand projections in utility Integrated Resource Plans (IRP) for consistency with the new build assumptions. Utility-specific projections in IRPs were converted into state-level projections after weighting them to account for each utility's' share of 2012 total in-state sales.

Energy Efficiency

- Where state energy efficiency resource standards existed, sufficient energy efficiency was deployed to meet the respective goals.
- Many utilities invest in consumer-side efficiency improvements even when they are not required to do so by law. They do this for a variety of reasons, including encouragement from their state commission as well as customer demand. Therefore, when states did not have energy efficiency resource standards, the analysis assumed that current levels of investment continue into the future. While the total savings from these voluntary investments is well below those investments made under mandatory programs, the analysis assumed that these investments remain fixed.
- When evaluating state compliance on a rate-basis, all eligible energy efficiency investments were fully credited in the form of Emission Reduction Credits (ERCs).

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Inputs to the M.J. Bradley Compliance Tool (continued)

Renewable Energy

- The scenarios examined new renewable generation projected as a result of state renewable standards, as well as new builds indicated in the respective scenario data. In order to prevent double counting, the higher build rate was used, and not both. For analytic purposes new builds were assumed to be used to help the state comply with its carbon pollution targets under the Clean Power Plan.

Future Resources

- In order to avoid double counting, the Compliance Tool's built-in database of known new resources was eliminated and replaced with new builds indicated in the respective scenario's data sources. Known future nuclear for Georgia and South Carolina were included in all scenarios. Maximum generation from new resources was defined based on standard capacity factors built into the Compliance Tool.

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Inputs to the M.J. Bradley Compliance Tool (continued)

Resource Retirements and Energy Balance

- All announced coal retirements tracked by M.J. Bradley & Associates were included. This list of retirements can be viewed in the downloadable tool.
- The IRP scenario also included any additional coal and oil/gas steam retirements (and/or natural gas repowers) indicated in IRPs.
- Known nuclear retirements for New Jersey and Wisconsin were included in all scenarios.
- Electric output lost to retired generation was first replaced with a mix of energy efficiency and zero-emitting generation, up to the amount specified by the inputs described previously. If the amount of this incremental generation exceeded the resource gap left by retiring fossil units, then it served to replace coal-fired generation. If instead, a resource gap remained, generation lost due to retirements was replaced by increasing natural gas-fired generation at existing units. The relevant resource gap was defined in a manner that attempts to hold the state's balance of imports and exports relatively constant from 2012 through 2030, such that into the future this balance is kept as closely in line as possible with recent historic trends.

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Inputs to the M.J. Bradley Compliance Tool (continued)

New Natural Gas Combined-Cycle Units

- For purposes of this analysis new natural gas-fired generation was limited to only those plants listed in the IRP or Velocity database, as appropriate for the particular scenario.

- Generation output from those new units was determined by first satisfying any lingering resource gap.

- Generation was further increased as necessary to help the state reduce emissions of carbon pollution in line with the requirements of the Clean Power Plan up to a maximum capacity factor of 75 percent. The analysis assumed that this generation would be used to offset the highest emitting generation in the state.

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Outputs

- Compliance status was evaluated under three of the compliance options specified by EPA in the final rule:
  - a “dual rate” option in which steam electric generating units and natural gas combined cycle plants are each subject to the respective national performance rates set forth in the Clean Power Plan;
  - a “blended rate” option in which all regulated power plants are subject to a single rate-based standard; and
  - mass-based compliance for affected existing generating units plus new emitting sources.
- For each state, compliance status was evaluated with respect to the interim compliance periods of 2022-2024, 2025-2027, 2028-2029, as well as the final target in 2030, following the timelines established in the final rule. For conservatism, the analysis did not take into account the flexibility the Clean Power Plan provides for states to shift emission reductions to later in the compliance period
- Where states were found to over-comply in the early years of the program, surplus allowances or credits were banked for use in later years, as the final rule allows.
- For the “combined” 27-movant state scenario, states were allowed to leverage the flexibility allowed to compliance entities by accessing opportunities across state boundaries – for example, through trading of allowances or credits.

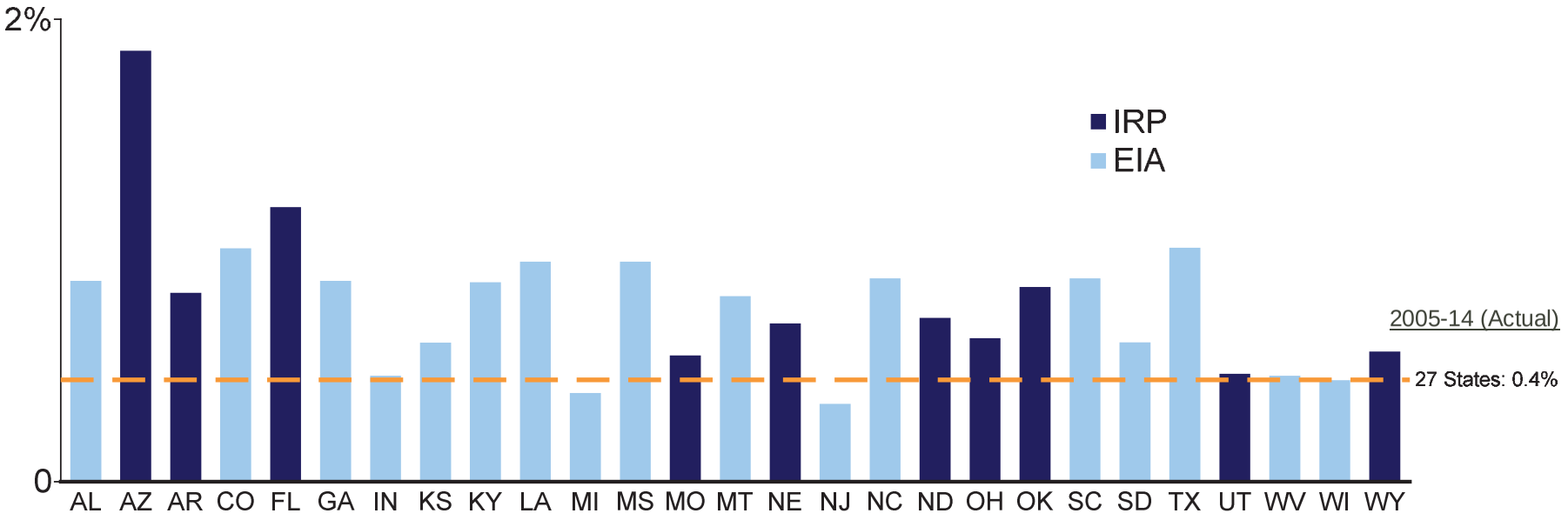
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Average Annual Electricity Demand Growth

(% of sales)

Electricity demand growth rates were used either from the Energy Information Administration's Annual Energy Outlook 2015 projections (also used in EPA's analysis of the Clean Power Plan) or Integrated Resource Plans (IRP), where available. Under the scenarios considered, most of the movant states are assumed to have higher demand growth projected for future years than past recent years.

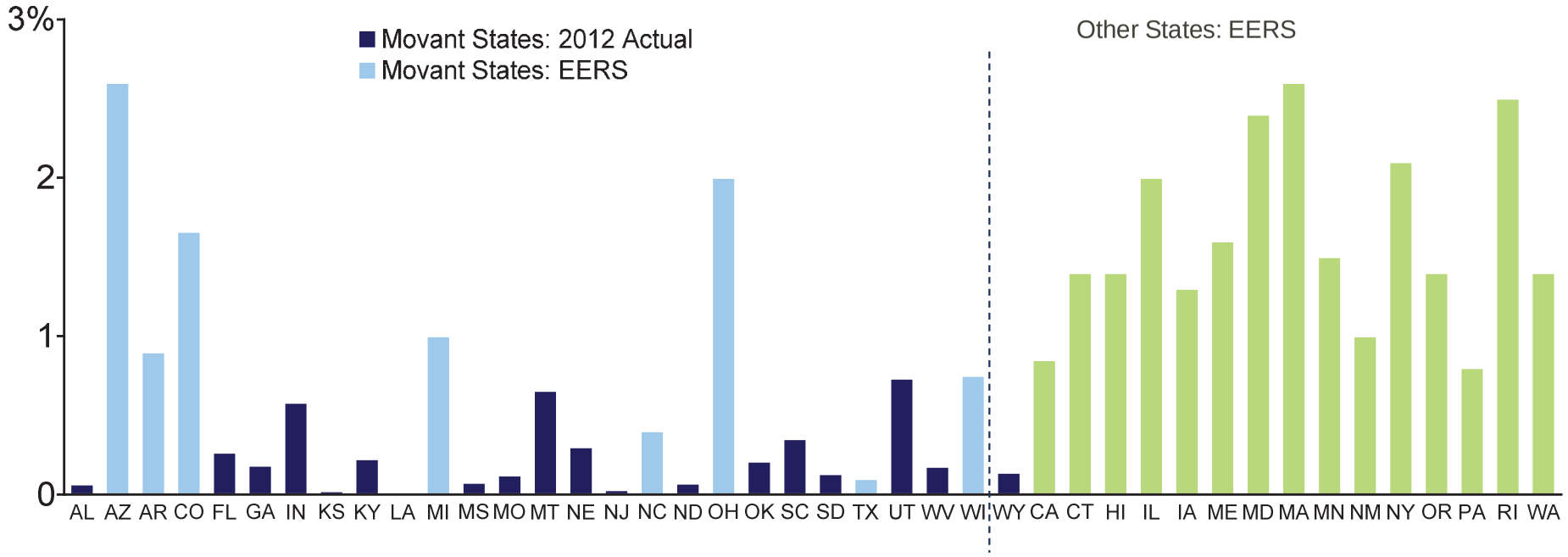


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Average Annual Electricity Efficiency Savings

(incremental; % of sales)

This figure depicts assumed future energy efficiency investments. The analysis assumed that states with energy efficiency requirements on the books (such as energy efficiency resource standards) would continue to see utilities meet those standards. Where those standards did not exist, the analysis assumed that states met recent levels of historical deployment. For comparison purposes this figure also shows states that have committed to deploying significant levels of energy efficiency through energy efficiency resource standards. These states considerably exceed the efficiency improvements the analysis assumed for most movant states.



Note: Annual incremental savings requirements may not apply to 100% of in-state sales. As a result, the effective incremental savings level applied under energy efficiency programs and under this analysis may be substantially lower than indicated on this chart.

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Integrated Resource Plans Considered

The analysis considered the following integrated resource plans from the movant states.

State	Utility	Year of Submission
Alabama	Alabama Power Co.	2013
Arizona	Arizona Public Service Co.	2014
	Tuscon Electric Power Co.	2014
	Arizona Electric Power Cooperative	2012
Arkansas	Entergy Arkansas	2012
	Southwestern Electric Power Co.	2012
Colorado	Xcel Energy	2013
	Boulder City Electric Utility	2013
	Colorado Springs Utility	2012
	Tri-State Gen. and Transmission	2010
Florida	Florida Power & Light Co.	2015
	Duke Energy Florida	2015
	Tampa Electric Company	2015
	Gulf Power	2015
	Orlando Utilities Commission	2015
	JEA	2015
	Seminole Electric Cooperative	2015
	Florida Municipal Power Agency	2015
Georgia	Georgia Power Co.	2013

State	Utility	Year of Submission
Indiana	NIPSCO (NiSourc)	2014
	Indianapolis Power & Light Co.	2014
	Vectren	2014
	Hoosier Energy	2014
	AEP Indiana Michigan Power	2013
	Duke Energy Indiana	2013
	Wabash Valley Power Assoc. Inc.	2013
Kansas	No IRPs submitted	
Kentucky	Louisville Gas & Electric Co. and Kentucky Utilities Co.	2014
	East Kentucky Power Cooperative	2012
	Big Rivers Electric Corp.	2014
Louisiana	Entergy New Orleans	2015
	Entergy LA & Gulf States	2015
	Cleco Power	2015
	Southwester Electric Power Co.	2012
Michigan	AEP Indiana Michigan Power	2013
	Consumers Energy Co.	2015
Mississippi	No IRPs submitted	

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Integrated Resource Plans Considered (continued)

State	Utility	Year of Submission
Missouri	KCP&L	2015
	KCP&L GMO	2015
	Ameren Missouri	2015
Montana	Montana-Dakota Utilities Co.	2015
	NorthWestern Energy	2013
Nebraska	Nebraska Public Power District	2013
New Jersey	Deregulated: No IRP scenario	
North Carolina	Virginia Electric & Power Co. (Dominion)	2015
	Duke Carolinas	2014
North Dakota	Montana-Dakota Utilities Co.	2015
	Otter Tail Power Co.	2014
	Great River Energy	2015
	Minnkota Power Cooperative	2006
Ohio	Duke Energy Ohio	2013
	Appalachian Power Co.	2015

State	Utility	Year of Submission
Oklahoma	Oklahoma Gas and Electric Co.	2015
	AEP Public Service Co. of OK	2012
	Western Farmers Electric Coop.	2014
	Empire District Electric Co.	2012
South Carolina	SC Gas & Electric Co. (SCANA)	2015
	Duke Carolinas	2015
South Dakota	Montana-Dakota Utilities Co.	2015
	NorthWestern Energy	2013
	Black Hills Power	2012
Texas	Deregulated: No IRP scenario	
Utah	PacifiCorp	2015
Wisconsin	Public Service Commission of WI	2012
West Virginia	No IRPs submitted	
Wyoming	PacifiCorp	2015
	Black Hills Power	2011

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DETAILED FINDINGS

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Summary Findings

- All three planned investment scenarios envision the continued expansion of low carbon generation that has been occurring over the last two decades. Both the scenario based on integrated resource plan data, and the two scenarios derived from the Velocity Suite, indicate that power companies have already proposed and are developing significant expansions of wind, solar, and natural gas generating capacity.

- Assuming movant states leverage only existing and planned investments within each state, as many as 21 of the 27 states could comply with the Clean Power Plan through the first three-year compliance period (2022-2024), and as many as 18 of the 27 states could comply through 2030.

- When limiting the analysis to only those projects in the most advanced stages of development (the “advanced development” scenario based on Velocity Suite), 16 of the 27 states could come into compliance through the first three-year compliance period.

- The remaining states can come into compliance by pursuing energy efficiency projects and new generation at a rate comparable to the average of their neighboring states beginning in 2019, after state plans are due.

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Detailed Findings: Advanced Development Scenario

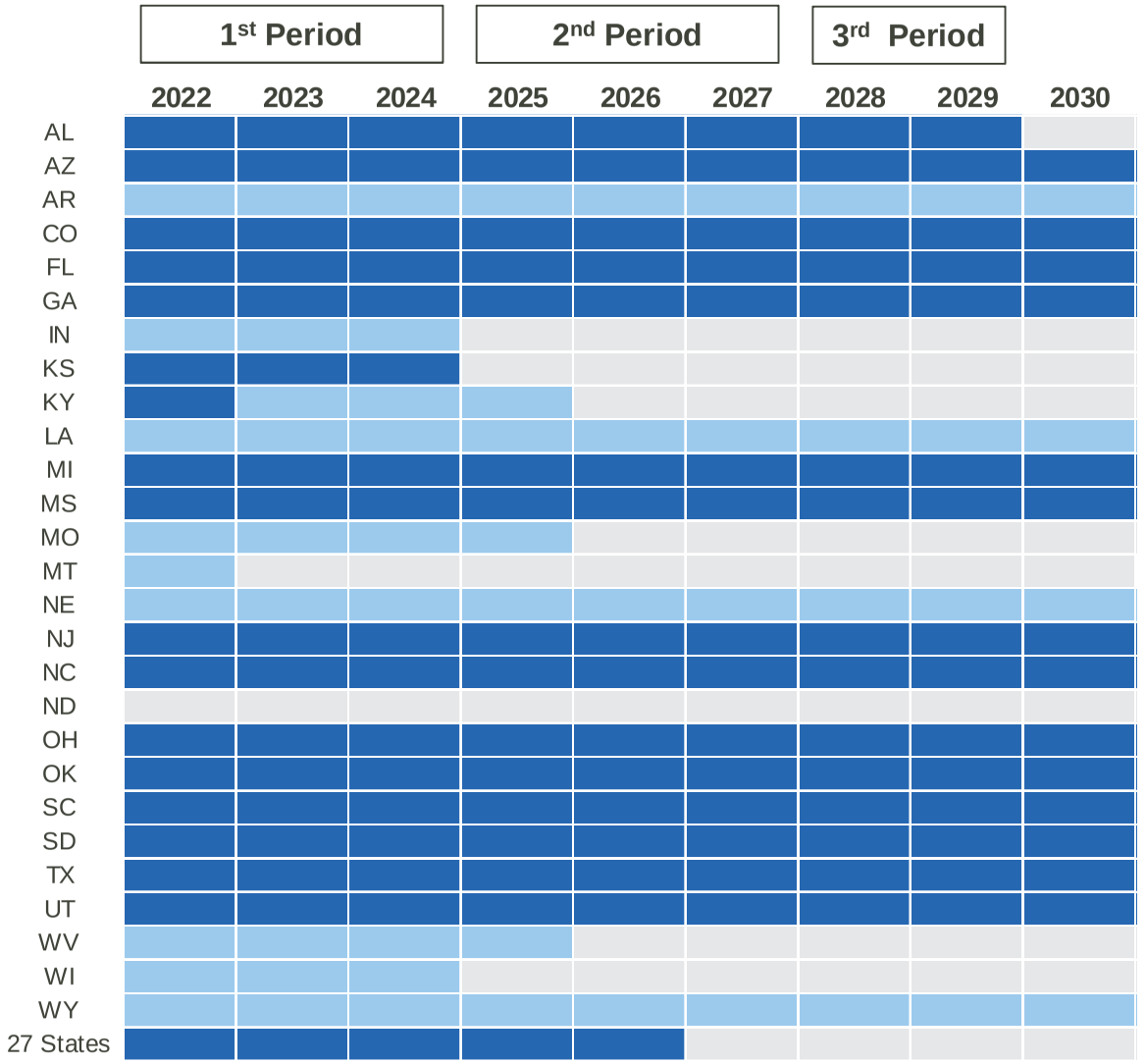
- When considering only the new builds in the most advanced stages of development as well as renewable energy and energy efficiency investments required by state law, the analysis found that 16 of the 27 states could come into compliance through the first compliance period (2022-2024), and 14 of the 27 states could come into compliance all the way through 2030.
- Thus, a majority of movant states achieve compliance in early years or throughout the Clean Power Plan compliance periods relying only through implementation of current state policies (e.g., renewable and efficiency standards) and new generation that is already operating, under construction, or permitted in the state. No additional incremental action is necessary for these states to achieve compliance.
- Of the 11 states that are not in compliance at the start of the program, 9 could come into compliance in the 2022-2024 period merely by pursuing new generation projects at the same rate as the average of their neighboring states.
- The only state that could not come 90 percent or more of the way into compliance – North Dakota – could come into compliance if it instead simply continued to take the same steps in the coming years as they have in the recent past. Specifically we examined what would happen if the state continued to build new wind turbines beginning in 2019 at the same rate it averaged new wind generation from 2010 through 2015.
- New builds in this scenario are only approximately one-third the amount of new builds seen over a comparable historical period (i.e. the last 18 years as the scenarios considered here reflected new builds from 2013-2030).

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Advanced Development Scenario:
State Compliance with the Clean Power Plan (2022-2030)

As shown here, existing and planned investments could bring the vast majority of the 27 movant states into compliance with the Clean Power Plan emission targets through the first compliance period (16 states) — and in many cases, all the way through 2030 (14 states).



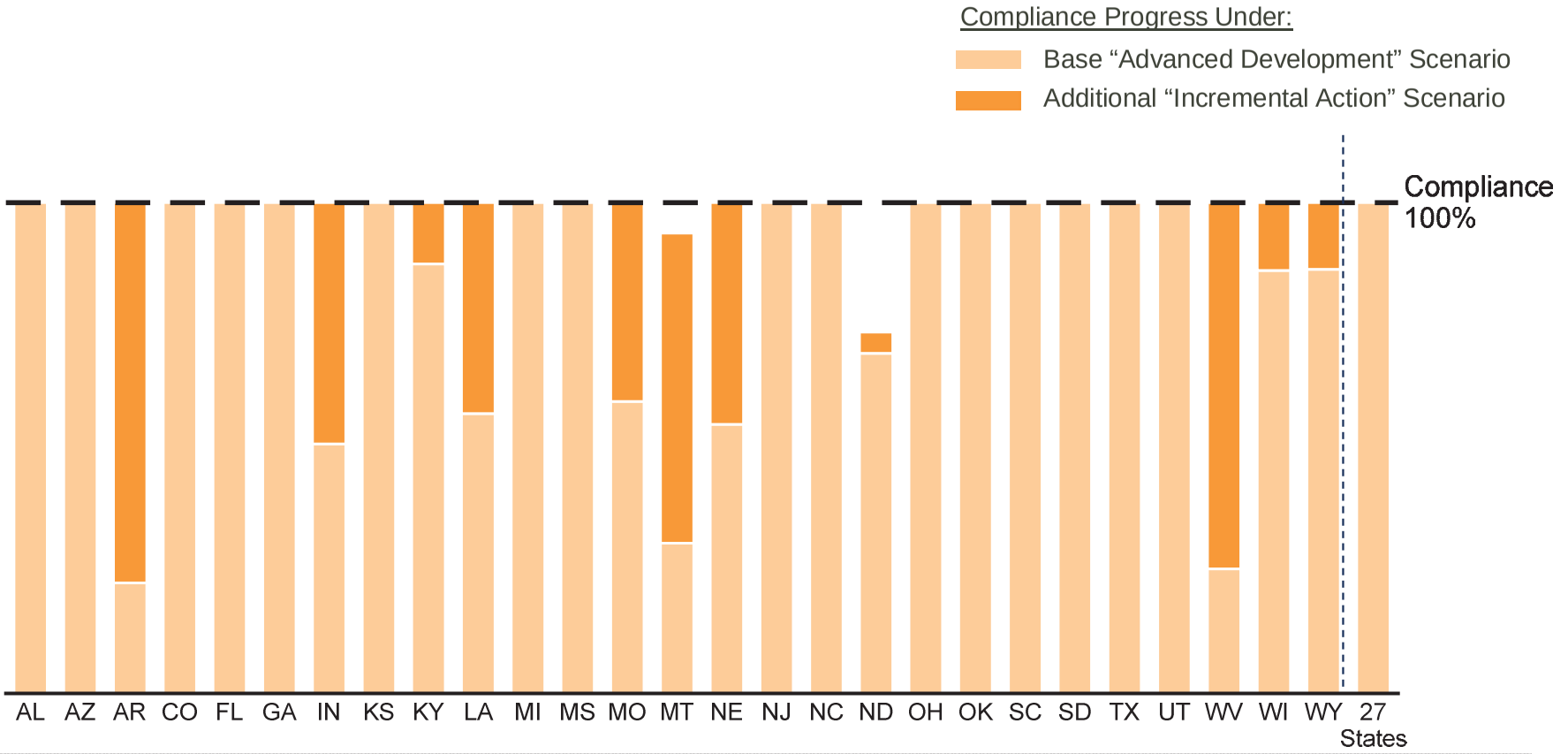
Indicates Compliance Under:

- Base "Advanced Development" Scenario
- Additional "Incremental Action" Scenario

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Advanced Development Scenario:
State Progress in the First Compliance Period (2022-2024)

Under this scenario, the majority of states meet the CO_2-emission reduction targets in the first compliance period. Most states that do not meet their targets could close the gap to fully achieve compliance in the first period by deploying new investments at a rate comparable to their average neighbor. Note that North Dakota can comply by continuing to build new wind generation after 2019 at a rate that mirrors its recent average rate of construction.



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Detailed Findings: Integrated Resource Plans

- This analysis considered the impact of planned projects that were identified by power companies through the integrated resource planning process.
- This analysis was not possible for New Jersey and Texas because they do not apply an integrated resource plan process. In addition, M.J. Bradley & Associates were not able to identify any integrated resource plans for Kansas, Mississippi, or West Virginia.
- The analysis found that 14 of the 22 states considered were in compliance through the first compliance period (2022-2024), and 11 of the 22 states were in compliance through 2030.

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Detailed Findings: Early Development Scenario

- This scenario considered the full range of projects under development in the Velocity database as well as renewable and energy efficiency investments required to comply with state law. This included projects identified as being in stages of "advanced development" as well as those that had permit applications pending and were proposed.

- This scenario found that 20 of the 27 states were in compliance through the first compliance period (2022-2024), and 18 of the 27 states were in compliance through 2030.

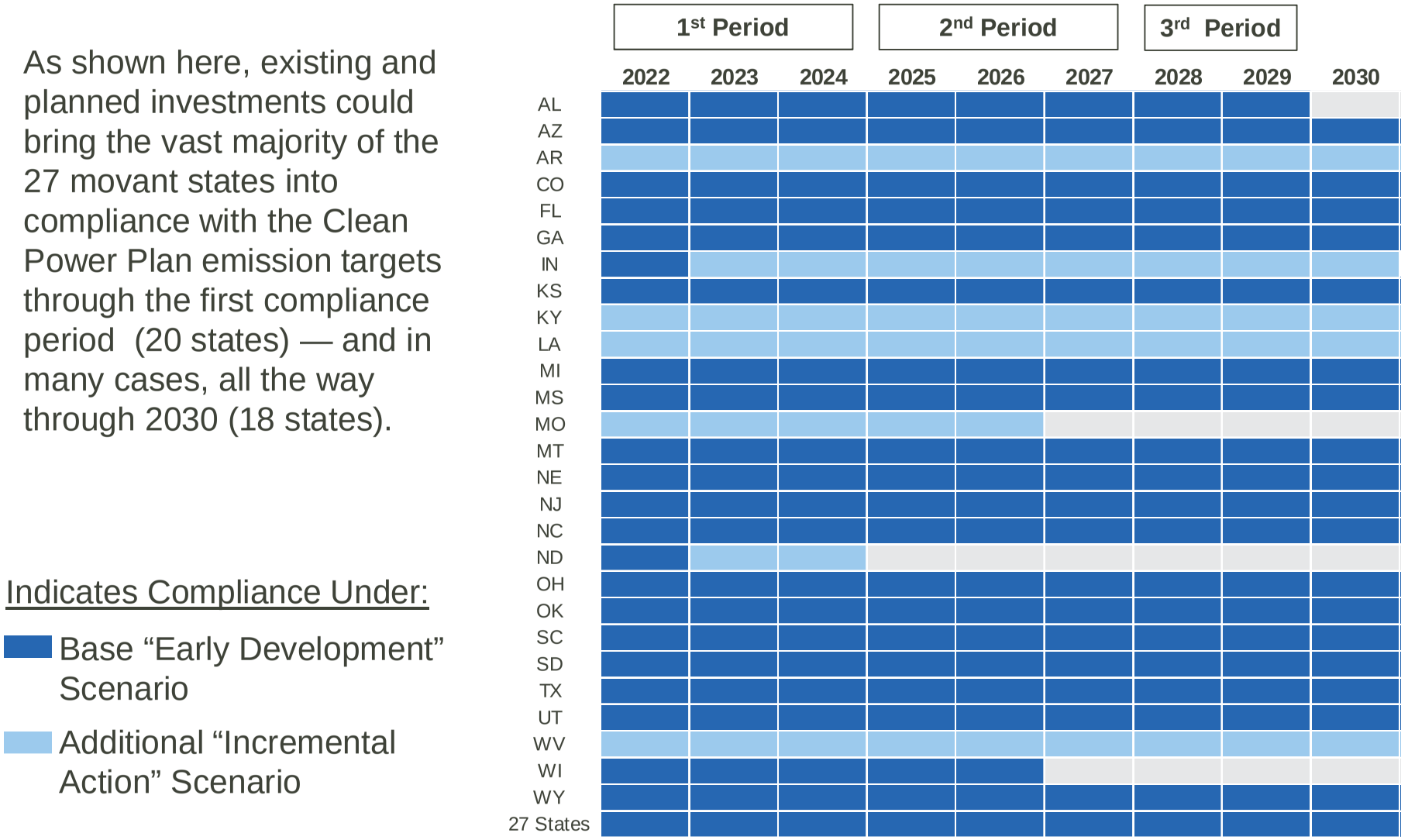
- All states were found to be able to come into compliance in the first compliance period (2022-2024) if they matched their neighbors' average recent historical investments in energy efficiency and generation in the years that followed the deadline for submitting state plans.

- Notably, new builds under the "early development" scenario are more than 20 percent lower than new builds observed over a comparable historical period (i.e., the last 18 years as the scenarios considered here reflected new builds from 2013-2030).

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Early Development Scenario:
State Compliance with the Clean Power Plan (2022-2030)

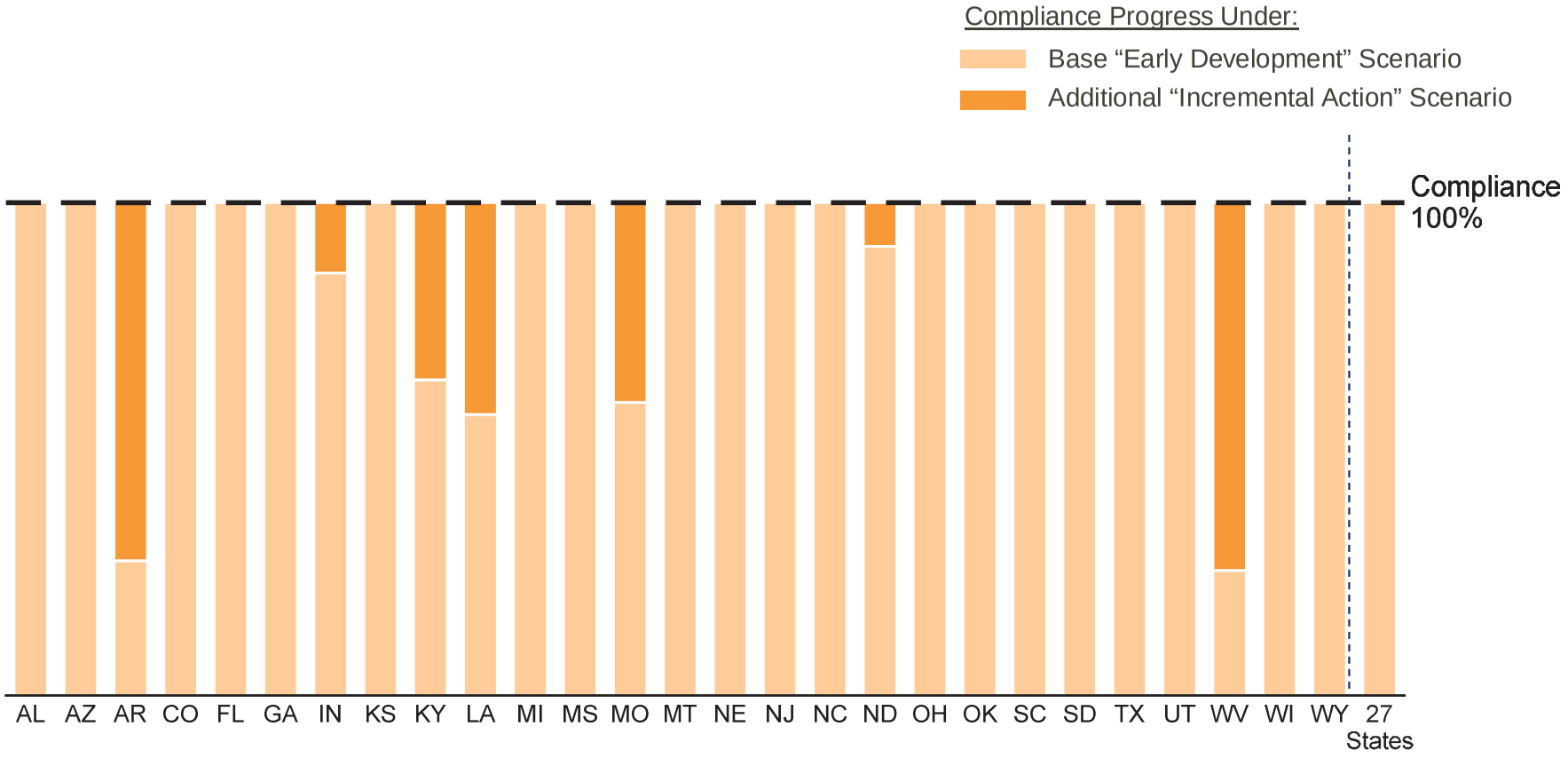
As shown here, existing and planned investments could bring the vast majority of the 27 movant states into compliance with the Clean Power Plan emission targets through the first compliance period (20 states) — and in many cases, all the way through 2030 (18 states).



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Early Development Scenario:
State Progress in the First Compliance Period (2022-2024)

Under this scenario, the majority of states meet the CO_2 emission reduction targets in the first compliance period. States that do not meet their targets could close the gap to fully achieve compliance in the first period by deploying new investments at a rate comparable to their average neighbor.



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Detailed Findings: Collective Action

- As noted, the previous results are based on the assumption that sources within each of the movant states do not take advantage of emission reduction opportunities in other states.

- Under all three of the planned investment scenarios examined, the analysis found that all 27 movant states could collectively achieve compliance in the first compliance period without incremental action if they leveraged cross-border emission reduction opportunities through mechanisms such as interstate trading.

- When considering the early deployment scenario, the analysis found that the 27 movant states could collectively achieve compliance through 2030.

- Notably, this scenario does not account for the ability for these states to leverage opportunities with states outside the group of movant states.

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IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF PAUL J. HIBBARD and ANDREA M. OKIE

I, Paul J. Hibbard, declare as follows:

1. I am a Vice President at Analysis Group Inc., 111 Huntington Avenue, 10th Floor, Boston, Massachusetts, 02199, where I provide policy, economic, and strategy consulting in the electric and natural gas industries. I hold an M.S. in Energy and Resources from the University of California at Berkeley (1991) and a B.S. in Physics from the University of Massachusetts at Amherst (1985).
2. I have worked for twenty-five years as a state official and as a consultant in areas closely related to many of the energy and environmental policies and analysis included in the Environmental Protection Agency's (EPA) final rule

establishing emission guidelines for carbon dioxide pollution from existing power plants (the "Clean Power Plan," or the "Rule").

3. As a state official, I worked in both energy and environmental regulatory agencies in Massachusetts, most recently as the Chairman of the Massachusetts Department of Public Utilities (MA DPU) from 2007 to 2010. Prior to that, I worked in the Electric Power Division of the MA DPU from 1991 to 1998, and in the air quality division of the Massachusetts Department of Environmental Protection from 1998 to 2000. I have also been a member of the Massachusetts Energy Facilities Siting Board, a Manager of the New England States Committee on Electricity, Treasurer and Member of the Executive Committee of the Eastern Interconnect States' Planning Council, and a Representative on the New England Governors Conference Power Planning Committee. My responsibilities in state government included the development of Massachusetts State Implementation Plans under the Clean Air Act (CAA), implementation of various environmental policies related to the power sector, the restructuring of the electric industry, integrated resource planning, general rate and policy regulation of electric and natural gas utilities, and representing the Commonwealth of Massachusetts on regional and national energy councils and committees.

4. From 2000 to 2007, and since 2010, I have worked as a consultant in the field of energy and environmental economics and policy. My work has involved advising state agencies, generation companies, power system operators, and other stakeholders in the electric and natural gas industries on wholesale power market design and operations, power plant valuation and procurement, energy infrastructure valuation, power system modeling, and federal and state energy and environmental policy.

I, Andrea M. Okie, declare as follows:

5. I am a Vice President at Analysis Group Inc., 111 Huntington Avenue, 10th Floor, Boston, Massachusetts, 02199, where I provide policy, economic, and strategy consulting in the electric and natural gas industries. I hold a Master's degree in Public Policy from the University of California at Berkeley (2006) and a B.A. in Economics from Colby College (2000).

6. I have worked for over a decade as a consultant in areas relevant to the agency rulemaking at issue, including assessment of implementation of utility and environmental statutes and regulations by state governments; economic analyses of issues affecting electric utilities, wholesale power markets, and consumers' utility rates; the design of environmental policies to control emissions of air pollutants from the power sector; and the implications of different types of regulation on costs to power producers and to consumers.

We, Paul J. Hibbard and Andrea M. Okie, declare as follows:

7. The purpose of our declaration is to provide information to the court relevant to the question whether EPA's emission reduction requirements, or performance standards (hereafter referred to as final standards), pose imminent, substantial and irreversible harms to the parties moving for a stay of the Clean Power Plan. Specifically, we examine what states achieved in terms of reductions in carbon dioxide (CO_2) emission total quantities (in tons) and emission-rates (in pounds per megawatt-hour (lb/MWh) of electrical output) during the period 2005 – 2013. This analysis places EPA's Clean Power Plan targets in historical context, and demonstrates that comparable reductions in CO_2 emissions have been achieved in the recent past across a wide spectrum of states and electric industry experience. These reductions have taken place without any nationwide policy to reduce greenhouse gas emissions (including the Clean Power Plan), and have been integrated into electricity grid operations as a matter of course, without significant impacts to reliability or electricity prices.
8. In preparing this declaration we bring to bear our extensive experience as advisors to a wide variety of parties (including owners of power plants, state government agencies, non-governmental organizations, grid operators, transmission companies, local distribution utilities, and others) on matters relating to utility and air regulation, including the costs and impacts of

regulation. That experience includes our detailed review of the Clean Power Plan Final Rule, including the main rule and supporting documents and data related to development of the final standards. We have also reviewed data and information cited in context in this declaration.[1]

EPA's Performance Standards

9. In the Clean Power Plan, EPA developed nationally applicable emission performance rates for affected, existing electric generating units, and translated those performance rates into state-specific goals that reflect the specific electricity generation composition of each state. The state goals are expressed both as a state-wide carbon dioxide emission intensity "rate" (i.e., lbs/MWh) and as a state-wide "mass" limitation (i.e., tons). States may apply either the nationally applicable performance rates or a state-wide rate requirement for affected sources, and may allow those sources the flexibility to pursue lower cost emission reductions through the trading of emission reduction credits. Alternatively, states may apply a single mass-based standard to existing

[1] For example, the materials we relied upon include the Energy Information Administration's (EIA) EIA-861 data file for 2005 - 2013 (containing electric power sales, revenues, and energy efficiency data); North Carolina Clean Energy Technology Center's Database of State Incentives for Renewables & Efficiency (DSIRE) database; power plant- and unit-level data for the years 2005-2013 from SNL Financial; the CO_2 Emission Performance Rate and Goal Computation Technical Support Document for the Clean Power Plan Final Rule; and the New Source Complements to Mass Goals Technical Support Document for Clean Power Plan Final Rule.

generating units. To maximize flexibility for regulated entities, EPA has also provided the option for trading of emission allowances that in total equal the mass-based standard.

10. EPA has provided the states with flexibility to adopt a compliance plan appropriate to the unique circumstances and interests of each state. Each state can choose what goes into their plans, including whether they will achieve emissions reductions exclusively through measures within their borders, or by allowing regulated generating units to access emission reduction opportunities in other states.

11. The final Clean Power Plan provides for a gradual phase-in of required emission reductions beginning in 2022 through 2030. Under the rule, states must apply emission limitations beginning in 2022, and achieve interim emission reduction requirements that decrease gradually through 2030. States have the flexibility to determine a state-specific "glide path" during this interim compliance period, allowing regulated generating units to defer emission reductions to later in the decade so long as the interim emission targets are met on average over the period from 2022-2029. States may also voluntarily take advantage of options to begin compliance sooner than 2022 through early compliance opportunities.

12. In addition, EPA has allowed states to implement or to continue mass-based trading programs that cover both existing and new EGUs. Consequently, it identifies "new source complements" that states can add to the EPA mass targets for the purpose of implementing "all-source" mass-based programs.

13. In order to provide an easily understood comparison of the CO_2 emission reductions contemplated in the Clean Power Plan, with historical changes already underway in U.S. CO_2 emissions, we translate the total reduction that must be achieved from affected units under the Rule into equivalent *annual average* emission reduction values, on a rate basis (*annual average* reduction in CO_2 emission intensity, in tons/MWh) and on a mass basis (*annual average* reduction in total mass of CO_2 emissions from affected EGUs, in tons). We calculate these implied annual average emission reduction values under the Clean Power Plan using baseline emissions as a starting point (i.e., EPA's assumed emissions by state in 2012), and assuming that states may begin achieving reductions in 2019, after completion of state plans.[2] Finally, we estimate the implied annual average emission reductions on a mass basis with and without the new source complements, and we compare the resulting average annual reductions with historical average annual reductions in CO_2.

[2] As noted below, see ¶ 20, in our view the assumption that no emission reductions take place before 2019 yields a conservative assessment of annual average changes in emissions under the Clean Power Plan.

14. The actual historical average annual emission reductions we use for comparison with the Clean Power Plan's requirements are those achieved across affected units that operated over the recent historical period, covering the eight-year period stretching from 2005 to 2013. This represents the most recent period of CO_2 emission history equivalent to EPA's compliance period (eight years). For comparison to the Clean Power Plan's implied annual average emission reductions, we estimate historical average emission reductions in two ways: first, to compare with EPA's requirements on existing units, we estimate historical emission reductions including only those units in operation in 2005. Second, for comparison with EPA's reductions including new source complements, we estimate historical emission reductions including units in operation in 2005, and new units added over the period 2005 to 2013.

Methods Used to Examine Historic Trends as Compared to EPA's CO_2 Emission Reduction Requirements

15. In the Clean Power Plan and associated documents, EPA considered the availability of well-established options for reducing emissions of CO_2 through: (1) improvements in the efficiency of generation at coal-fired steam units; (2) meeting the same level of electricity demand by increasing gas-fired generation and decreasing coal-fired generation; and (3) meeting the same level

of electricity demand by increasing renewable generation and by decreasing fossil fuel-fired generation.

16. EPA determined that the identified emission reductions could reasonably be achieved by states and by affected units over the compliance period through application of one or more of these approaches. However, states and regulated generating units are not limited to these options in meeting the emission reduction requirements of the Clean Power Plan. States and regulated generating units can draw on other well-established methods of reducing CO_2 emissions, including demand-side energy efficiency and fuel switching at regulated generating units, in order to meet state emission limitations.

17. Here, we evaluate the extent to which individual states have achieved reductions in emissions of CO_2 and, if so, how the rates of state-specific emission reductions (on both a rate and mass basis) compare to our estimate of annual average state-specific CO_2 emission reductions associated with Clean Power Plan requirements. The goal of our analysis is to provide additional evidence – based on actual state-specific historical accomplishments in reliance on the same general types of measures and actions included in EPA's building block assumptions – to show that the Clean Power Plan does not impose on the states significant imminent irreversible harms.

18. In order to test the robustness of our findings across different economic, demographic and industry conditions, we review states of different sizes and geographies, different industry structures, different wholesale electricity market conditions, different electric generating resource mixes, and different mixes of electricity demand (residential, commercial/industrial). We review states' CO_2 emission reduction histories considering changes in electricity demand and supply resource mix that may explain the outcomes, with a specific focus on the types of potential changes evaluated in the Clean Power Plan's building block analysis. We also conduct more detailed case study reviews for several specific states.

19. In sum, we calculate what has happened with CO_2 emissions across all 47 states affected by the Clean Power Plan. We specifically estimate the *annual average change* in CO_2 emissions (tons) and emission rates (tons/MWh) across all states. Finally, since EPA has allowed for states to roll new sources into compliance plans, we calculate state changes in CO_2 emissions over the historical period in two ways: (1) including only affected, existing units in operation at the beginning of the historical period (2005) ("Affected Existing Units"), and (2) including those units plus additions of new units over the full historical period (2005-2013) ("All Existing Units"). The latter calculations are

relevant for states that seek to include both existing and new units in Clean Power Plan compliance plans.

20. All comparisons estimate Clean Power Plan annual average requirements assuming power companies defer any action to reduce emissions until 2019, after state plans have been submitted to EPA. As noted below, *see* ¶29, the power sector is expected to add significant new low and zero-emitting generating capacity and expand investments in end-use energy efficiency over the next few years. Given these current trends and the recent emission reductions analyzed in this declaration, it is reasonable to expect the power sector would actually continue to reduce emissions through 2019. This suggests that our assumption that no emission reductions take place before 2019 yields a conservative assessment of annual average changes in emissions under the Clean Power Plan.

Analysis Results

21. Our review of historical changes in emissions reveals that many states already have achieved significant reductions in CO_2 emissions and emissions rates during the analysis period we studied, largely driven by prevailing market trends. These reductions have been achieved without significant impacts to reliability or electricity prices. In addition, reductions have occurred despite the absence of any federal policies to control emissions of CO_2 from the electric

sector. These results demonstrate that the reasonable pace of change in power sector CO_2 emissions required by the Clean Power Plan is not only possible in theory, but has been achieved in practice. Specifically, a large number of states have achieved emission reductions in rates per unit generated (lbs/MWh) and in amounts (tons) that exceed the annual average emission reductions implied under the Clean Power Plan. This result is found across a wide variety of ways of looking at the data, as described in the following paragraphs.

22. *The nation has achieved significant reductions in emissions of CO_2 over the eight-year historical period.* This is true whether calculating emission reductions on a rate basis or a mass basis, and whether one includes only existing units at the start of the period, or existing units plus new units added over time. Further, the nation continued to achieve significant reductions in CO_2 in particular over the period 2010-2013, while state economies were generally experiencing economic growth following the economic recession. **Exhibits 1A and 1B** show the results, presenting historical emissions and emission rates of affected units, including only those units existing as of the beginning of the period, and existing units plus new units added through 2013. **Exhibit 1A** shows total U.S. CO_2 emissions, in thousand short tons, from 2005 to 2013 of affected units existing in 2005 and all affected units from 2005 to

2013. **Exhibit 1B** shows CO_2 emission rates, in tons of CO_2 per MWh, for the same categories.

23. *A wide diversity of states has achieved reductions in emissions of CO_2 well in excess of the national average rate of reductions over the period 2005-2013*. This is true whether considering only the affected power plant units in states that were in operation in 2005, or considering those units plus new power plant units added through 2013. **Exhibits 2A and 2B** show states' average annual CO_2 emissions reductions from affected units (2005 units only, and all affected units, respectively) over the period 2005-2013. As can be seen, 44 of the 47 states achieved reductions over this period, with a national average rate of reduction of 2.76 percent per year of baseline (2005) emissions when looking at 2005 affected units. When considering all affected units, 34 of 47 states achieved reductions with a national average rate of reduction of 1.70 percent of baseline emissions.

24. *A state's ability to achieve levels of reductions in emissions of CO_2 comparable to Clean Power Plan requirements is not tied to any particular characteristic – instead, these reduction levels have been achieved across a wide variety of states, including those in different geographic regions, with different fuel mixes, different levels of industrial/commercial versus residential electricity consumption, different electric industry structures, and different levels of*

growth in renewable resources. **Exhibits 3A through 3D** display the diversity of states accomplishing significant levels of emission reductions over the past eight years. This includes:

- States with significant dependence on coal for electricity generation – including, for example Tennessee and North Carolina (see **Exhibit 3A**);
- States that have made significant transitions from higher-carbon fuels to lower-carbon fuels – including, for example Florida and Delaware that have significantly increased gas-fired generation, and Maine which has significantly increased non-biomass renewable generation (see **Exhibit 3B**);[3]
- States with different electricity industry structures – including states that have restructured electric industries or operate in competitive wholesale market regions, such as Maryland and New Jersey, and states with traditional vertically-integrated structures, such as South Carolina and Georgia (see **Exhibit 3C**);
- States with a higher proportion of electricity demand from commercial and industrial customers – including, for example, Ohio and Minnesota (see **Exhibit 3D**); and
- States in every region of the country.

[3] We focus here on non-biomass renewable generation because all non-biomass renewable resources are eligible for compliance under the Clean Power Plan. Maine increased non-biomass renewables by approximately 9.6 percent of in-state generation between 2005 and 2013.

25. *Importantly, a wide-ranging group of states, with diverse geographies, demographics, fuel mixes, industry structures, and customer bases, have achieved levels of emission reductions that are equal to or greater than those required by EPA under the Clean Power Plan.* By way of example, **Exhibits 4 through 7** show how several states' historical CO_2 emission reductions compare to the rate of reductions implied in the Clean Power Plan (in all cases examining affected existing units in operation at the beginning of 2005).

- **Exhibit 4A** shows the results for the state of Tennessee, a state with traditionally heavy coal use. As can be seen, Tennessee achieved emission reductions over the historical period of 5.0 percent per year, compared to the average emissions reductions that the Clean Power Plan implies for the state under our methodology (2.9 percent per year). **Exhibit 4B** shows the fuel mix of electric generating resources in Tennessee between 2005 and 2013.
- **Exhibit 5A** shows the results for the state of Ohio, a state with high consumption of electricity by commercial/industrial customers, compared to other states. As can be seen, Ohio – which made significant investments in energy efficiency over this period – achieved emission reductions over the historical period of 2.6 percent per year, in excess of the Clean Power Plan reductions we calculated for the state (2.5 percent per year). **Exhibit 5B** shows the breakdown of residential-commercial-industrial electricity use in

the state. Further, Ohio in particular achieved significant reductions in CO_2 emissions during the most recent three-year period, at a time when the state was experiencing strong economic growth. **Exhibit 5C** compares Ohio's average annual reduction to our calculation of the reductions under the Clean Power Plan, alongside the level of growth in Gross Domestic Product during this time period.

- **Exhibit 6A** shows the results for the state of Florida, a state that has experienced a significant amount of fuel switching, to natural gas from coal and oil-fired resources. As can be seen, Florida achieved emission reductions over the historical period of 4.6 percent per year, compared to the average emission reduction that we calculated the Clean Power Plan would imply for the state (1.4 percent per year). **Exhibit 6B** shows the fuel mix of electric generating resource in Florida between 2005 and 2013.
- **Exhibit 7A** shows the results for the state of Minnesota, a state that has experienced significant growth in renewable generation. As can be seen, Minnesota achieved emission reductions over the historical period of 3.2 percent per year, in excess of the rate of reduction implied by the Clean Power Plan for the state (3.1 percent per year). **Exhibit 7B** shows the fuel mix over time for Minnesota.

CONCLUSIONS

26. Our analysis compares the implied annual average emission and emission rate reduction targets in the Clean Power Plan to the recent experience of states affected by EPA's action. The purpose of our analysis is to put the Clean Power Plan reduction targets into historical context, and view the rate- and mass-based standards against the wide range of economic, industry, and demographic changes that have occurred across the states over a recent time period selected to match the compliance period under the Clean Power Plan. While EPA has specifically assessed the feasibility of the Clean Power Plan's requirements, a review of the historical record can provide additional insights into the practicality and feasibility of states achieving EPA's targets over the compliance period in question.

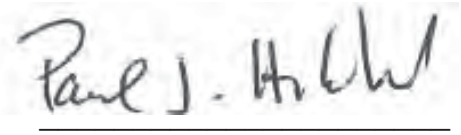
27. In order to explore the robustness of our results, we reviewed the historical record both on an aggregate and individual state basis, under definitions of affected sources including those in operation at the beginning of the historical period and including new sources added over time, and across a diverse cross section of states based on different geographies, electricity resource mixes, demographics, and industry structures.

28. Our results demonstrate that many states and groups of states have achieved reductions in CO_2 emissions at rates equivalent to or greater than that required

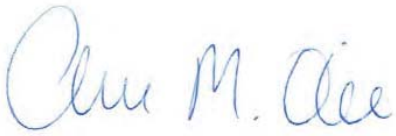
under the Clean Power Plan. Moreover, this progress has been achieved in a wide variety of states – including states with widely varying geographies, industry structures, fuel mixes, and customer bases. This supports the conclusion that states should be able to meet or exceed the performance standards of the Clean Power Plan, over the time frame set forth by EPA to achieve the performance standards under the rule, and that states will not be significantly harmed in the near term during the period in which this litigation is being decided.

29. This conclusion is further supported by other declarations filed in this litigation, which confirm that there are significant investments in renewable energy generation, natural gas generation, demand-side energy efficiency, and other low or zero-emitting resources planned or expected over the coming years. See, e.g., Tierney Decl. ¶ 49, 51, 54. At the same time, the Clean Power Plan is vital in providing long-term economic incentives and market signals to ensure that these trends continue into the next decade – and to ensure that the power sector as a whole utilizes these investments in such a way as to maximize emission reductions.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on the 7th of December, 2015.



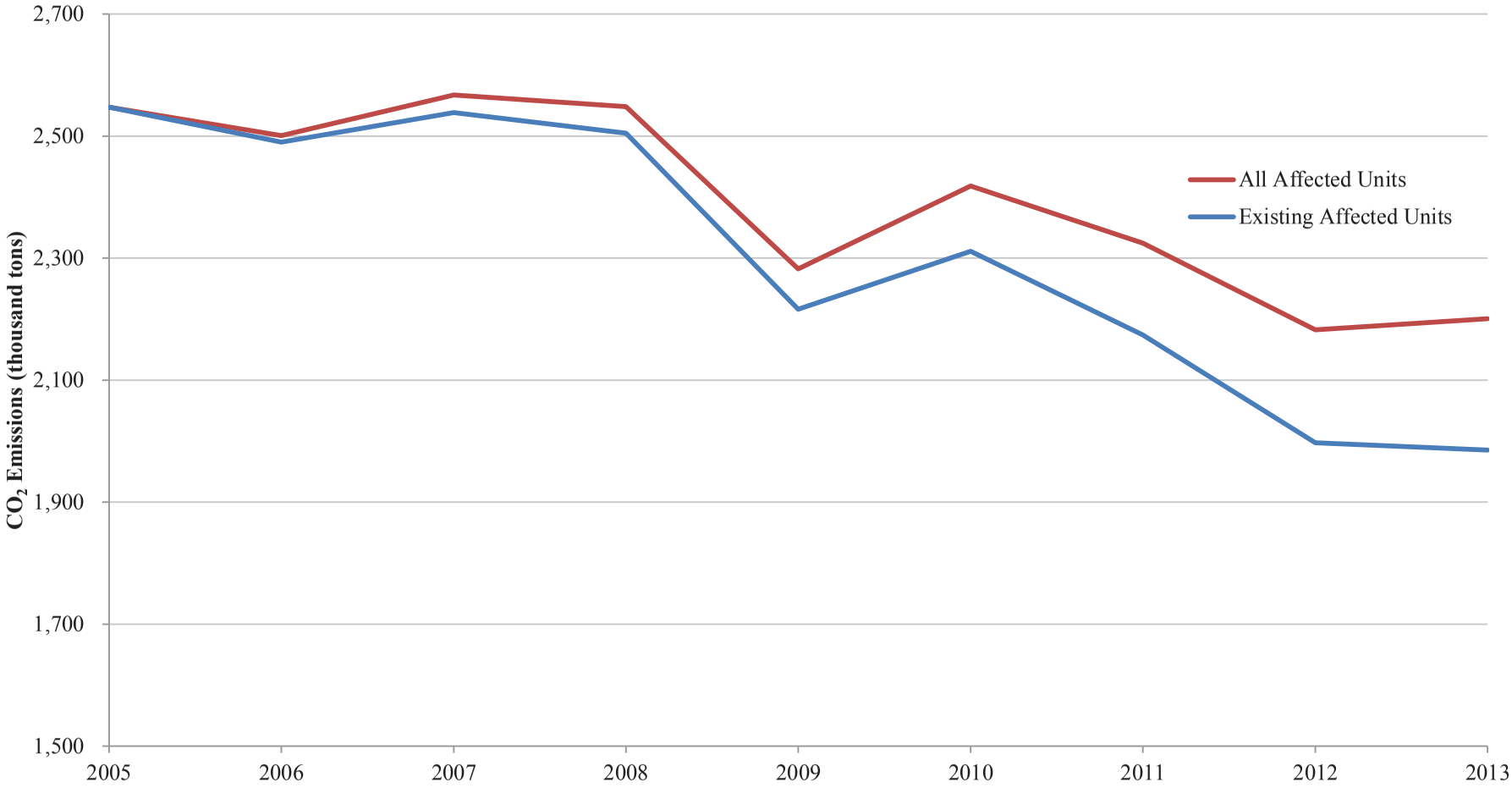
Paul Hibbard



Andrea Okie

Exhibit 1A

CO_2 Emissions for All Affected Units Have Fallen by 14 Percent Since 2005 and 22 Percent When Considering Emissions from Existing Affected Units Only

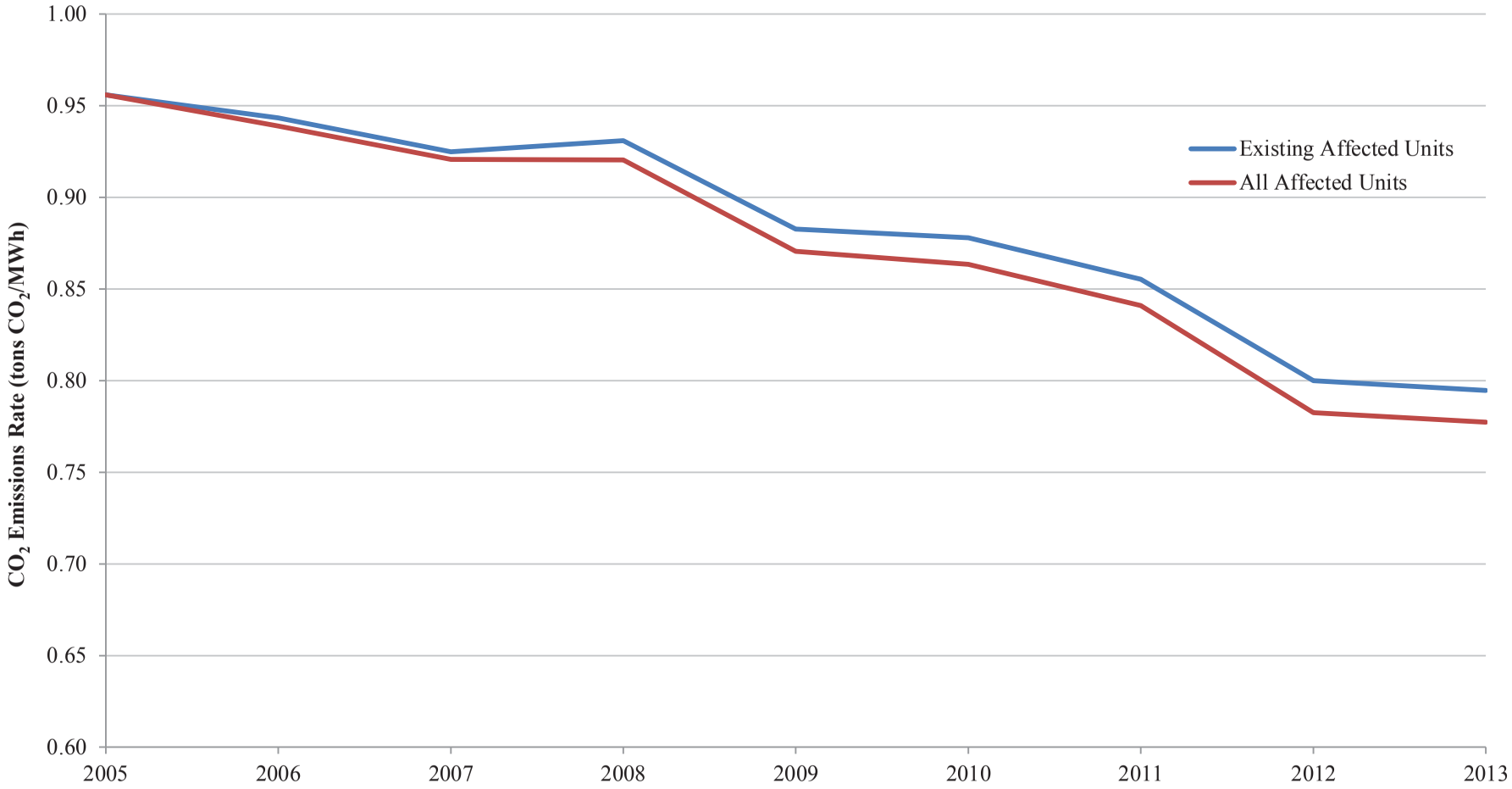


Notes:
[1] Historical emissions for existing affected units are calculated by summing CO_2 emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [3] Historical emissions for all affected units include emissions from all affected units that are online during the 2005-2013 period. [4] We include new units added during the 2005-2013 period in our analysis of all affected units in order to match the Clean Power Plan's inclusion of a new source complement option.
Source: SNL Financial.

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Exhibit 1B

The CO_2 Emissions Rate for All Affected Units Has Fallen by 19 Percent Since 2005 and 17 Percent when Considering Emissions from Existing Affected Units Only



Notes:

[1] Historical emissions for existing affected units are calculated by summing CO_2 emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [3] Historical emissions for all affected units include emissions from all affected units that are online during the 2005-2013 period. [4] We include new units added during the 2005-2013 period in our analysis of all affected units in order to match the Clean Power Plan's inclusion of a new source complement option.

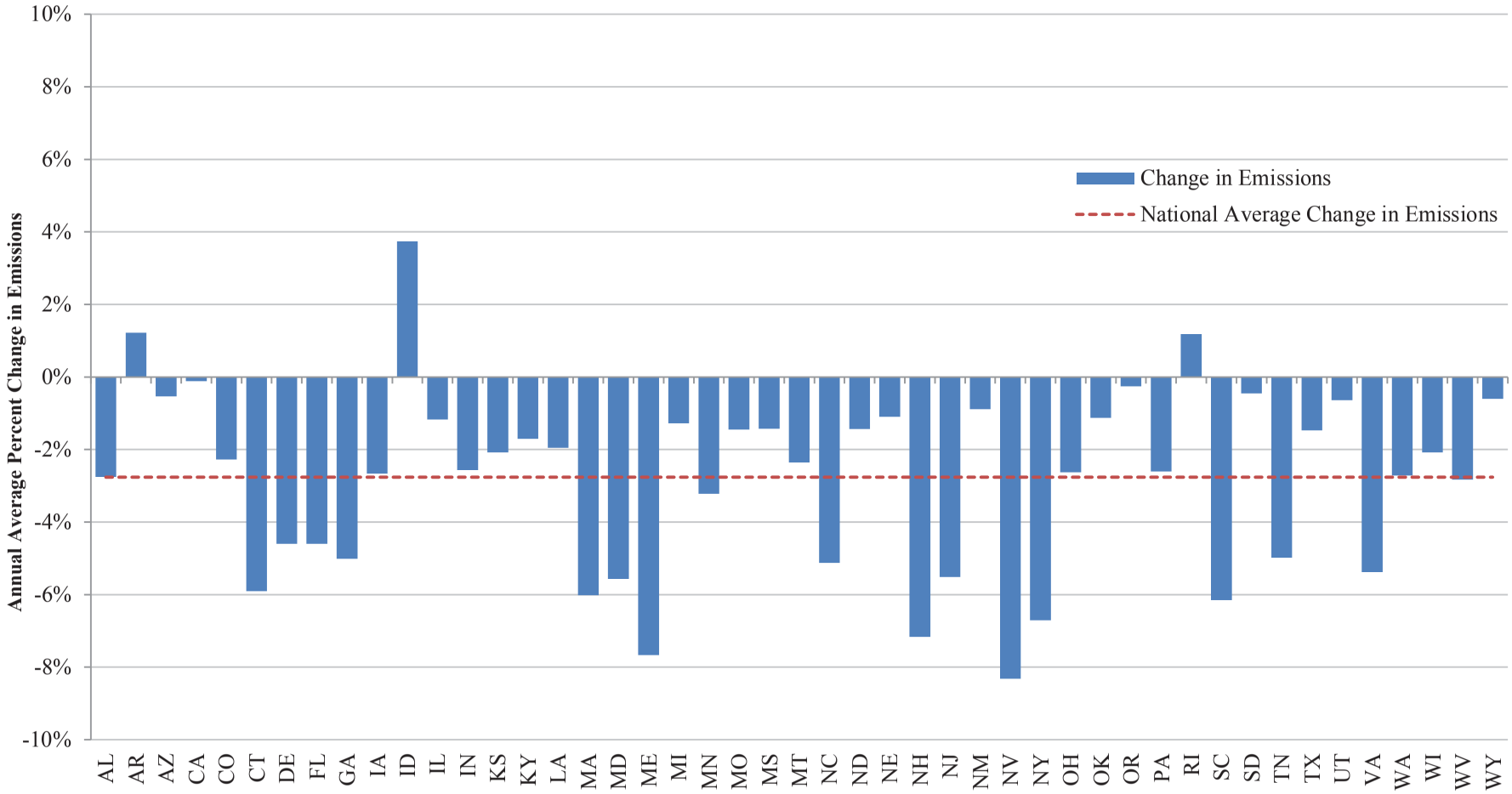
Source: SNL Financial.

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Exhibit 2A

CO_2 Emissions from Existing Affected Units Have Fallen in Nearly Every State Since 2005

This figure shows the annual average percent change in emissions from existing affected units over the period 2005-2013.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012.

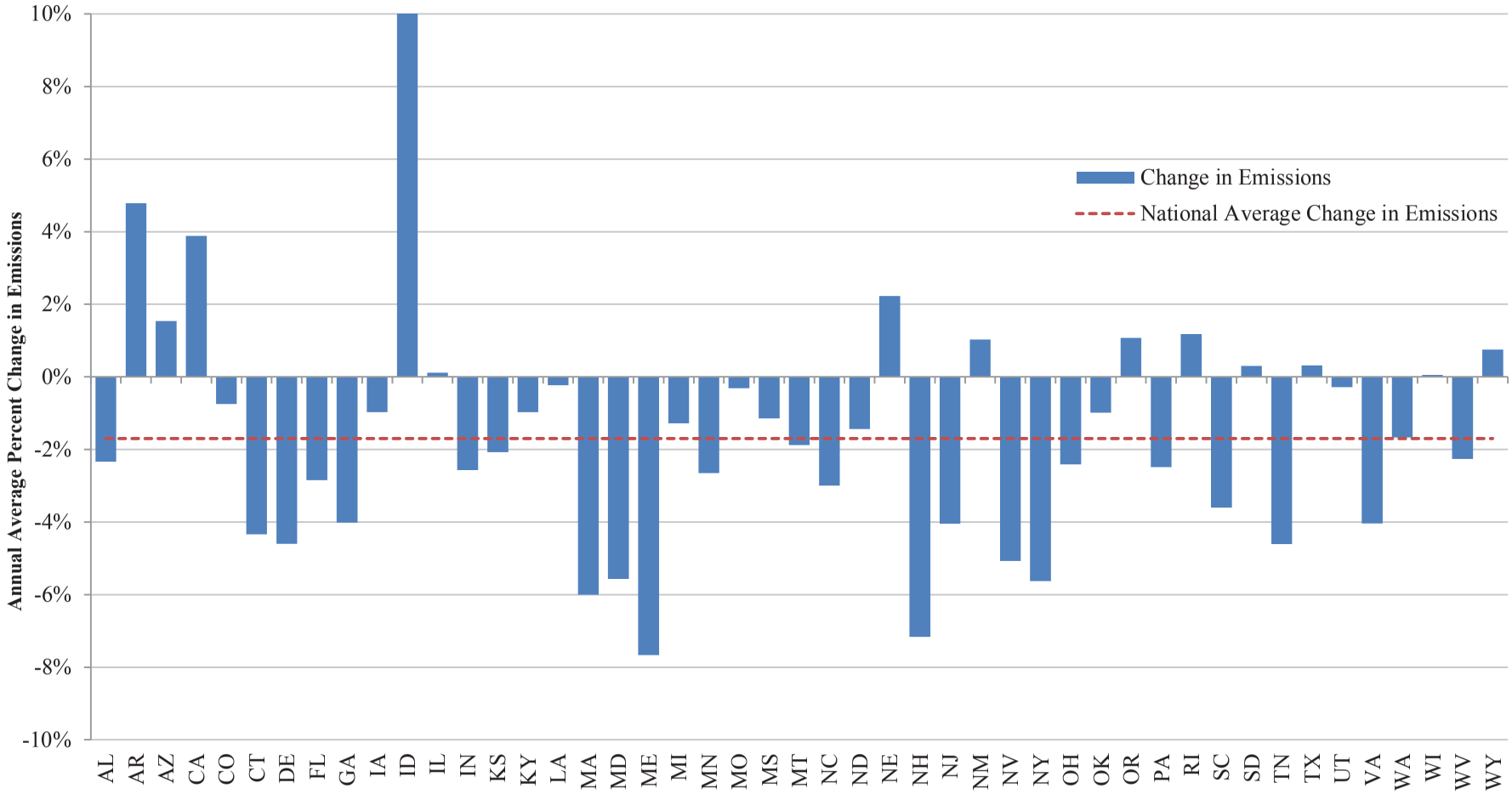
Source: SNL Financial.

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Exhibit 2B

CO_2 Emissions from All Affected Units Have Fallen in Nearly Every State Since 2005

This figure shows the annual average percent change in emissions from all affected units over the period 2005-2013.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online during the 2005-2013 period that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [4] Y-axis has been truncated at 10%. The average annual percentage change in emissions levels for all affected units in Idaho from 2005-2013 was 16.2%.

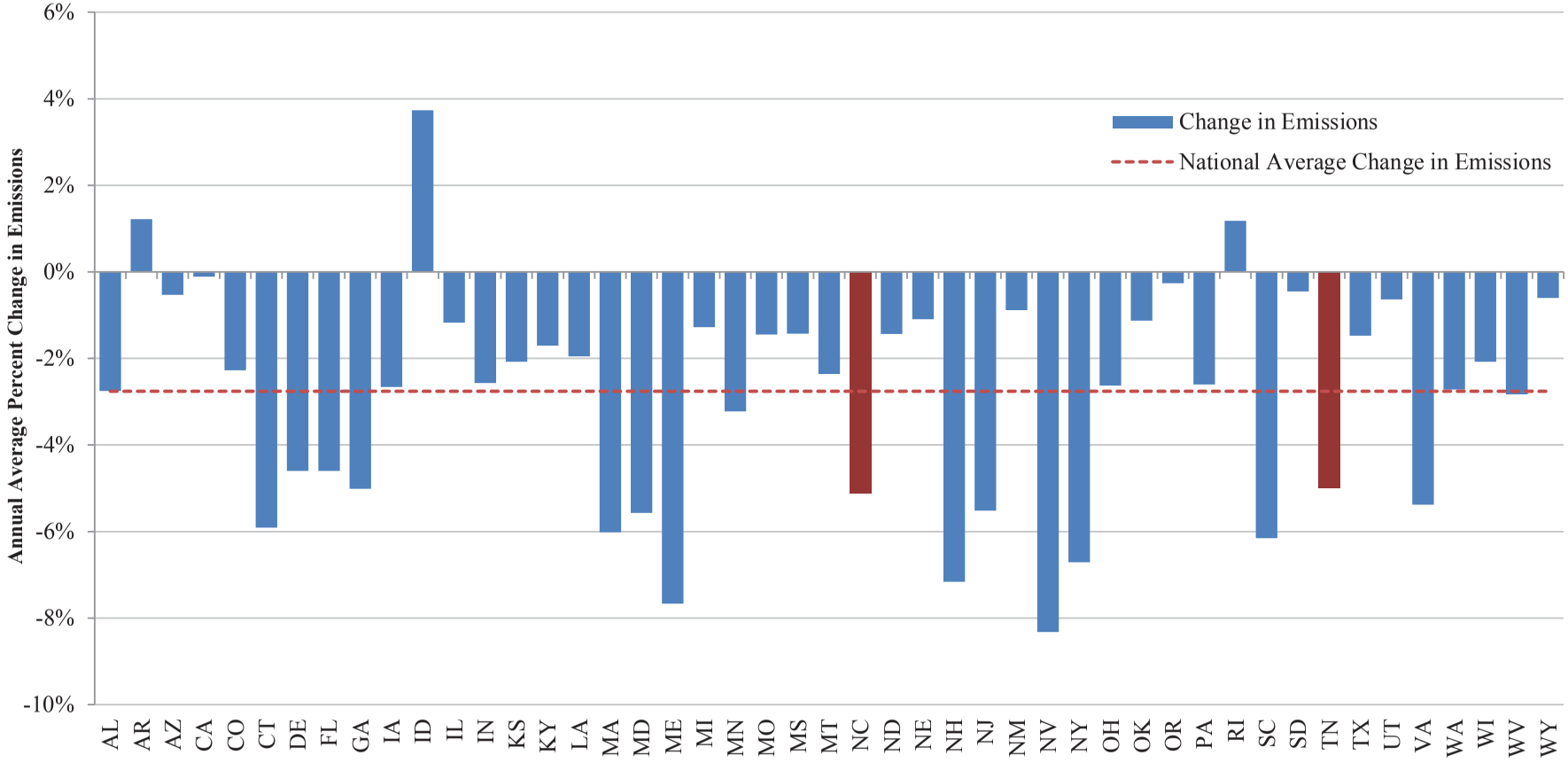
Source: SNL Financial.

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Exhibit 3A

North Carolina and Tennessee Provide Two Examples of Coal Heavy States That Have Experienced Significant Reductions in Emissions of CO_2

This figure shows the annual average percent change in emissions from existing affected units over the period 2005-2013 for all states. North Carolina and Tennessee are highlighted in red. The dotted line indicates the national average.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012.

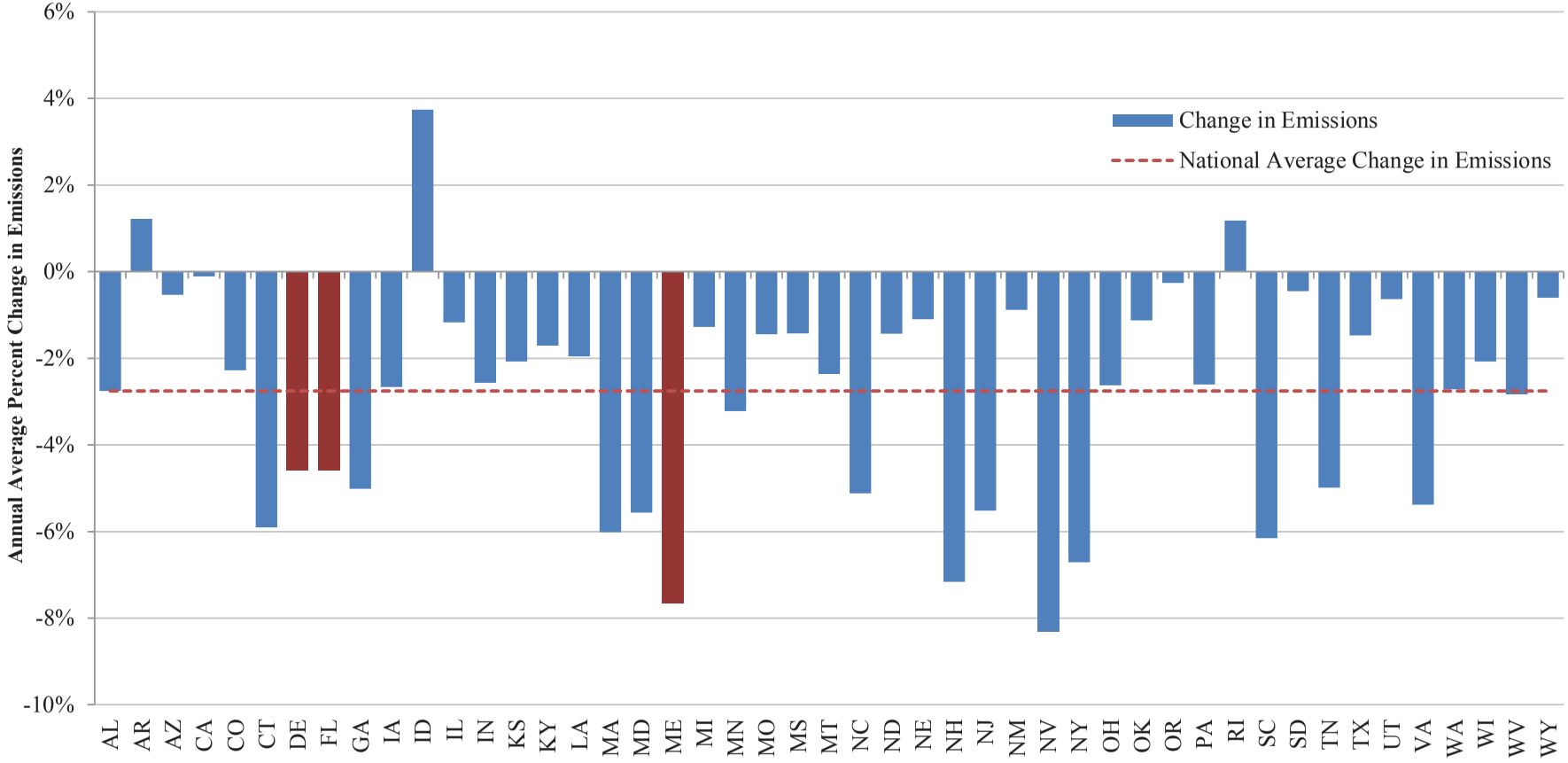
Source: SNL Financial.

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Exhibit 3B

Several States Have Significantly Reduced Emissions of CO_2 While Transitioning From Higher-Carbon Fuels to Lower-Carbon Fuels

Florida and Delaware reduced emissions by significantly increasing gas-fired generation, while Maine significantly increased non-biomass renewable generation. This figure shows the annual average percent change in emissions from existing affected units over the period 2005-2013 for all states. Florida, Delaware, and Maine are highlighted in red. The dotted line indicates the national average.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012.

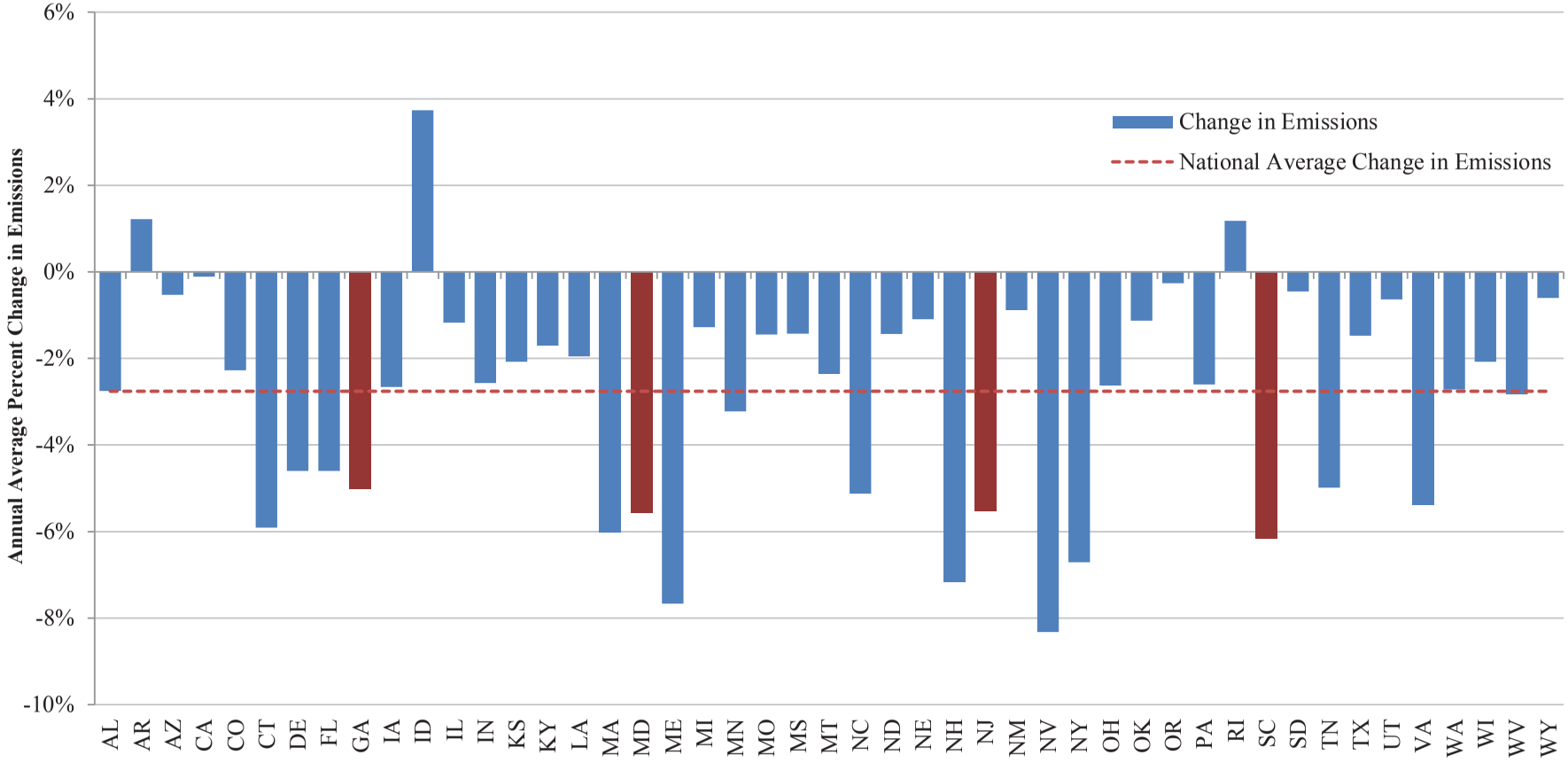
Source: SNL Financial.

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Exhibit 3C

States with Restructured Electric Industries (New Jersey and Maryland) Have Significantly Reduced Emissions of CO_2, as Have States with Traditional Vertically-Integrated Structures (South Carolina and Georgia)

This figure shows the annual average percent change in emissions from existing affected units over the period 2005-2013 for all states. Georgia, Maryland, New Jersey, and South Carolina are highlighted in red. The dotted line indicates the national average.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012.

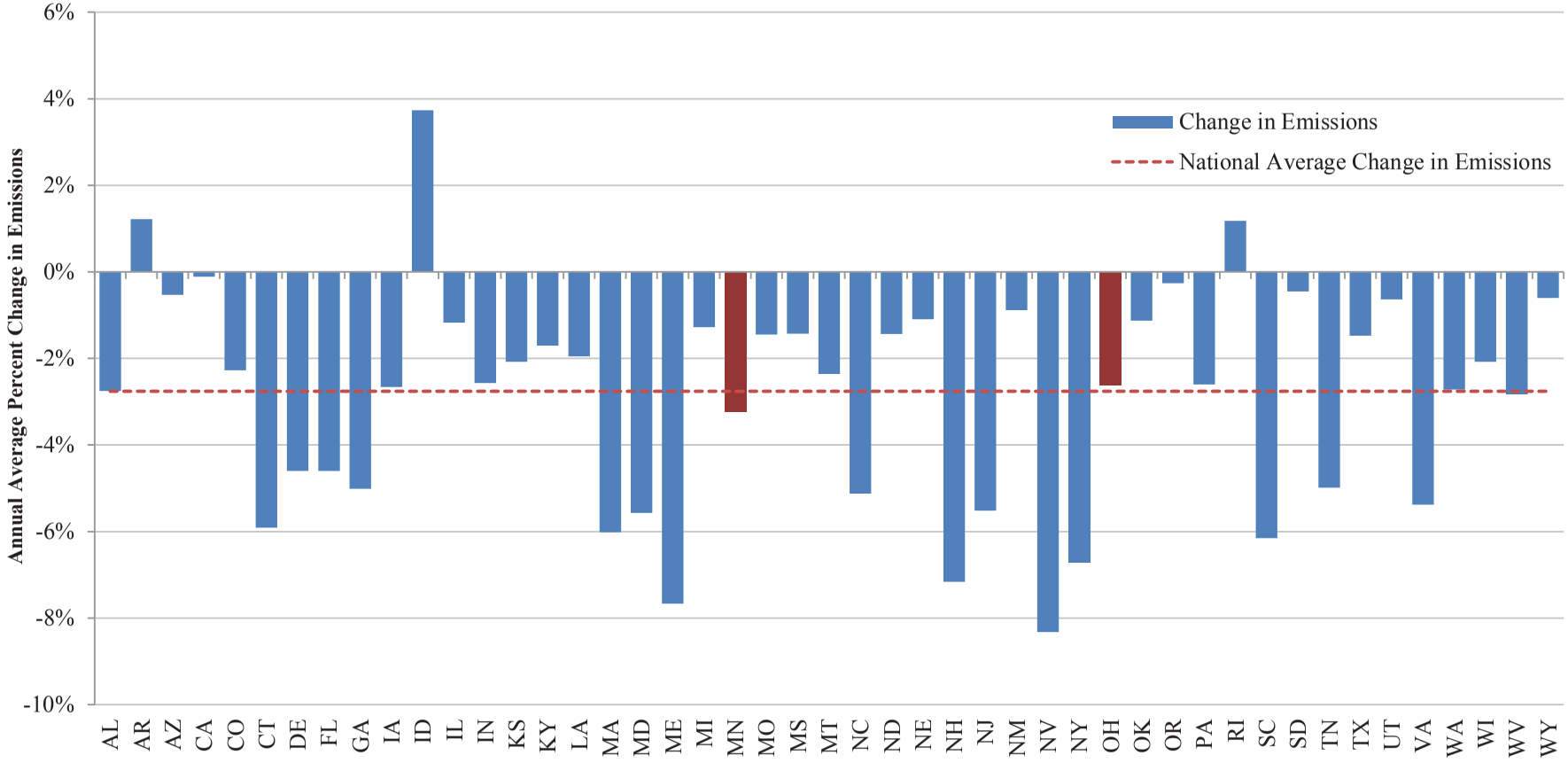
Source: SNL Financial.

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Exhibit 3D

Ohio and Minnesota Provide Two Examples of States with a High Proportion of Commercial and Industrial CustomersThat Have Experienced Significant Reductions in Emissions of CO_2

This figure shows the annual average percent change in emissions from existing affected units over the period 2005-2013 for all states. Ohio and Minnesota are highlighted in red. The dotted line indicates the national average.



Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012.

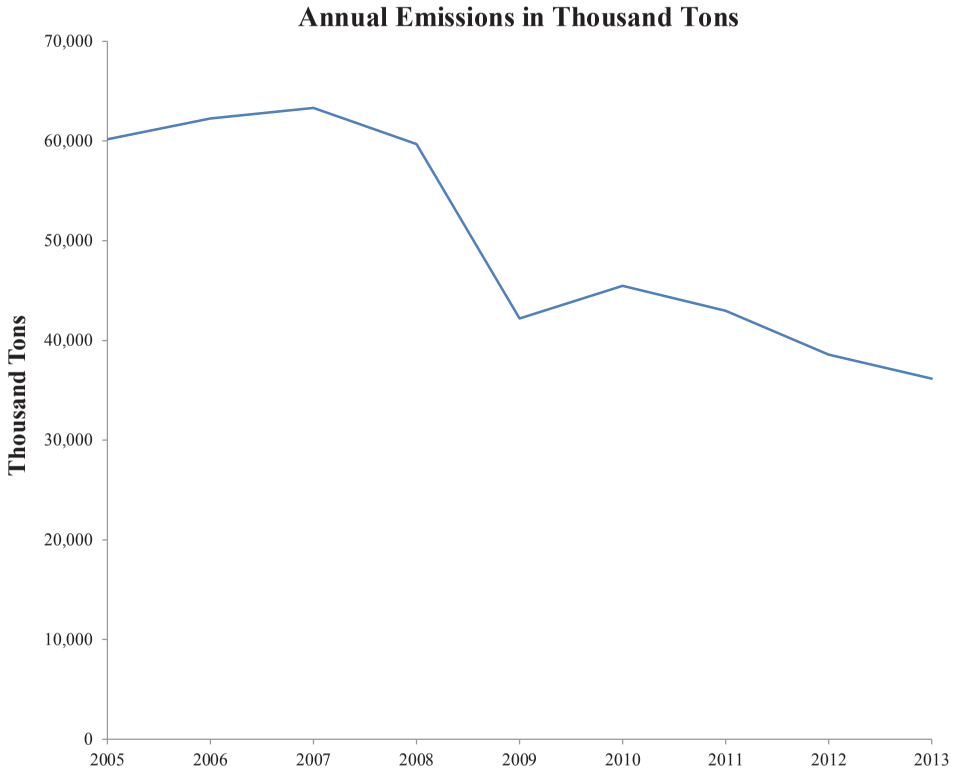
Sources: SNL Financial; EIA-861.

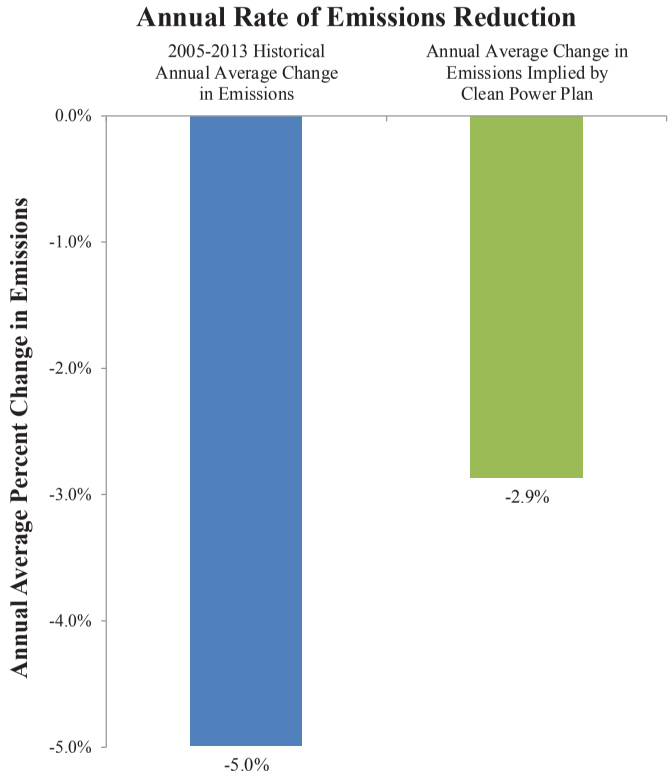
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Exhibit 4A

Tennessee Has Reduced Its Emissions of CO_2 by 40 Percent Since 2005. The Rate of Decline Over this Period Exceeds that Implied Under the Clean Power Plan.

The figure to the left shows total emissions from existing affected units. The figure to the right shows the annual average change in emissions for existing affected units from 2005-2013 compared to the targets implied under the Clean Power Plan.





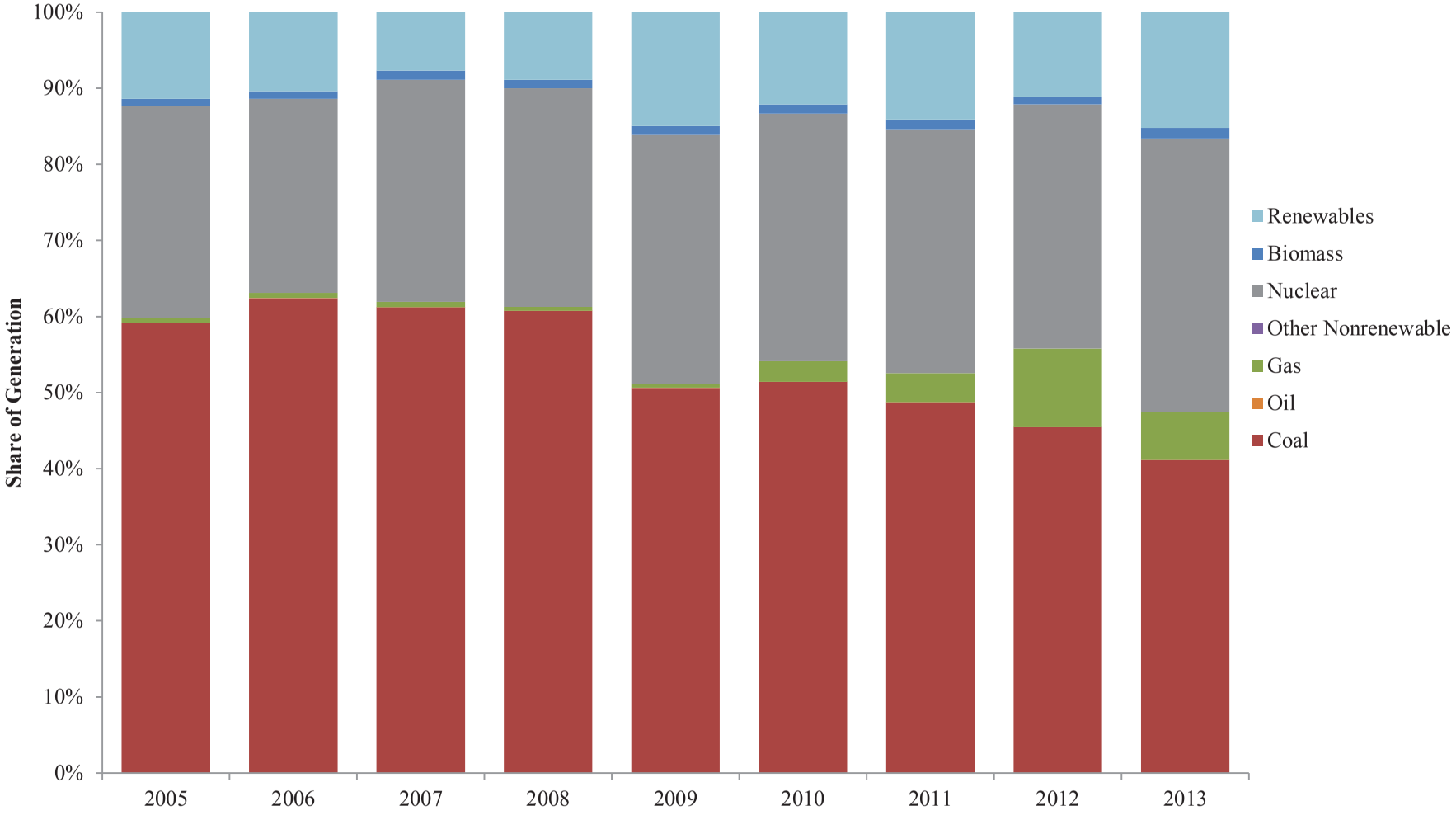
Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [4] The implied annual average percent change in emissions for existing affected units under the Clean Power Plan is determined by calculating the change in emissions from 2019 state emissions to the 2030 Final Mass Goal and dividing by the number of years in the period and expressing this as a percent of start year emissions. We use the EPA's 2012 Adjusted Baseline as a conservative proxy for emissions in 2019.
Source: SNL Financial.

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Exhibit 4B

Tennessee's Emissions Reductions are Largely the Result of Shifting Generation from Coal to Lower-Carbon Sources

This figure shows the relative contribution each form of generation made to Tennessee's fuel mix over the period 2005-2013.



Notes: [1] Net Generation is calculated by summing unit- and plant-level net generation from SNL Financial. [2] Renewables category consists of all renewables assumed to be carbon neutral under the Clean Power Plan, including wind, solar, hydropower, and geothermal. Biomass is shown separately as owners/operators must make a showing about the carbon pollution benefits based on plant-specific characteristics.

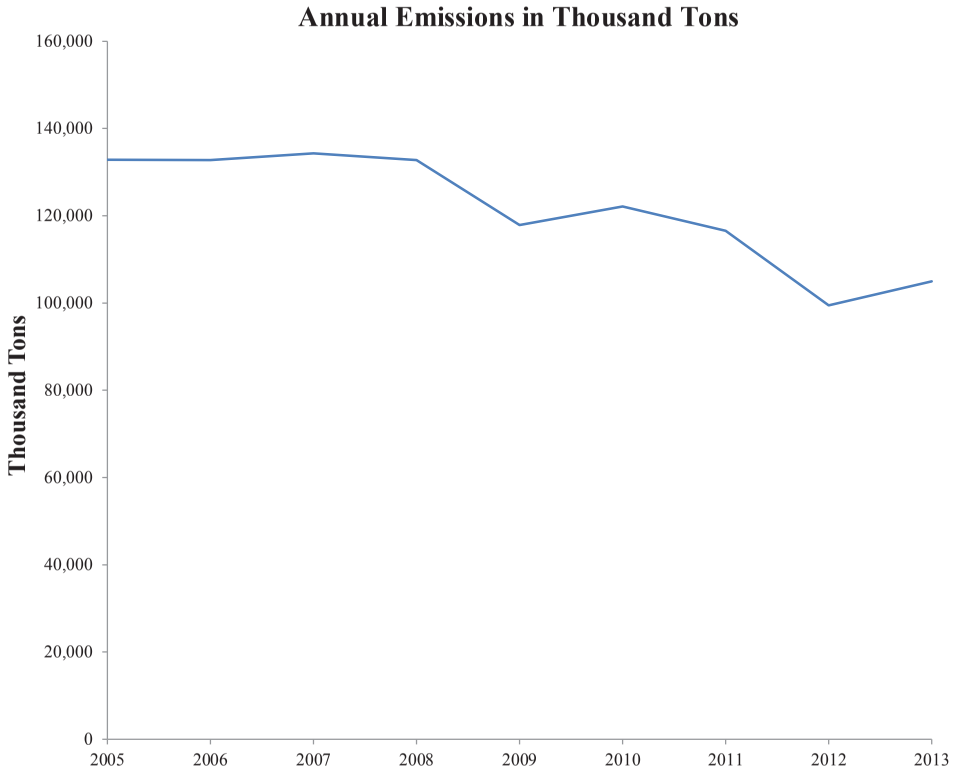
Source: SNL Financial.

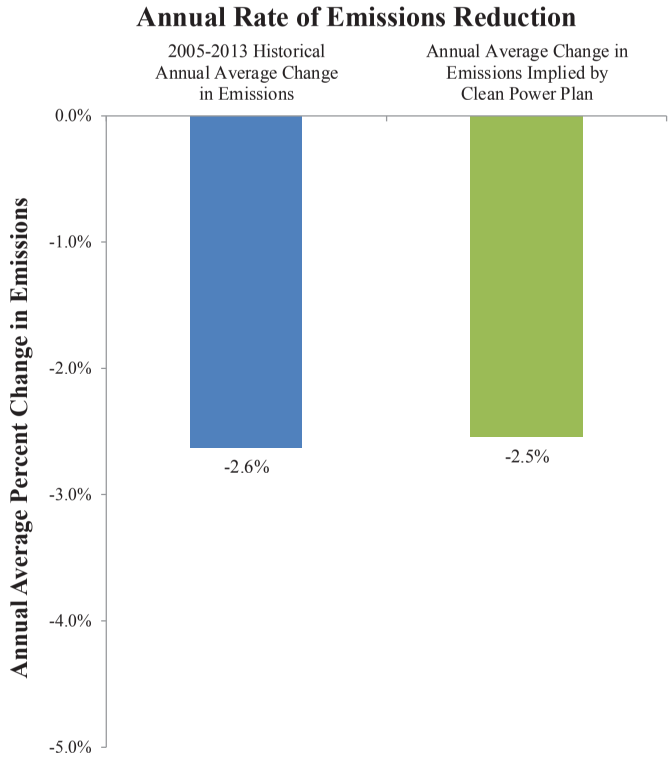
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Exhibit 5A

Ohio Has Reduced Its Emissions of CO_2 by 21 Percent Since 2005. The Rate of Decline Over this Period Slightly Exceeds that Implied Under the Clean Power Plan.

The figure to the left shows total emissions from existing affected units. The figure to the right shows the annual average change in emissions for existing affected units from 2005-2013 compared to the targets implied under the Clean Power Plan.





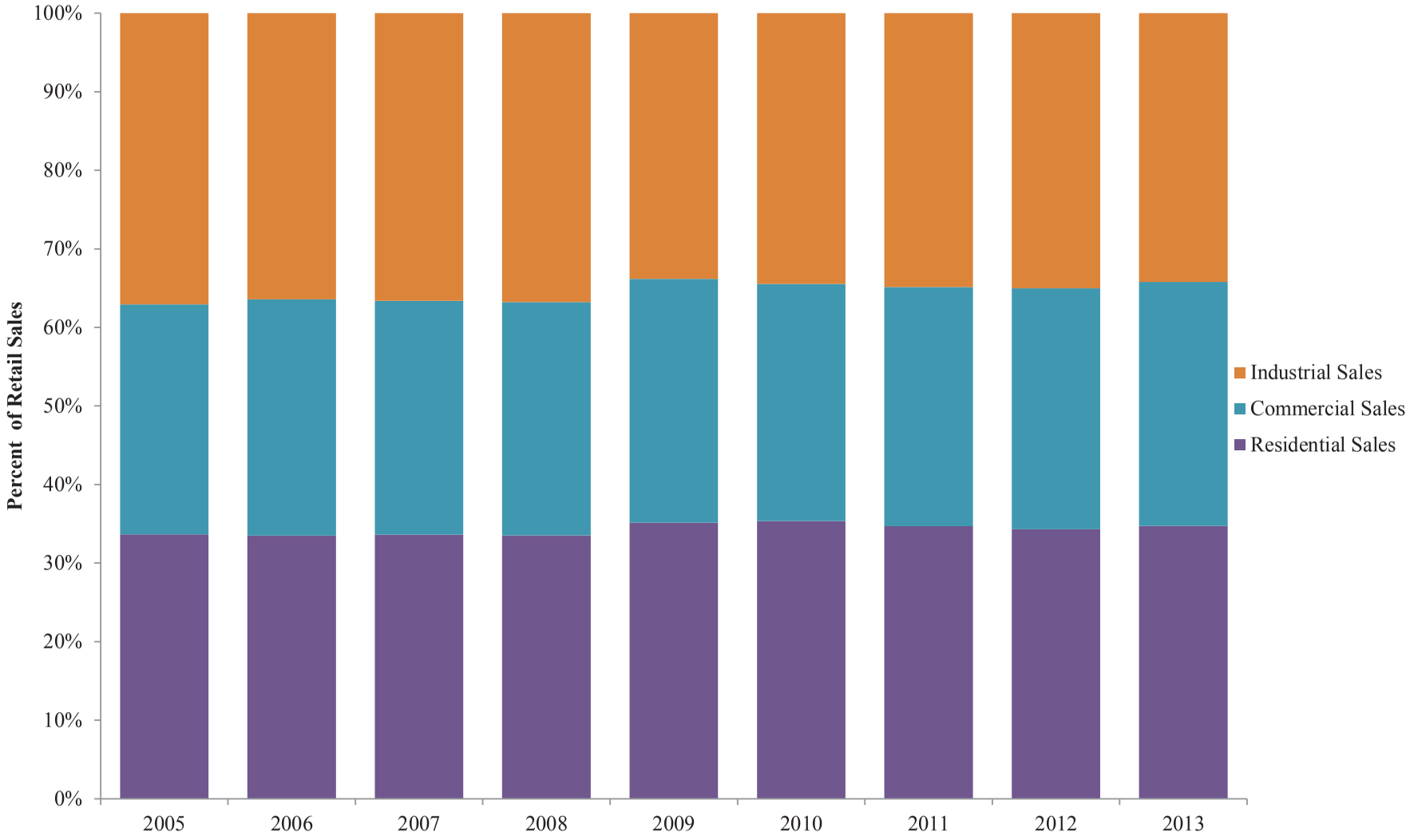
Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [4] The implied annual average percent change in emissions for existing affected units under the Clean Power Plan is determined by calculating the change in emissions from 2019 state emissions to the 2030 Final Mass Goal and dividing by the number of years in the period and expressing this as a percent of start year emissions. We use the EPA's 2012 Adjusted Baseline as a conservative proxy for emissions in 2019.
Source: SNL Financial.

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Exhibit 5B

Industrial Sales Account for Approximately One-Third of Ohio's Total Electricity Sales

This figure shows retail sales by customer class from 2005-2013.



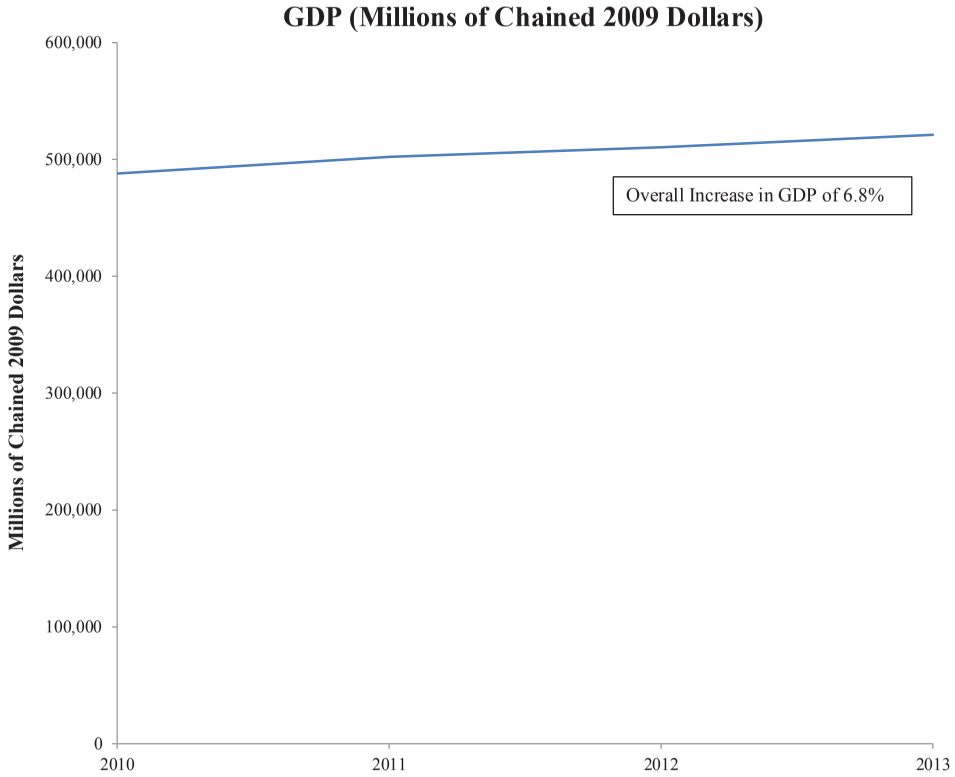
Note: Transportation sales make up less than 0.02 percent of retail sales in Ohio from 2005-2013 and are excluded from this figure.
Source: EIA-861, 2005-2013.

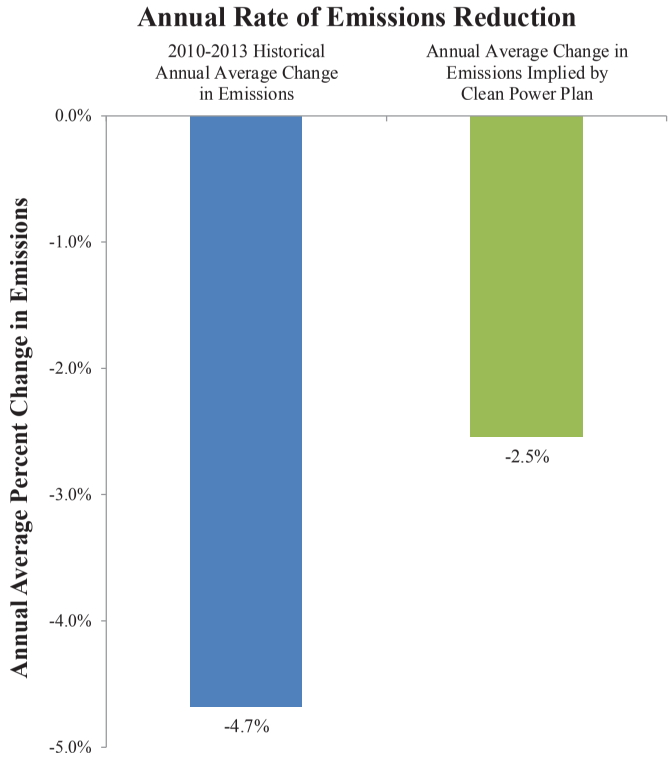
USCA Case #15-1363 Document #1587530 Filed: 12/08/2015 Page 712 of 1227

Exhibit 5C

Ohio Has Reduced Its Emissions of CO_2 by 14 Percent Since 2010, During a Period of Strong Economic Growth. The Rate of Decline Over this Period Exceeds that Implied Under the Clean Power Plan.

The figure to the left shows state GDP from 2010-2013. The figure to the right shows the annual average change in emissions for existing affected units under the same period, compared to the targets implied under the Clean Power Plan.





Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2010-2013 by the number of years in the period and expressing this as a percent of 2010 emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. This exhibit focuses on emissions changes from 2010-2013 to align with a period of strong economic growth in Ohio. [4] The implied annual average percent change in emissions for existing affected units under the Clean Power Plan is determined by calculating the change in emissions from 2019 state emissions to the 2030 Final Mass Goal and dividing by the number of years in the period and expressing this as a percent of start year emissions. We use the EPA's 2012 Adjusted Baseline as a conservative proxy for emissions in 2019.

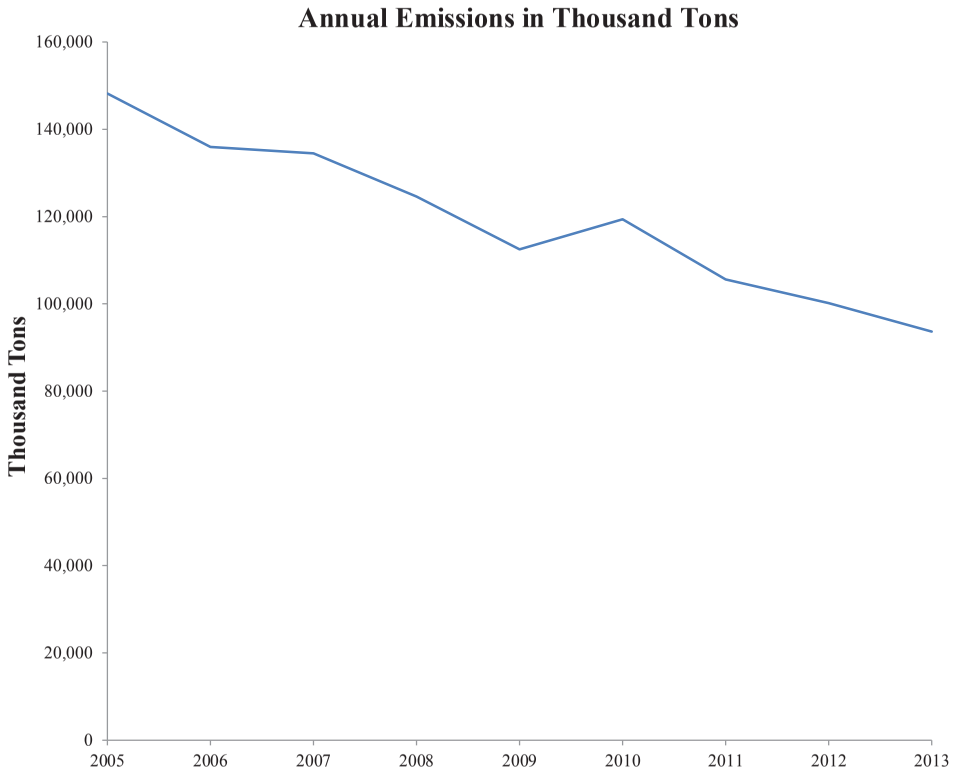
Sources: SNL Financial; Bureau of Economic Analysis.

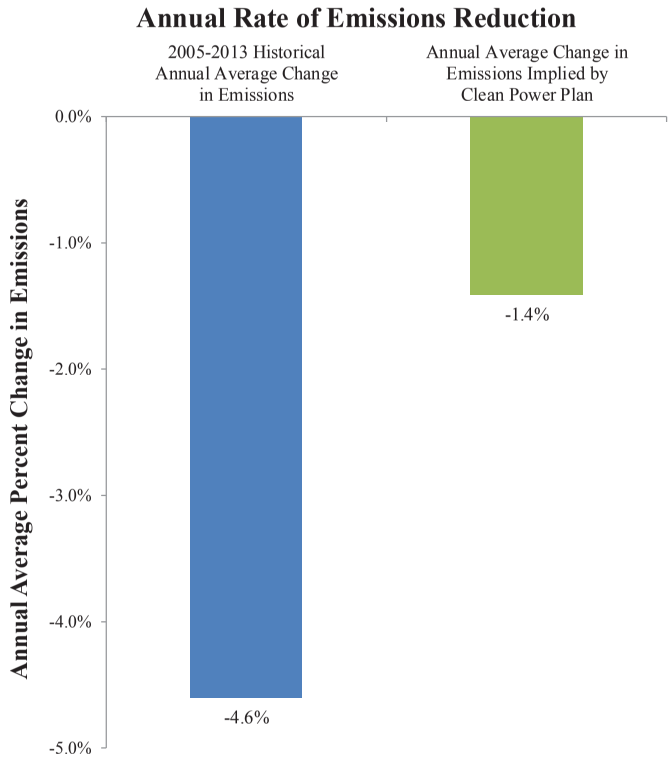
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Exhibit 6A

Florida Has Reduced Its Emissions of CO_2 by 37 Percent Since 2005. The Rate of Decline Over this Period Is More Than Three Times that Implied Under the Clean Power Plan.

The figure to the left shows total emissions from existing affected units. The figure to the right shows the annual average change in emissions for existing affected units from 2005-2013 compared to the targets implied under the Clean Power Plan.





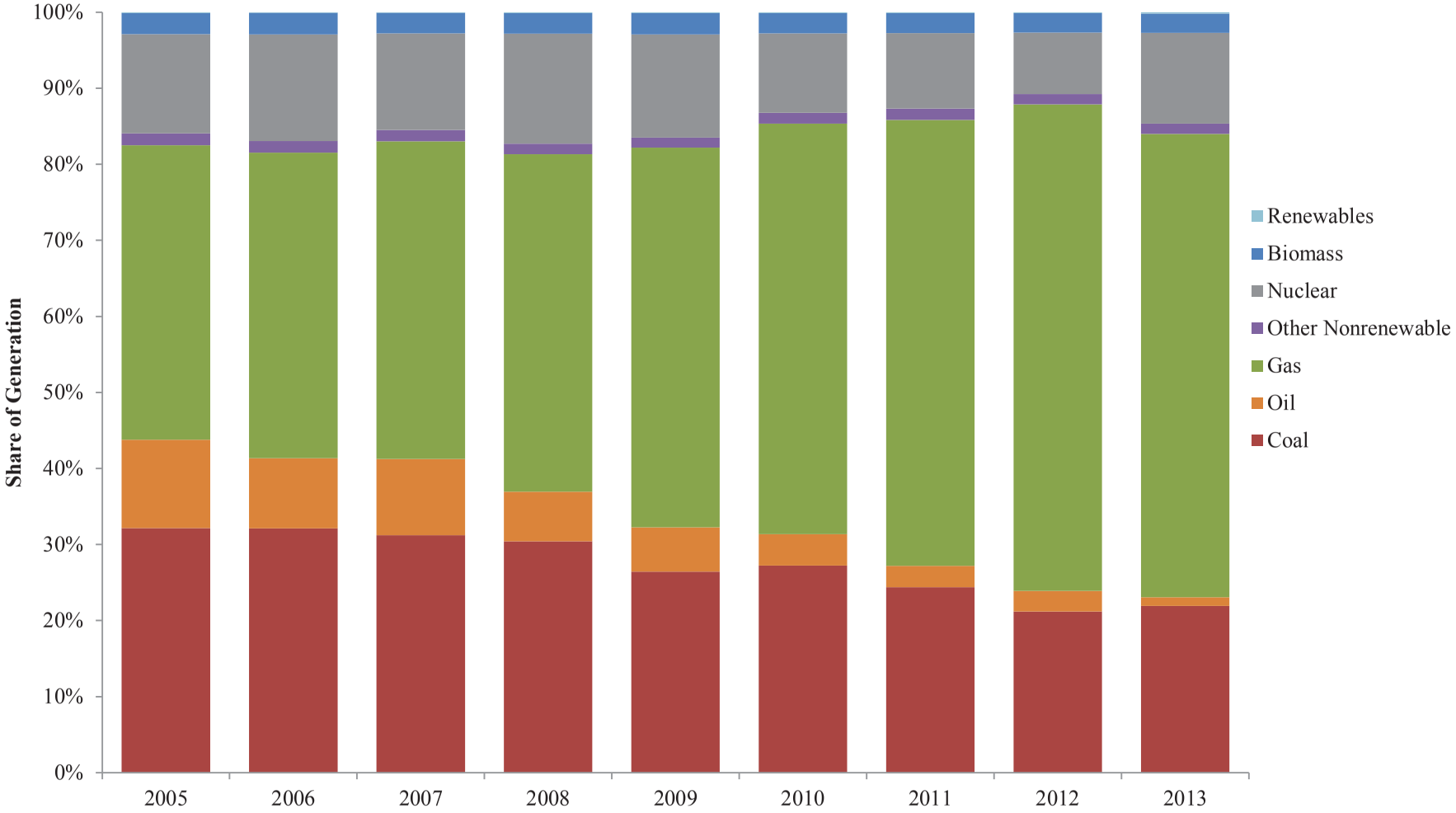
Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [4] The implied annual average percent change in emissions for existing affected units under the Clean Power Plan is determined by calculating the change in emissions from 2019 state emissions to the 2030 Final Mass Goal and dividing by the number of years in the period and expressing this as a percent of start year emissions. We use the EPA's 2012 Adjusted Baseline as a conservative proxy for emissions in 2019.
Source: SNL Financial.

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Exhibit 6B

Florida's Emissions Reductions are Largely the Result of Shifting Generation from Coal and Oil to Natural Gas

This figure shows the relative contribution each form of generation made to Florida's fuel mix over the period 2005-2013.



Notes: [1] Net Generation is calculated by summing unit- and plant-level net generation from SNL Financial. [2] Renewables category consists of all renewables assumed to be carbon neutral under the Clean Power Plan, including wind, solar, hydropower, and geothermal. Biomass is shown separately as owners/operators must make a showing about the carbon pollution benefits based on plant-specific characteristics.

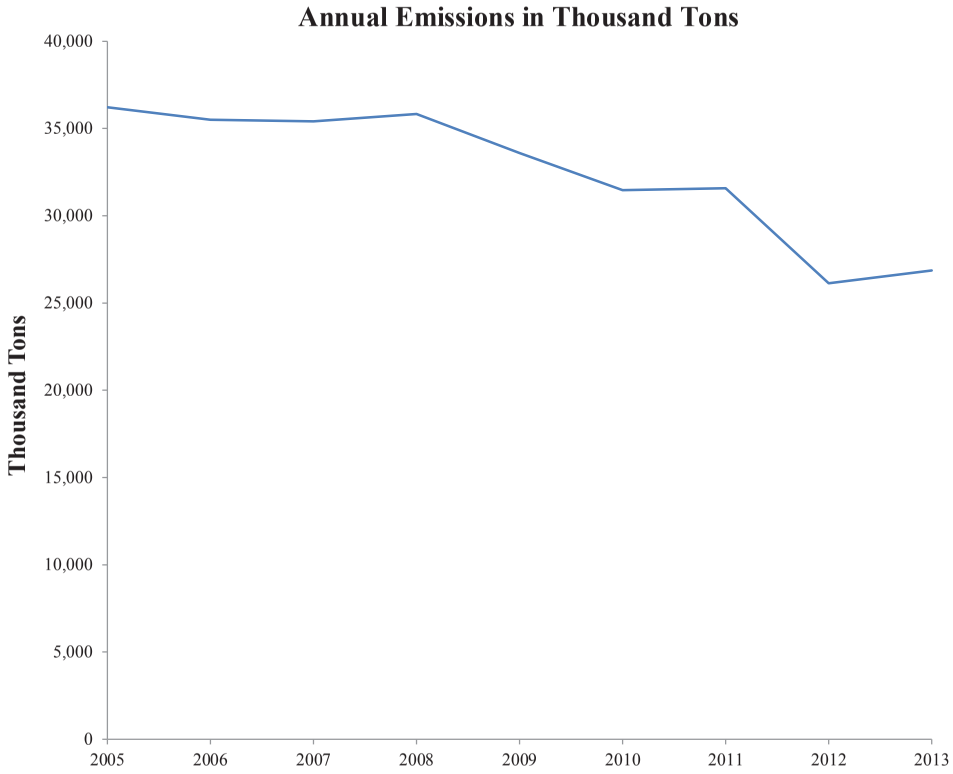
Source: SNL Financial.

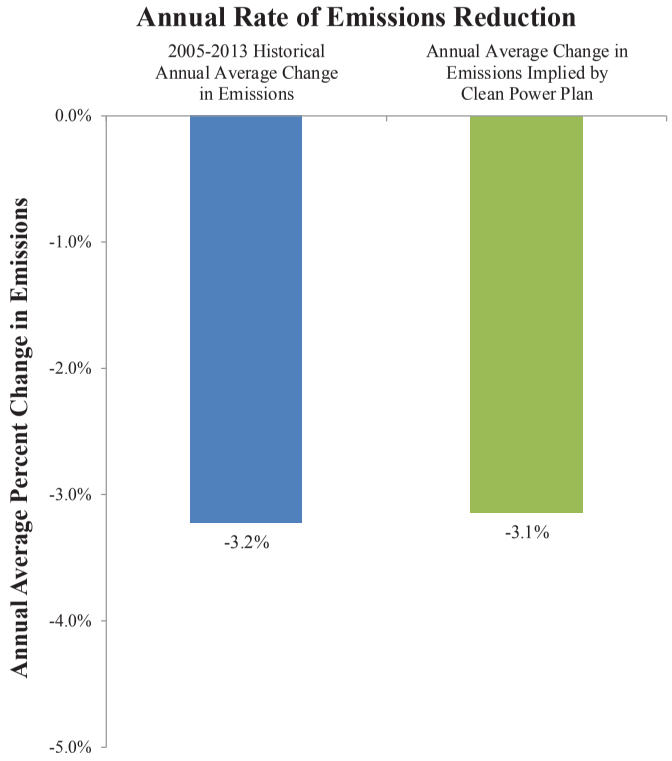
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Exhibit 7A

Minnesota Has Reduced Its Emissions of CO_2 by 26 Percent Since 2005. The Rate of Decline Over this Period Slightly Exceeds that Implied Under the Clean Power Plan.

The figure to the left shows total emissions from existing affected units. The figure to the right shows the annual average change in emissions for existing affected units from 2005-2013 compared to the targets implied under the Clean Power Plan.





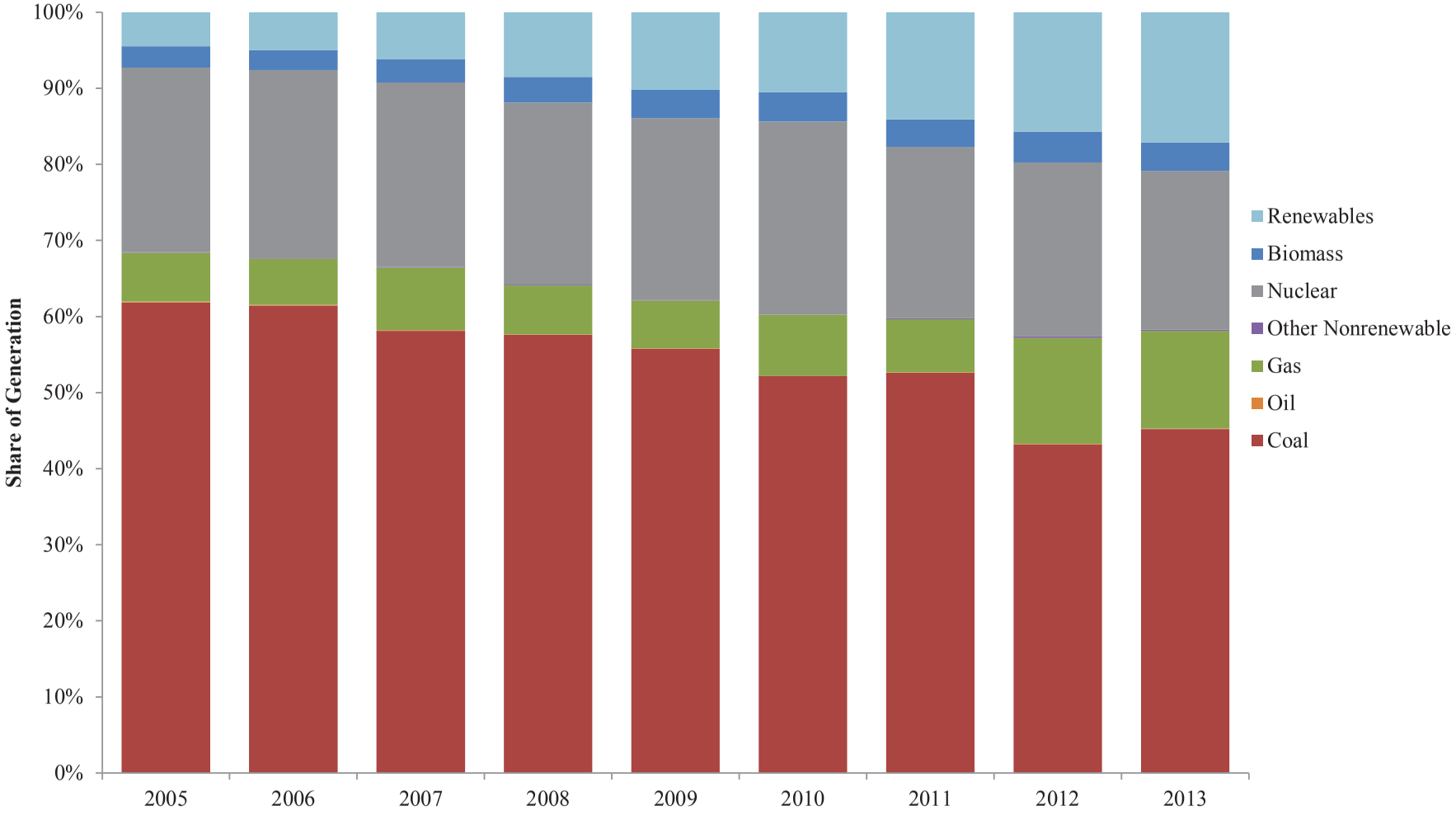
Notes: [1] Historical emissions are calculated by summing emissions from all fossil units online as of 2005 that are determined to be affected electric generating units under the Clean Power Plan. [2] The annual average percent change in historical emissions is calculated by dividing the change in affected emissions from 2005-2013 by the number of years in the period and expressing this as a percent of start year emissions. [3] We focus on affected units online at the beginning of our review period to match the Clean Power Plan, which defines affected existing sources with reference to a specific year, 2012. [4] The implied annual average percent change in emissions for existing affected units under the Clean Power Plan is determined by calculating the change in emissions from 2019 state emissions to the 2030 Final Mass Goal and dividing by the number of years in the period and expressing this as a percent of start year emissions. We use the EPA's 2012 Adjusted Baseline as a conservative proxy for emissions in 2019.
Source: SNL Financial.

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Exhibit 7B

Minnesota's Emissions Reductions are Largely the Result of Shifting Generation from Coal to Renewables

This figure shows the relative contribution each form of generation made to Minnesota's fuel mix over the period 2005-2013.



Notes: [1] Net Generation is calculated by summing unit- and plant-level net generation from SNL Financial. [2] Renewables category consists of all renewables assumed to be carbon neutral under the Clean Power Plan, including wind, solar, hydropower, and geothermal. Biomass is shown separately as owners/operators must make a showing about the carbon pollution benefits based on plant-specific characteristics.

Source: SNL Financial.

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IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

DECLARATION OF MICHAEL C. MacCRACKEN

I, MICHAEL C. MacCRACKEN, declare as follows:

1. I am a scientist who has devoted a career of forty-five years to the study of the causes and impacts of global climate change. After twenty-five years focused on climate modeling studies at the University of California's Lawrence Livermore National Laboratory, I served from 1993 to 2002 as senior scientist on global change within the Office of the U.S. Global Change Research Program, where I facilitated preparation of official U.S. reports on climate change and its impacts, and served the Office leader for four years. Over the past twenty-five years, I have also served in various capacities in the preparation of the First, Second, Third, Fourth, and Fifth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC), and been a member of various other scientific committees and teams that prepared reports on the causes and impacts of climate change.[1]

2. I was asked to analyze claims made by petitioners who have moved to stay the effect of the U.S. Environmental Protection Agency's carbon dioxide (CO_2)

[1] For a more detailed description of my qualifications and experience, see Appendix A to this Declaration.

regulations for existing fossil fuel-fired power plants ("Clean Power Plan" or "Plan") pending this Court's review of the Plan.

3. Petitioners seeking to stay the Clean Power Plan are, at a minimum, seeking to delay implementation of the Plan.[2] I was asked to analyze petitioners' specific claims that a stay and delay of implementation would have no significant consequences for climate change or its impacts.[3]

4. As a climate scientist, I strongly disagree with petitioners' claims.

5. For purposes of this declaration, I assume, as petitioners request or otherwise assume in their stay motions,[4] that a stay of the Clean Power Plan will result in concomitant delays in the Plan's 2022 deadline for beginning CO_2 emissions reductions, in achieving the Plan's interim emissions reduction goals, and in achieving the 32% reduction from 2005 CO_2 emissions levels expected by 2030. For illustrative purposes, I examine the environmental and societal costs of delay in achievement of the Plan's projected emissions reductions.

6. For the reasons I set forth below, initially as a set of Overview points and subsequently in more detail and with citations, it is my expert opinion that by delaying necessary, time-sensitive reductions in CO_2 emissions, a stay of the Clean Power Plan would have significant and negative effects on the global environment

[2] *See, e.g.*, Basin Elec. Power Coop.'s Mot. to Stay at 1.
[3] *See, e.g.*, Coal Industry Mot. for Stay at 19–20; Utility and Allied Petitioners Mot. for Stay at 20.
[4] *See, e.g.*, Basin Elec. Power Coop.'s Mot. to Stay at 1 (asking the Court to "extend all compliance dates by the number of days between publication of the Rule and a final decision" in the case); Chamber of Commerce Mot. for Stay at 20 (assuming "implementation would be delayed by a stay"); Coal Industry Mot. for Stay at 19–20 (considering public interest factor by looking at Plan's CO_2 emissions reductions expected by 2030). I take no position on whether a stay of the Clean Power Plan should or would in fact result in a delay of the Clean Power Plan's deadlines or the power industries' compliance with the interim (2022) and final (2030) goals, but assume that it would for the purposes of responding to petitioners' arguments that rely on the same assumption.

and societal well-being in two compounding ways. First, the delay in reducing U.S. power plant CO_2 emissions would itself have significant, tangible, and quantifiable negative impacts. Second, by undermining confidence in U.S. adherence to its commitments made in international climate change negotiations, the delay would likely undermine the implementation of commitments made by other countries, magnifying the consequences of the U.S. delay many times over.

OVERVIEW

7. **The current rate of global CO_2 emissions will result in severe environmental and societal consequences.** There is a very strong international consensus that the changes in climate, sea level, and ocean chemistry caused by emissions of CO_2 and other greenhouse gases pose an increasing threat to multiple environmental systems that affect human health and well-being and the stability of local, national, and international economies and societies. To avoid the worst impacts of climate change, international leaders have set a goal of preventing the global average temperature from increasing by more than 2ºC over its pre-industrial level. To have a reasonable likelihood of achieving this goal, cumulative future global CO_2 emissions cannot exceed ~900 billion metric tons. At the present rate of global emissions, this total global allowance will be used up in ~25 years. *See infra* ¶¶ 21–24.

8. **Changes in climate resulting from human-caused emissions of CO_2 are already significant and, without sharp emissions reductions, much greater changes and associated damages lie ahead.** Human-caused emissions of CO_2 have been the primary cause of increased seasonal- and annual-average temperatures since the middle of the last century and of acidification of the ocean

over the past several decades. The changes in the amount and pattern of warming, along with associated changes in atmospheric water vapor loading, contribute to increased instances of extreme weather, melting and retreat of snow cover and ice sheets, sea-level rise, and a poleward shift of storm tracks that is leaving the southern states more arid. Ideal ranges for terrestrial and marine species are shifting rapidly and ecosystems are being disrupted. Productivity of farms and forests is increasingly threatened and coastal areas are increasingly subjected to rising sea levels. Petitioners fail to acknowledge the full range of trends and impacts. *See infra* ¶¶ 14–20.

9. **As the global average temperature increases, so do the risks of nonlinear and irreversible environmental and societal consequences.** Petitioners' assertions that small changes in global average temperature are insignificant ignore that the risk of nonlinear and irreversible consequences grows as warming continues. Each successive decade since the 1970s has been warmer than the last, with the 2010s being the warmest of all. While the decade-to-decade increase in the global average temperature has so far been relatively steady, some processes governing climate and its associated impacts are nonlinear and can even change relatively suddenly. For example, the limited increase in global average temperature so far had led to a rapid increase in the rate at which the Greenland and Antarctic ice sheets are melting and contributing to sea-level rise, and to initial thawing of vast areas of permafrost and release of carbon trapped in soils, which in turn will contribute to additional warming. *See infra* ¶¶ 25–28.

10. **Because U.S. power plants are a major contributor to national and global CO_2 emissions, power plants must begin cutting emissions as soon and**

deeply as possible. The United States is responsible for approximately 16% of annual global CO_2 emissions (based on 2013 estimated emissions). Electricity generation is the largest source of CO_2 emissions both globally and in the United States. Sharply and rapidly reducing CO_2 emissions from power plants both globally and in the United States must therefore be an essential component of any effort to curb climate disruption and its most severe environmental and societal consequences. *See infra* ¶¶ 29–31.

11. **Petitioners use metrics that minimize and obscure the true climate effects of delaying implementation of the Clean Power Plan.** Petitioners' reliance on the percentage change in the global CO_2 concentration and in annual CO_2 emissions due to the Clean Power Plan ignores the fact that the atmospheric CO_2 concentration is already at its highest level in millions of years, and that U.S. power plants are one of the largest single sources of emissions in the world. Petitioners' estimates of avoided short-term increases in global average temperature and sea-level rise as a result of the Clean Power Plan are fundamentally flawed because they ignore the persistency and long-term effects of atmospheric CO_2. Petitioners accordingly systematically underestimate the environmental and societal effects of delaying the Clean Power Plan's emissions reductions. *See infra* ¶¶ 32–38.

12. **Delaying the Clean Power Plan's emissions reductions would have quantifiable economic costs totaling many billions of dollars.** U.S. agencies have developed and continue to refine a metric known as the "Social Cost of Carbon" to estimate the quantifiable global economic consequences of emitting each additional metric ton of CO_2. The social cost of carbon also is a measure of the quantifiable

global economic benefits of avoiding each additional metric ton of CO_2 emissions. The U.S. government estimates the current social cost of carbon is $40 per ton of CO_2 emissions, and that the social cost of carbon will increase to $56 per ton by 2030. These estimates, large as they are, are widely criticized for being too low. Even applying the U.S. government's conservative values for the social cost of carbon, a one-year delay in implementing the Clean Power Plan would result in a monetizable global cost of more than $11 billion, with much more unaccounted for in environmental harm and risk. Petitioners entirely ignore these costs of delaying CO_2 emissions reductions. *See infra* ¶¶ 39–45.

13. **A stay of the Clean Power Plan could have negative effects on implementation of international climate commitments.** Petitioners say nothing about the impacts a stay would have on implementation of international climate commitments. Over 150 nations have made initial commitments to reduce global annual CO_2 emissions by 3.6 billion metric tons from projected levels by 2030 (an amount equivalent to about 10% of current emissions). As a major historical and ongoing contributor to CO_2 emissions, the United States must necessarily be a critical player in any international action to limit climate change. A stay of the Clean Power Plan could thus undermine the international momentum for emissions reductions and slow or even derail compliance with those commitments. Even one year of delay from current international commitments would result in global social costs of over $200 billion in 2030, using the 2030 value of the social cost of carbon. *See infra* ¶¶ 46–54.

SUPPORTING VIEWS AND ANALYSES

Finding I: Changes in climate resulting from human-caused emissions of CO_2 are already significant and, without sharp emissions reductions, much greater changes and associated damages lie ahead.

14. Petitioners fail to acknowledge that we are already experiencing human-induced changes in the climate and impacts that are resulting from these changes. Petitioners also fail to acknowledge that the effects and impacts will markedly increase unless there are substantial reductions in global CO_2 emissions.

15. Assembled temperature observations indicate that the global average temperature has increased 0.8ºC (almost 1.5ºF) since the mid-19th century, and is continuing to trend higher. Most of this increase has occurred since the end of World War II, along with most of the increase in the atmospheric CO_2 concentration. Since the 1970s, each decade has been noticeably warmer than the previous one, with the 2010s being the warmest of all. The increase in the global average temperature has been relatively steady, and statistically significant.[5]

16. Careful analysis of the extensive set of observations makes clear that the continuing increases in the atmospheric concentrations of CO_2 and other greenhouse gases are the only viable explanation for the temporal and spatial patterns of the ongoing changes in climate and increase in global average temperature. There is no similar evidence suggesting that any plausible changes in

[5] *See* Thomas R. Karl et al., *Possible Artifacts of Data Biases in the Recent Global Surface Warming Hiatus*, Sci., June 26, 2015, at 1469, 1469–72.

natural factors could be causing the observed changes in global average temperature since the beginning of the Industrial Revolution, and particularly since the 1970s.[6]

17. Comprehensive analyses indicate that global CO_2 emissions from combustion of coal, petroleum, and natural gas have caused about three-quarters of the increase in the atmospheric CO_2 concentration since the start of the Industrial Revolution (*i.e.*, three-quarters of the increase from about 280 to just over 400 parts per million by volume[7]). Changes in land use and land cover, *e.g.*, deforestation and agriculture, make up most of the remainder of the human-driven contribution to the increase in the atmospheric CO_2 concentration.[8] This greater-than-40% increase in the CO_2 concentration has been the primary factor leading to the 0.8ºC increase in the global average temperature since the mid-19th century, to levels that, based on ice core evidence, have not occurred in at least 800,000 years.[9]

18. While the ocean and terrestrial biosphere relatively rapidly take up around half of emitted CO_2, the remainder increases the long-term atmospheric CO_2 concentration. A significant share of the increase in the atmospheric CO_2 concentration persists for centuries, with some of the increase persisting for many millennia. Because of the large annual amount of CO_2 emissions and the very long

[6] The global average temperature responds to all natural and human-induced warming and cooling influences together. While the non-CO_2 factors can sometimes offset the warming influence of CO_2 over the short-term, the cumulative effect of the rise in the atmospheric concentration of CO_2 has become the primary factor that has pushed the global average temperature up to its unusually high present value. *See* IPCC, *Climate Change 2013: The Physical Science Basis* 386 (T. Stocker et al. eds. 2013).
[7] This concentration is higher than during the glacial-interglacial swings of the last million-plus years.
[8] *Global Carbon Budget*, Global Carbon Project, http://www.globalcarbonproject.org/carbonbudget/14/hl-full.htm.
[9] The extraction, processing, transport, and combustion of fossil fuels also result in emissions of methane (*i.e.*, unburned natural gas), soot (partially burned fuels), and the mix of hydrocarbons and nitrogen oxides that lead to the generation of tropospheric ozone (*i.e.*, photochemical smog). Because these emissions also contribute to global warming, consideration of only CO_2 emissions resulting from burning of fossil fuels actually understates their contribution to global climate change.

persistence of the increased CO_2 concentration, CO_2 emissions have become the primary factor causing long-term global warming, and so merit special attention in curbing climate change.[10]

19. Economists and energy sector experts have constructed a number of plausible scenarios for how the global energy sector and CO_2 emissions will evolve through the 21st century. When used to drive climate simulations, the different CO_2 emission scenarios project a broad range of potential future climate outcomes. These scenarios range from assuming a business-as-usual approach, involving continued primary reliance on fossil fuels as a source of electric power, to assuming a relatively rapid transition to energy sources, such as nuclear and renewables, that do not emit CO_2. The business-as-usual approach is projected to increase the global average temperature at the end of the 21st century to ~4 to 5ºC above its pre-industrial value (with the global average temperature rising further during the 22nd century); such an increase would lead to very dire consequences.[11] In contrast, assuming a relatively rapid transition to energy sources that do not emit CO_2 and other greenhouse gases, the increase in the global average temperature in the 21st century could be limited to ~1.5 to 2ºC above its pre-industrial level.[12] Until

[10] As EPA has explained, "[b]ecause CO_2 in the atmosphere is long-lived, it can effectively lock the Earth and future generations into a range of impacts, some of which could become very severe. Therefore, emission reduction choices made today matter in determining impacts experienced not just over the next few decades, but in the coming centuries and millennia." *See* 80 Fed. Reg. at 64,682 (quoting Nat'l Research Council, *Climate Stabilization Targets* 3 (2011)). While other pollutants emitted from fossil fuel-fired power plants are important to consider in limiting climate change over the next several decades, it is very critical to begin early to limit the long-term climatic influence of CO_2 emissions. I therefore do not consider the roles of non-CO_2 pollutants in this declaration.

[11] The World Bank, *Turn Down the Heat: Confronting the New Climate Normal* at xviii–xxxii (2014), *available at* https://openknowledge.worldbank.org/handle/10986/20595; The World Bank, *Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience* at xv–xvi (2013), *available at* https://openknowledge.worldbank.org/handle/10986/14000.

[12] *See* IPCC, *Climate Change 2014: Synthesis Report* 60 tbl. 2.1 (The Core Writing Team et al. eds. 2014).

recently, governments have been moving slowly to reduce emissions of CO_2 and other greenhouse gases, placing future climatic conditions on a path much closer to the former than the latter outcome.[13] The pace of action to reduce emissions will ramp up as countries implement their national commitments made leading up to the December 2015 Paris climate conference. *See infra* ¶ 50.

20. Environmental and societal effects of continued emissions are not limited to increases in global average temperature. The effects also include changes in weather, the most significant including: an increased frequency and intensity of severe weather and precipitation events; more intense evaporation, resulting in reduced soil moisture, negative impacts to crop production, and increased frequency and severity of wildfires; shifts in timing and locations of storm tracks that affect the timing and quantity of river flows, reducing supplies that can be provided by long-established water resource systems; melting of mountain glaciers and ice sheets that is adding to the sea-level rise caused as the oceans warm and expand (threatening low-lying areas); and a poleward shift of storm tracks that is making the southern United States more arid. This rapid alteration of the biosphere threatens to degrade food security, displace human populations, and outpace the ability of flora and fauna to shift to new regions and continue to supply important ecological services.[14]

[13] *See, e.g.*, *Climate Scoreboard*, Climate Interactive, https://www.climateinteractive.org/tools/scoreboard (accessed Nov. 28, 2015) (predicting that, even accounting for fulfillment of national CO_2 emissions reduction commitments related to the Paris Conference of the Parties, the global average temperature will reach 3.5ºC above pre-industrial averages by 2100).

[14] *See* IPCC, *Climate Change 2014*: *Impacts, Adaptation, and Vulnerability* 14–20 (Christopher B. Field et al. eds. 2014).

21. Concerned about the prospect of such significant societal and environmental impacts, the international community adopted the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, with an "ultimate objective . . . to achieve . . . stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[15] The United States is a party to the UNFCCC.[16]

22. To meet the UNFCCC's "ultimate objective" (including preventing the worst nonlinear and irreversible impacts, discussed *infra* ¶¶ 25–28), international leaders committed in 2009 to limiting the increase in the global average temperature to less than 2ºC above its pre-industrial value.[17]

23. Avoiding the very disruptive impacts that would very likely result from exceeding the 2ºC limit will require reducing emissions well below the emissions path reflected in current policies. In its Fifth Assessment Report (2015), the IPCC concluded that "[e]nsuring CO_2-induced warming remains less than 2ºC [will require] cumulative CO_2 emissions from all anthropogenic sources to remain below about 3650 [billion tons of CO_2], over half of which were already emitted by 2011."[18] Accounting for the warming effects of other greenhouse gases and for emissions of

[15] U.N. Framework Convention on Climate Change art. 2, opened for signature May 9, 1992, S. Treaty Doc No. 102-38,1771 U.N.T.S. 107.
[16] The U.S. Senate ratified the UNFCCC on October 15, 1992.
[17] *See* Copenhagen Accord, 2/CP. 15, U.N. Doc. FCCC/CP/2009/11/Add.1, at 5–7 (Dec. 18, 2009). Nations at the most risk of the impacts of climate change, including especially low-lying island nations, argued that the objective should have been to limit the maximum increase in global average temperature to no more than 1.5ºC. Considering the fact that Greenland and Antarctic ice sheets are already losing mass with to-date warming of 0.8ºC above pre-industrial levels, some scientific experts predict that to-date warming is likely to lead, over centuries to millennia, to sea levels as much as 10 meters higher than at present. For purposes of this declaration, in accord with international negotiators, I will use the 2ºC limit, even though this value is well above what I as a climate scientist would recommend as sound policy.
[18] *See* IPCC, *Climate Change 2014: Synthesis Report*, *supra* note 12, at 63.

CO_2 due to changes in land cover and use, the IPCC concluded that the limit for post-2011 CO_2 emissions is roughly 1000 billion metric tons.[19] With global CO_2 emissions from the combustion of fossil fuels currently totaling around 36 billion tons per year,[20] the limit for post-2011 CO_2 emissions will very likely be surpassed in the next two and a half decades if emissions rates are not reduced.[21]

24. Considering the current level of global CO_2 emissions, and the limit on emissions associated with not surpassing a 2ºC increase in global average temperature, emissions reductions will need to begin very soon in order to meet the international goal. The sooner emissions reductions begin, the longer—but inevitably still quite limited—the time over which emissions could be spread.[22] Conversely, any delay in emissions reductions will require a significantly more aggressive effort to reduce emissions in the future in order to not surpass the 2ºC limit, which will raise costs and likely lead to a higher value of stranded fossil-fuel assets.

Finding II: As the global average temperature increases, so do the risks of nonlinear and irreversible environmental and societal consequences.

25. Petitioners' assertions that small changes in global average temperature are insignificant[23] ignore the increased risks of nonlinear and irreversible consequences as warming continues. Quoting the IPCC, while "[t]he precise levels

[19] *See* IPCC, *Climate Change 2014: Synthesis Report*, *supra* note 12, at 63.
[20] *Global Carbon Budget*, *supra* note 8.
[21] The three years of CO_2 emissions since 2011 leave only about 900 billion tons to go; dividing by the current CO_2 emissions rate of around 36 billion metric tons per year would allow only twenty-five more years of emissions.
[22] By also sharply reducing emissions of non-CO_2 warming agents (particularly methane, black carbon, the precursors of tropospheric ozone, and new refrigerants), there is the opportunity to offset the warming influence of the reduced emissions of sulfur dioxide as a result of decreased coal combustion. Such actions together could slow the rate of warming over the next few decades, which would allow more time to prepare for the projected climate consequences and related impacts of CO_2 emissions.
[23] *See, e.g.*, Coal Industry Mot. for Stay at 20.

of climate change sufficient to trigger tipping points (thresholds for abrupt and irreversible change) remain uncertain, . . . the risk associated with crossing multiple tipping points in the [Earth] system or in interlinked human and natural systems increases with rising temperature."[24]

26. The last two decades have seen increasing indications that numerous related measures of climate disruption are occurring more rapidly than initially projected. For example, amplified warming of the Arctic is melting back sea ice more rapidly than projected. Together with overall oceanic warming, the west-to-east movement of weather systems in the Northern Hemisphere is slowing, contributing in some regions to longer and stronger periods of drought-inducing evaporation and, in other regions, to heavier and more persistent precipitation and flooding. Increased occurrence of record maximum temperatures and prolonged periods of hot days are also contributing to the more intense and frequent extreme conditions.[25] These daily and seasonal patterns of the weather are becoming increasingly different from those to which modern society, indigenous peoples, and the global biosphere have become accustomed over past centuries and millennia.[26]

27. The increases in global average temperature are also increasing the likelihood of nonlinear changes and irreversible consequences. Both the Greenland and Antarctic ice sheets have begun to melt, roughly doubling the average rate of sea-level rise otherwise caused by the warming during the 20th century. The amplified

[24] *See* IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, *supra* note 14, at 17.
[25] As a measure of how significant such changes can be, observations going back to the 1950s indicate that the likelihood of extremely warm summers over Northern Hemisphere land areas has increased from about 0.1% in the mid-20th century to about 10% in recent decades. *See* J. Hansen et al., *Perception of Climate Change*, 109 Proc. Nat'l Acad. Sci. 14726 (2012).
[26] *See* IPCC, *Climate Change 2013: The Physical Science Basis*, *supra* note 6, at 386.

warming in high latitudes has also initiated the thawing of permafrost in the Northern Hemisphere's polar regions, leading to increasing transfer into the atmosphere of the carbon (as CO_2 or, more significantly, methane) that has long been held captive in these frozen, peat-rich soils. Such a large release of CO_2 from thawed permafrost would significantly and irreversibly augment humankind's influence on the climate, and any contribution of such emissions should be considered as both an environmental and economic impact of a delay in implementation of the emissions reductions under the Clean Power Plan.[27]

28. Increased global average temperature and associated changes in the climate are already causing poleward and upward shifts in the ideal ranges of terrestrial plants and animals, leading to reductions and even loss of species as the Arctic coastline and the tops of mountains create barriers to further migration. Because the shifts in range of each species are different, productive ecosystems are being seriously disrupted. In the oceans, while climate change forces marine species poleward to find their preferred temperatures, the increasing atmospheric CO_2 concentration forces more CO_2 into the ocean, reducing ocean pH and creating conditions less chemically and energetically suitable for formation of coral, skeletons, and other carbonate materials important to the marine biosphere.[28]

[27] *See* IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, *supra* note 14, at 12, 15.
[28] *See* IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, *supra* note 14, at 14–15.

Finding III: Because U.S. power plants are a major contributor to current national and global CO_2 emissions, they must begin cutting emissions as soon and deeply as possible.

29. The United States is responsible for about 27% of total global emissions of CO_2 since 1850.[29] As of 2012, annual U.S. emissions totaled ~5.5 billion tons of CO_2 per year, or just over 16% of the annual global total,[30] while the U.S. population constitutes only 4.5% of global population.

30. Electricity production is the largest source of both global and domestic CO_2 emissions. As the single largest source category of global CO_2 emissions,[31] reductions in emissions from electricity production must be an essential component of any effort to avoid surpassing the 2ºC limit.

31. The contribution of the U.S. power plants to global CO_2 emissions is significant. In 2013, power plants accounted for ~40% of U.S. CO_2 emissions, significantly exceeding the emissions from transportation (~34%), industry (~16%), and residential and commercial sources (~10%).[32] Electricity generation is therefore the largest source of CO_2 emissions in a country that itself is the second largest CO_2 emitter in the world.[33] Sharp reductions of CO_2 emissions from the U.S. power sector will accordingly need to be an essential component of any global effort to avoid surpassing the 2ºC limit. It is therefore vital that emissions reductions for U.S. power

[29] Mengpin Ge et al., World Res. Inst., *6 Graphs Explain the World's Top 10 Emitters* (Nov. 24, 2014), http://www.wri.org/blog/2014/11/6-graphs-explain-world's-top-10-emitters.
[30] *International Energy Statistics*, U.S. Energy Information Admin., https://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm? (accessed November 24, 2015).
[31] *See* Int'l Energy Admin., *CO_2 Emissions from Fossil Fuel Combustion: Highlights* 10 (2014 ed.).
[32] *See* U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*, EPA 430-R-15-004, ES-11 to -12 (2015), *available at* http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf.
[33] *See CO, Time Series 1990-2013 Per Region/Country*, Emission Database for Global Atmospheric Research, http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2013&sort=des9.

plants begin as early as possible to avoid significant climate disruption and the most severe environmental and societal consequences of climate change.

Finding IV. Petitioners use metrics that minimize and obscure the true climate effects of delaying implementation of the Clean Power Plan.

32. Petitioners' stay motions use metrics to characterize the climate effects of the Clean Power Plan that tend to minimize and obscure the importance and significance of the effects of delaying implementation of the Plan's emissions reductions.

33. Some petitioners claim that the Clean Power Plan will not affect climate change because emissions reductions in the Plan represent less than 1% of global CO_2 emitted today.[34] Such claims fail to recognize that the atmospheric CO_2 concentration is at its highest level since well before the glacial-interglacial cycling of the climate that has dominated the last millions of years—and that the CO_2 concentration is still rising as a result of overall global emissions. The danger associated with any further addition to this elevated CO_2 concentration is further obscured by the American Coalition for Clean Coal Electricity (ACCCE)'s use of the percentage change in atmospheric CO_2 concentration as their metric of choice.[35] Clearly, any increase above the already very high concentration will only further exacerbate climate change and its effects.

34. Further, petitioners' focus on the Clean Power Plan's percentage reduction in total global CO_2 emissions fails to recognize the importance of the U.S. power sector and the leverage and multiplier effect that U.S. leadership on emissions

[34] *See* Coal Industry Mot. for Stay at 19; Utility and Allied Petitioners Mot. for Stay at 20; Oklahoma Mot. for Stay at 20.
[35] *See* ACCCE, *Climate Effects of EPA's Proposed Carbon Regulations* 1 (2014) (cited by Coal Industry Mot. for Stay at 20 n.69). ACCCE is a petitioner in this case.

reductions can have in promoting global action to reduce emissions in nations around the world. While it is true that no single sector or country dominates global CO_2 emissions, this only means that effective reduction of global emissions requires action by multiple sectors in multiple countries. What the Supreme Court said in its 2007 decision in *Massachusetts v. EPA* applies equally to the global effort: Governments "do not generally resolve massive problems in one fell regulatory swoop. They instead whittle away at them over time."[36] It only makes sense to start with those source categories that are more significant relative to other sources, "even if their absolute contribution may appear to be small."[37] As discussed further below and in the declaration of former Secretary of State Madeleine Albright, U.S. leadership manifested through the Clean Power Plan and its other domestic actions has played a crucial role in leveraging emissions reduction commitments from more than 150 other countries. *See infra* ¶¶ 48–49.

35. In any event, the U.S. power industry's contribution to climate change is not small. Power plants represent nearly 40% of U.S. CO_2 emissions and are the most significant source of CO_2 emissions in the country. U.S. power plant emissions currently represent over 6% of annual global CO_2 emissions[38]—roughly the same share as the total annual emissions from India, the third largest overall emitter.[39] The Clean Power Plan's call for a reduction of around 410 million metric tons of annual

[36] 549 U.S. 497, 524 (2007) (citation omitted).
[37] *See* 74 Fed. Reg. 66,496, 66,538–39 (Dec. 15, 2009).
[38] U.S. global share of CO_2 emissions (~16%) x U.S. power plants' share of U.S. CO_2 emissions (~40%) = U.S. power plants' share of global CO_2 emissions (~6.4%).
[39] *Compare* 80 Fed. Reg. at 64,689 (2013 emissions for U.S. power plants of 2.04 billion metric tons CO_2), *with CO2 Time Series 1990-2013 Per Region/Country*, *supra* note 33 (2013 emissions for India of 2.07 billion metric tons CO_2).

CO_2 emissions reductions by 2030[40] compared to 2013 emissions is also not small. This projected *reduction* in annual emissions from U.S. power plants is roughly equivalent to the *total* 2013 emissions of Iran, Australia, Italy, or France, and is greater than the emissions of roughly 180 nations for which emissions data are available.[41]

36. ACCCE's calculation of the effect that the Clean Power Plan would have on global average temperature by 2050[42] is also a misleading metric for evaluating the effects of a delay in the Plan's projected emissions reductions. First, the use of the increase in the *global average* temperature masks the importance of associated regional temperature changes. For example, temperature increases over land and in the Arctic, including in Alaska, are larger, even much larger, than the increase in global average temperature.[43] Second, ACCCE's focus on the increase in global average temperature in 2050 ignores the longer-term increase in temperature and associated impacts that would result over the following decades and centuries. As a result, ACCCE's 2050 global average temperature projection is roughly half of the long-term equilibrium global warming that would be avoided by the Plan.

37. ACCCE's projection of sea-level rise by 2050[44] has similar flaws. Changes in sea level in response to the warming influence of a higher atmospheric CO_2 concentration involve long-term processes that are only in their earliest phase by

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[40] The Clean Power Plan's objective is to reduce CO_2 emissions from power plants 32% below 2005 levels by 2030 (*i.e.*, from ~2.4 billion tons of CO_2 per year to ~1.63 billion tons of CO_2 per year). *See* 80 Fed. Reg. at 64,655, 64,689 tbl. 4. EPA's 2013 inventory indicates that emissions have already dropped about 15% to ~2.04 billion tons of CO_2 per year, leaving only 410 million tons of annual CO_2 emissions reductions to go by 2030. *See* 80 Fed. Reg. at 64,655, 64,689 tbl. 4.

[41] *See CO₂ Time Series 1990-2013 Per Region/Country*, *supra* note 33. Iran, Australia, Italy, and France were the 14th through 17th largest CO_2 emitters in 2013, respectively.

[42] *See* Coal Industry Mot. for Stay at 20 & n.69 (citing ACCCE, *supra* note 35).

[43] *See* ACIA, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment (Synthesis Report)* 10 (2004).

[44] *See* Coal Industry Mot. for Stay at 20 & n.69 (citing ACCCE, *supra* note 35).

2050. The paleoclimatic record shows the serious shortcomings of petitioners' choice to only present a 2050 value for sea-level rise. In particular, the paleoclimatic record suggests a long-term, equilibrium response of sea level to changes in global average temperature of ~30 feet for each degree Fahrenheit of warming.[45] The values that petitioners present (0.2 mm rise in sea level for a warming of 0.01°F) converts to a rate of sea-level rise of ~0.8 inches for each degree Fahrenheit change, or a factor that is about 1/450th of the equilibrium change evident from geological records. In looking only to 2050, ACCCE's metric thus fails to capture the potential long-term mitigative effects of the Plan's emissions reductions on sea-level rise.

38. Finally, none of the metrics used by petitioners account for the long-term and irreversible changes in climate that are above and beyond impacts evident in the near-term. For example, petitioners do not account for the losses of individual species or communities of species caused by climate change, even though the reduction in biodiversity and the loss of ecological services (*i.e.*, the air and water purifying effects of forests, the habitats of species, etc.) could be very disruptive. Nor do petitioners account for the risks of other nonlinear and irreversible consequences that grow as warming continues.

[45] Reconstructions of the global average temperature from the peak of the Last Glacial Maximum about 20,000 years ago suggest that it was ~6°C colder than present and that the sea level was lower by ~120 meters, providing a rate of change of ~20 meters per degree Celsius of warming. Tens of millions of years ago, the global average temperature was ~4°C higher than present and the Greenland and Antarctic ice sheets were virtually absent, suggesting a rate of rise of sea level by ~15 meters per degree Celsius of warming. Converting units, 17.5 meters per degree Celsius is equivalent to ~30 feet of sea-level rise per degree Fahrenheit of warming.

Finding V. Delaying the Clean Power Plan's emissions reductions would have quantifiable economic costs totaling many billions of dollars.

39. In their requests for a stay of the Clean Power Plan, petitioners failed to present any estimate of the economic costs (*i.e.*, foregone benefits) that would be incurred if the Plan's emissions reductions are delayed.[46]

40. Following the Supreme Court's ruling in 2007 that EPA was required to consider regulation of CO_2 tailpipe emissions under the Clean Air Act,[47] the Office of Management and Budget (OMB) led an interagency effort to consider the wide range of climate impacts associated with CO_2 pollution, and to quantify the global economic costs to society from each additional metric ton of CO_2 emissions and global economic benefits to society expected to result from regulations that reduce those emissions.[48] Since their first estimate of what has come to be known as the "Social Cost of Carbon," the interagency group has continued to lead efforts to improve and refine their estimates.[49]

41. The interagency group released a revised report on the social cost of carbon on July 2, 2015.[50] The report's "central" estimate for the social cost of carbon in 2015 is $40 per metric ton of CO_2.[51] "[B]ecause future emissions are expected to

[46] The requirement to carry out a cost-benefit analysis for environmental regulations dates back to the Reagan Administration, and is typically supported by industry and other regulated entities.
[47] *Massachusetts v. EPA*, 549 U.S. 497 (2007).
[48] *See* U.S. Interagency Working Grp. on Social Cost of Carbon, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis* (Feb. 2010), *available at* http://www3.epa.gov/otaq/climate/regulations/scc-tsd.pdf.
[49] *See* U.S. Interagency Working Grp. on Social Cost of Carbon, *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis* (rev. July 2015), *available at* https://www.whitehouse.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf. In making revisions, the agencies considered both the completeness of the estimate and how best to account for the relative importance of impacts projected to occur at various times in the future.
[50] *See* U.S. Interagency Working Grp. on Social Cost of Carbon, *supra* note 49.
[51] *See The Social Cost of Carbon*, U.S. EPA, http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html (adjusting the Interagency Working Group's costs from 2007$ to 2014$). The "central" estimate uses a 3% discount rate. The

produce larger incremental damages as physical and economic systems become more stressed in response to greater climatic change,"[52] the report's central estimate increases over time to $56 per metric ton of CO_2 in 2030, and then $77 per metric ton of CO_2 by 2050.[53] These values also serve as central estimates of the benefits to society from reducing or avoiding each metric ton of CO_2 emissions.

42. The U.S. government's estimates for the social cost of carbon are widely considered to be an underestimate of the true social cost because they omit impacts that are difficult to quantify or monetize;[54] indeed, some researchers have accounted for a wider range of climate impacts and estimated that the current social cost of carbon exceeds $200 per metric ton of CO_2, so five times the government's present central estimate.[55]

43. Assuming that a stay of the Clean Power Plan would result in delays of the interim (2022) and final (2030) emissions standards and projected emissions reductions, *see supra* ¶ 5, the societal and environmental cost of a stay of the Plan can be estimated. Assuming that a one-year stay will result in a one-year delay in the Plan's

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low estimate (using a 5% discount rate) for 2015 is $12 per metric ton of CO_2; the high estimate (2.5% discount rate) for 2015 is $62 per metric ton of CO_2. Some experts argue the discount rate should be zero for irreversible impacts such as loss of the Amazon rainforest or loss of species and impacts that span generations, which is one reason suggesting a much higher social cost of carbon.

[52] *See* U.S. Interagency Working Grp. on Social Cost of Carbon, *supra* note 49, at 13–14.

[53] *See The Social Cost of Carbon*, *supra* note 51.

[54] While the most recent Interagency Working Group analysis reduced some of the uncertainties associated with the social cost of carbon, EPA recognizes that the social cost of carbon does not account for all important climate change impacts. *See The Social Cost of Carbon*, *supra* note 51 (explaining that the models used to develop the social cost of carbon "do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research").

[55] *See, e.g.*, Frances C. Moore & Delavane B. Diaz, *Temperature Impacts on Economic Growth Warrant Stringent Mitigation Policy*, 5 Nature Climate Change 127 (2015); Laurie Johnson & Chris Hope, *The Social Cost of Carbon in U.S. Regulatory Impact Analysis: An Introduction and Critique*, 2 J. Envtl. Studies & Sci. 205 (2012).

projected emissions reduction trajectory (*i.e.*, that it moves the projected 2022-2030 reductions back to 2023-2031), straightforward calculations from EPA's Regulatory Impact Analysis indicate that the emissions reductions foregone over this period due to a one-year stay would total 220 million metric tons of CO_2:

Table 1: Emissions Consequences of One-Year Delay (MMT CO_2)[56]

Year	National emissions (rate-based)	One-Year Delay	Emissions Delta
2020	1892		
2021	1865	1892	
2022	1837	1865	28
2023	1810	1837	28
2024	1782	1810	28
2025	1754	1782	28
2026	1732	1754	22
2027	1710	1732	22
2028	1688	1710	22
2029	1667	1688	22
2030	1645	1667	22
2031		*1645*	
	Cumulative Delta:		**220**

44. Multiplying each year's lost emissions reductions (reflected by the "Emissions Delta" in Table 1) by the applicable value for the central estimate of the social cost of carbon, this calculation indicates that delaying the Clean Power Plan's emissions reductions by one year would result in total global climate-related costs of more than $11 billion:[57]

[56] Projection compiled from EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, EPA 452/R-15-003 at 3-19 (Aug. 2015), *available at* http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf, and assuming linear emission reductions between 2020 and 2025, and between 2025 and 2030. All values converted to metric tons using the equivalence: 1 short ton = 0.907185 metric tons. Due to rounding of values in the "national emissions" and "one-year delay" columns, the difference in those columns may not match values in "emissions delta" column.

[57] This estimate does not include the co-benefits to society of reductions of other air pollutants under the Clean Power Plan (*i.e.*, the power plant pollutants that form dangerous fine particles and ozone). Delay in implementation of the Plan would also result in a loss of these large health benefits. EPA estimates that, in 2030, the annual net benefits of the Clean Power Plan—accounting for

Table 2: Social Costs of One-Year Delay (Million 2014$)[58]

Year	Emissions Delta	Social Cost of Carbon (3% discount rate, 2014$ per metric ton CO_2)	Total Social Costs
2020		47	
2021		48	
2022	28	49	1,341
2023	28	49	1,363
2024	28	50	1,385
2025	28	51	1,407
2026	22	52	1,142
2027	22	53	1,164
2028	22	54	1,186
2029	22	55	1,208
2030	22	56	1,230
		Cumulative Costs:	**11,426**

45. It bears repeating that the conservative estimate of direct economic costs of a stay of the Clean Power Plan, as described above, includes only some costs related to the increasing possibility that thresholds of very serious and generally irreversible impacts will be exceeded, initiating significant adverse impacts that will grow over time. Examples include: a sharp acceleration of the rate of loss of mass from the Greenland and/or Antarctic ice sheets, with consequent acceleration of sea-level rise; the thawing and oxidation of the carbon held now in permafrost, leading to a large additional contribution to the warming influences caused by human activities; and large shifts in the optimal ranges of plant and animal species that result in increased species extinctions. *See supra* ¶¶ 26–28. As Justice Stevens recognized when

climate benefits plus air pollution health co-benefits, minus total compliance costs—will total between $26 and $45 billion dollars (2011$) per year. *See* 80 Fed. Reg. 64,680–81 tbls. 1–2.

[58] The estimated social cost of carbon for the years 2020, 2025, and 2030 were obtained from *The Social Cost of Carbon*, *supra* note 51. The social cost of carbon for the interim years was calculated assuming a linear rate of increase between 2020 and 2025, and between 2025 and 2030. Due to rounding of values in the "emissions delta" and "social cost of carbon" columns, the products of those columns may not match values in "total social costs" column.

writing for the majority in *Massachusetts v. EPA*, even small increments in major impacts (*e.g.*, sea-level rise and the additional inundation of public lands) involve consequences that cannot be ignored.[59] Petitioners simply do not mention such risks.

Finding VI. A stay of the Clean Power Plan could have negative effects on implementation of international climate commitments.

46. Petitioners fail to recognize the significant negative effects that a stay of the Clean Power Plan could have on the implementation of international commitments to reduce CO_2 emissions and therefore to limit climate change. Petitioners' claims that the emissions reductions involved in the Clean Power Plan are insignificant[60] therefore fail to account for the significant contribution of the Plan to international emissions reductions efforts.

47. All nations will need to contribute significantly to meet the internationally agreed target of limiting the increase in the global average temperature to 2ºC. *See supra* ¶¶ 23–24. The Clean Power Plan's role in this effort is critical, both in its own direct contribution to lowering emissions and in its role of demonstrating serious U.S. participation in and leadership of global efforts.

48. Because the United States is the world's largest economy and plays a leading role in all manner of global affairs, U.S. participation and leadership are essential to galvanizing and sustaining global efforts to curb CO_2 emissions.[61] U.S. domestic action on CO_2 emissions was crucial in negotiating emissions reduction

[59] *See* 549 U.S. 497, 521–23 (2007).
[60] *See* Coal Industry Mot. for Stay at 19; Utility and Allied Petitioners Mot. for Stay at 20; Oklahoma Mot. for Stay at 20.
[61] *See* Albright Decl. ¶¶ 4, 8, 11.

commitments from China that, in turn, have triggered a wave of commitments from other nations.[62]

49. A stay of the Clean Power Plan could thus seriously undermine the follow-through on national commitments to emissions reductions. As former Secretary of State Madeleine Albright explains in her concurrently submitted statement, "[a] stay of the Clean Power Plan could derail the international momentum to implement the emission reduction commitments achieved at the Paris Climate Conference."[63] Any delay of the implementation of these commitments (or worse still, the commitment's retractions) would have significant environmental and societal consequences.

50. In advance of the Paris negotiations, over 150 countries had committed to reduce their projected total annual CO_2 emissions by around 3.6 billion metric tons per year by 2030 (equivalent to about 10% of current emissions).[64] While this cutback from projected emissions is not as much as is needed to limit global warming to no more than 2ºC, achieving such a reduction would dramatically alter the existing, unsustainable trend that saw annual global CO_2 emissions grow by about 9 billion metric tons of CO_2 (~36%) from 2001 to 2011.[65]

51. Applying the 2030 value of the social cost of carbon to the proposed international emissions reduction commitments for the Paris Conference of the

[62] Albright Decl. ¶¶ 4–5.
[63] Albright Decl. ¶ 9.
[64] *See* UNFCCC, *Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions* 10 (Oct. 30, 2015), *available at* http://unfccc.int/resource/docs/2015/cop21/eng/07.pdf.
[65] T.A. Boden, G. Marland, & R.J. Andres, Carbon Dioxide Information Analysis Ctr., Oak Ridge Nat'l Lab., U.S. Dep't of Energy, *Global, Regional, and National Fossil-Fuel CO_2 Emissions*, DOI 10.3334/CDIAC/00001_V2015, *available at* http://cdiac.ornl.gov/trends/emis/tre_glob_2011.html.

Parties indicates that such actions would by 2030 be providing over $200 billion per year in reduced global impacts on the environment and society.[66]

52. Further, some economists have estimated that fulfillment of the non-U.S. pre-Paris commitments could generate upwards of $500 billion dollars in total direct benefits to the United States between 2015 and 2030.[67]

53. A stay of the Clean Power Plan, by threatening the international consensus to follow through on emissions reductions commitments, would similarly threaten these significant and quantifiable global and U.S. near-term benefits of actions to limit CO_2 emissions and climate change.

54. Petitioners' claims also fail to appreciate the unique nature of CO_2, namely that emissions from any single nation affects all nations, making it necessary that all countries be involved in limiting emissions. That the Clean Power Plan's projected emissions reductions for 2030 are roughly equivalent to the total 2013 emissions of industrialized nations like Australia and France, *supra* ¶ 35, further underscores petitioners' fundamental misunderstanding of the climate change problem. As EPA noted when responding to similar arguments in its Endangerment Finding, petitioners' "approach, if used globally, would effectively lead to a tragedy of the commons, whereby no country or source category would be accountable for contributing to the global problem of climate change, and nobody would take action as the problem persists and worsens."[68]

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[66] Avoided Emissions (~3.6 billion metric tons CO_2) x 2030 social cost of carbon ($56 per metric ton CO_2 per year) = Total Annual Social Cost of Carbon ($201.6 billion per year).
[67] *See* Dr. Peter Howard & Jason Schwartz, *Foreign Action, Inst. for Policy Integrity, Domestic Windfall: The U.S. Economy Stands to Gain Trillions from Foreign Climate Action*, 2 (Nov. 2015), *available at* http://policyintegrity.org/files/publications/ForeignActionDomesticWindfall.pdf.
[68] 74 Fed. Reg. at 66,543.

CONCLUSION

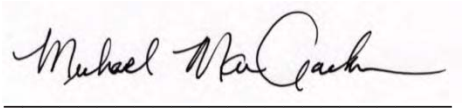
55. Petitioners' claims regarding the climate impacts of a stay of the Clean Power Plan misunderstand or ignore fundamental principles underlying the science of climate change. Properly accounting for these principles, it is my expert opinion as a climate scientist that a stay of the Clean Power Plan would significantly add to the environmental and societal harm being caused by ongoing CO_2 emissions and threaten necessary and time-sensitive international actions aimed at limiting climate change and its impacts.

56. For decades, the overwhelming consensus of the scientific community has identified human-caused climate change as a serious international issue concerning the future of the Earth's environment, economies, and societal well-being. Scientific and other expert analyses make clear that early action in limiting emissions will reduce the overall impacts of climate change, and that delays in emissions reductions will lock in further long-term climate change and make preventing the worst effects of climate disruption more difficult, if not impossible, as thresholds of nonlinear and irreversible consequences are exceeded. Continued delay would ignore the peril that climate change is already causing (as confirmed by decades of scientific research and many lines of evidence) and set a disappointing precedent for rational decision-making based on scientific understanding. As Nobel Laureate Professor Sherwood Rowland commented: "What's the use of having developed a science well enough to make predictions, if in the end, all we're willing to do is stand around and wait for them to come true?"[69]

[69] *See* Paul Brodeur, *Annals of Chemistry: In the Face of Doubt*, The New Yorker 70 (June 9, 1986).

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on December 4, 2015.



Michael C. MacCracken

APPENDIX A - QUALIFICATIONS AND EXPERIENCE

I received my Bachelor of Science in Engineering with high honors in aerospace and mechanical sciences from Princeton University in 1964, and received my Master of Science and Ph.D. degrees in applied science (applied physics) from the University of California Davis in 1966 and 1968, respectively. For my dissertation, I constructed one of the world's first computer-based climate models and applied the model to quantitatively evaluate the plausibility of several hypotheses about the causes of glacial-interglacial cycling.

From 1968 to 2002, I worked as a physicist at the University of California's Lawrence Livermore National Laboratory (LLNL). From 1968 to 1993, I led scientific projects relating to analysis of natural and human influences on regional air pollution and on the global climate, and also served in various advisory capacities for the climate change research program managed by the Department of Energy.

From 1993 to 2002, I was on assignment from LLNL, serving as senior scientist on global change at the Office of the U.S. Global Change Research Program (USGCRP), which coordinated research on climate change and related issues across roughly a dozen federal agencies. During this assignment, I served as the first executive director of the Office from 1993 to 1997, and then as executive director of the National Assessment Coordination Office (NACO) from 1997 through 2001. As the NACO Executive Director, I facilitated preparation of the USGCRP's first National Assessment of the Potential Consequences of Climate Variability and Change,[1] and also prepared the chapter on climate change impacts (Chapter 6) of the U.S. Government's *Climate Action Report 2002*,[2] which was the government's official quadrennial communication under the United Nations Framework Convention on Climate Change (UNFCCC).

Since retiring from LLNL in September 2002, I have served, largely on a *pro bono* basis, as Chief Scientist for Climate Change Programs with the Climate Institute in Washington, DC. The Climate Institute is the oldest non-governmental organization solely focused on understanding and helping to address climate change.

Over the past twenty-five years, I have also served in various capacities in the preparation of the First, Second, Third, Fourth, and Fifth Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC), the international organization responsible for preparing authoritative scientific assessments of the science of climate change, impacts and adaptation, and mitigation and policy options. I also served on the thirteen-member Assessment Integration Team of the eight-nation Arctic Climate Impacts Assessment (ACIA) completed in 2004. From 2004 to 2007, I was a member of the Scientific Expert Group on Climate Change and Sustainable Development, organized by Sigma Xi, The Scientific Research Society, and the UN Foundation, that prepared a report for the UN Commission on Sustainable Development indicating the types of actions needed to simultaneously address the issues of climate change and

[1] USGCRP, *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change: Overview Report* (2000) and *Foundation Report* (2001).
[2] U.S. Dept. of State, *U.S. Climate Action Report –2002* (2002).

sustainability, particularly the important need to limit emissions of CO_2 and methane to slow global warming and associated impacts. In 2003, I was elected to a four-year term as President of the International Association of Meteorology and Atmospheric Sciences (IAMAS), which is an international scientific organization sponsored by the national academies of science of over sixty leading nations, and I remain associated with IAMAS, both scientifically and organizationally. From 2003-2011, I served as the international atmospheric sciences representative on the executive committee of the Scientific Committee on Oceanic Research, which oversees the scientific aspects of international ocean research programs.

Since the start of my career in 1968, my primary scientific focus has been on the natural and anthropogenic causes of climate change and its consequent impacts. In addition to authoring papers and reports and endeavoring to keep current with the explosion of the relevant scientific literature, I often serve as an authoritative reviewer for scientific publications and reports for interested organizations, such as the World Bank. I also serve on the advisory boards of the Environmental and Energy Study Institute, the National Center for Science Education, and several other organizations relating to public communication of the science of climate change.

Since 2002, I have prepared expert declarations for a number of legal cases relating to climate change. My first declaration was in support of petitioners' standing in what became *Massachusetts v. EPA*, 549 U.S. 497 (2007), and was cited favorably by Justice Stevens in the majority opinion. *Id.* at 515–24. I have also prepared declarations in lawsuits seeking to require the U.S. government to prepare environmental impact statements for actions that would increase greenhouse gas emissions;[3] declarations that described the climate and environmental consequences of the extraction and combustion of coal from federal lands;[4] and a declaration in a lawsuit challenging an agency's failure to supplement its environment impact analysis for the federal coal program to more completely assess the program's climate effects.[5]

My findings in the above declaration are offered as my expert scientific opinion, based on my education, qualifications, experience, and knowledge of the relevant scientific literature and national, regional, and international assessment processes. Having participated in many of the above-described activities as a researcher, author, and/or reviewer, my opinions draw extensively on the strong scientific consensus regarding the science of climate change and its impacts as presented in the major national, regional, and international assessment reports that assemble, evaluate, and critically summarize the results of thousands of scientific papers going back twenty-five years and more. Each of these assessments has been thoroughly peer-reviewed and received formal approval by the U.S. Government as accurately representing the state of understanding of the science.

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[3] *See Sierra Club v. U.S. Def. Logistics Agency Energy*, Case No. 1:11-cv-0041 (E.D. Va.); *Friends of the Earth, Inc. v. Watson*, Case No. 02-4106 (N.D. Cal.).

[4] *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, Case No. 1:11-cv-01481 (D.D.C.); *WildEarth Guardians v. U.S. Bureau of Land Management*, Case 2:12-cv-00085 (D. Wyo.).

[5] *W. Org. of Res. Councils v. Jewell*, Case No. 1:14-cv-01993, Dkt. No. 1-1 (D.D.C.).

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

STATE OF WEST VIRGINIA, *et al.*, Petitioners. v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.* Respondent.	No. 15-1363 (and consolidated cases)

DECLARATION OF JONATHAN I. LEVY, SC.D.
BOSTON UNIVERSITY SCHOOL OF PUBLIC HEALTH

I, Jonathan I. Levy, state and declare as follows:

I. Purpose of this Declaration

1. I provide this declaration supporting the Opposition of the American Lung Association, Center for Biological Diversity, Clean Air Council, Clean Wisconsin, Conservation Law Foundation, Environmental Defense Fund, Natural Resources Defense Council, The Ohio Environmental Council, and the Sierra Club ("Public Health and Environmental Intervenors") to Motions to Stay filed by various states and industry interests. The Motions ask this Court to halt the implementation of all aspects of the final "Carbon Pollution Emissions Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64662 (October 23, 2015) ("the Clean Power Plan"), during the pendency of this litigation.

2. I provide this declaration describing my understanding of the public health consequences resulting from any further delay in the 2022 start of phased-in compliance with the final Clean Power Plan guidelines, as may result from a stay of the rule if one is granted by the court. I offer my opinions based on my professional experience, as outlined in Section II, including my general familiarity with the mathematical models used by the Agency to evaluate the outcomes of its regulations, to estimate the human health benefits resulting from its regulations, and in some instances, to derive estimates of the monetary value of those benefits. In particular, as described in more detail in Section II, my recent research includes an analysis of the air quality improvements and related public health co-benefits of three possible alternative U.S. existing power plant carbon dioxide standards, including a scenario similar to the proposed Clean Power Plan.[1]

3. In preparing this declaration I reviewed the Final Clean Power Plan preamble General Information and Summary of Rule Requirements sections, found at 80 Fed. Reg. 64,662, 64,663-64,682 & 64,707-64,709, and also the preamble's descriptions of the public health co-benefits (found at 80 Fed. Reg. 64,662, 64,679-64,682, 64,928-64,933 (Oct.23, 2015)) associated with two illustrative approaches states may choose to implement the Clean Power Plan's final guidelines. I also reviewed Chapters 3 and 4 of the Regulatory Impact Analysis for the Clean Power

[1] Driscoll CT, Buonocore JJ, Levy JI, Lambert KF, Burtraw D, Reid SB, Fakhyraei H, and Schwartz J. US power plant carbon standards and clean air and health co-benefits, Nature Climate Change 5: 535-540 (2015); *available at:* http://www.researchgate.net/publication/276455989_US_power_plant_carbon_standards_and_clean_air_and_health_co-benefits.

Plan Final Rule, discussing the Agency's methods for assessing the health co-benefits associated with controlling the existing power plant carbon dioxide pollution regulated by the Clean Power Plan, and the results of that analysis. I am also familiar generally with the EPA's Clean Power Plan proposed rule, as a consequence of my research. Additionally I have reviewed the Report entitled "Evaluation of the Immediate Impact of the Clean Power Plan Rule on the Coal Industry," prepared by Mr. Seth Schwartz of Energy Ventures Analysis, Inc., dated October 2015 (the "Energy Ventures Analysis"), and accompanying his declaration submitted on behalf of the National Mining Association in support of its Motion to Stay the effectiveness of the Clean Power Plan final rule.

II. Experience and Qualifications

4. I am currently a Professor and Associate Chair in the Department of Environmental Health at the Boston University School of Public Health, where I have been a Professor of Environmental Health since 2010. I am also an Adjunct Professor at the Harvard T.H. Chan School of Public Health in the Department of Environmental Health, having served as an Associate Professor from 2006-2010, and an Assistant Professor from 2001-2006. I hold a Doctor of Science (Sc.D.) degree from the Harvard T.H. Chan School of Public Health, where my dissertation was on "Environmental Health Effects of Energy Use: A Damage Function Approach," and a Bachelor of Arts (B.A.) from Harvard College in Applied Mathematics, Decision and Control.

5. I have researched and published extensively on the relationship between exposure to certain air pollutants and human health effects, including

developing models of exposures to air pollutants emitted by power plants and other sources using atmospheric dispersion models, quantifying the public health impacts associated with such exposures, and developing concentration-response functions used to assess the public health benefits of limiting emissions of particulate matter and other power plant air pollution.

6. Relevant to this declaration, I have been the principal investigator of numerous studies quantifying the health damages associated with emissions of fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), and nitrogen oxides (NOx) from power plants in different regions of the United States.[2, 3, 4, 5, 6, 7] I have also studied and published articles evaluating the association between exposure to the criteria air

[2] Levy JI, Spengler JD. Modeling the benefits of power plant emission controls in Massachusetts. J Air Waste Manage Assoc 52: 5-18 (2002).

[3] Levy JI, Spengler JD, Hlinka D, Sullivan D, Moon D. Using CALPUFF to evaluate the impacts of power plant emissions in Illinois: Model sensitivity and implications. Atmos Environ 36: 1063-1075 (2002).

[4] Levy JI, Greco SL, Spengler JD. The importance of population susceptibility for air pollution risk assessment: A case study of power plants near Washington, DC. Environ Health Perspect 110: 1253-1260 (2002).

[5] Levy JI, Wilson AM, Zwack LM. Quantifying the efficiency and equity implications of power plant air pollution control strategies in the United States. Environ Health Perspect 115: 740-750 (2007).

[6] Levy JI, Baxter LK, Schwartz J. Uncertainty and variability in environmental externalities from coal-fired power plants in the United States. Risk Anal 29: 1000-1014 (2009).

[7] Buonocore JJ, Dong X, Spengler JD, Fu JS, Levy JI. Using the Community Multiscale Air Quality (CMAQ) model to estimate public health impacts of $PM_{2.5}$ from individual power plants. Environ Int 68: 200-208 (2014).

pollutants ozone and $PM_{2.5}$ and various health outcomes,[8, 9] and I have worked on the differential toxicity of major fine particulate matter constituents[10] and the cumulative impact of various hazardous air pollutants on health endpoints.[11, 12]

7. I am, in the course of my work, also knowledgeable about others' current scientific research and analysis directed at assessing the health effects associated with exposures to different concentrations of ozone, $PM_{2.5}$, and the individual constituents of particulate matter air pollution.

8. Perhaps most relevant to this declaration is my work on a recent study assessing the public health co-benefits associated with three possible scenarios for design and implementation of carbon dioxide emissions standards for existing U.S. power plants.[13] One of the regulatory scenarios analyzed by our team had characteristics similar to EPA's proposed Clean Power Plan, although we modelled

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[8] Levy JI, Chemerynski SM, Sarnat JA. Ozone exposure and mortality: An empiric Bayes metaregression analysis. Epidemiology 16: 458-468 (2005).

[9] Levy JI, Hammitt JK, Spengler JD. Estimating the mortality impacts of particulate matter: What can be learned from between-study variability? Environ Health Perspect 108: 109-117 (2000).

[10] Levy JI, Diez D, Dou Y, Barr CD, Dominici F. A meta-analysis and multi-site time-series analysis of the differential toxicity of major fine particulate matter constituents. Am J Epidemiol 175: 1091-1099 (2012).

[11] Peters JL, Fabian MP, Levy JI. Combined impact of lead, cadmium, polychlorinated biphenyls and non-chemical risk factors on blood pressure in NHANES. Environ Res 132: 93-99 (2014).

[12] Loh MM, Levy JI, Spengler JD, Houseman EA, Bennett DH. Ranking cancer risks of organic hazardous air pollutants in the United States. Environ Health Perspect 115: 1160-1168 (2007).

[13] Driscoll, *et al*., *supra* n.1.

the possible health benefits for only one future year, not the phased-in approach to compliance between 2022 and 2030 finalized by the Agency. Our study used EPA's Integrated Planning Model to estimate the SO_2 and NOx emissions in 2020 from the 2,417 existing fossil-fuel-fired power plants in the U.S., under three carbon dioxide standard design scenarios and a reference case which included all existing and planned air quality policies for the power sector. We then modelled the resulting changes in air quality for the continental U.S., and used the results for ozone and $PM_{2.5}$ to estimate the public health co-benefits of each of the three design scenarios in comparison to the reference case. Exposures to ozone and $PM_{2.5}$ have well-understood health consequences.[14] We modelled health co-benefits that included reduced risk of premature death, avoided respiratory hospitalizations, avoided heart attacks, and avoided cardiovascular hospitalizations (except heart attacks). My work on the study included contributing to the health impact modelling, including the derivation of concentration-response functions. Our results show that carbon dioxide standards, including the design scenario most similar to the Clean Power Plan, can yield substantially decreased emissions of criteria air pollutants and can improve air quality and public health beyond what would occur under existing air quality policies.

9. Others also have described the direct public health benefits of reducing carbon dioxide and other climate pollution, including, for example, the lessened risk of heat-related illnesses, lowered ambient ozone levels due to lower

[14] Jerrett M, *et al.* Long-term ozone exposure and mortality. New Engl. J. Med. 360 1085-1095 (2009); Fann N, *et al.* Estimating the national public health burden associated with exposure to ambient $PM_{2.5}$ and ozone. Risk Anal. 32, 81-95 (2012).

average summer temperatures, and reduced risk of exposure to tropical diseases carried by intrusive insect vectors. Those public health benefits were not the subject of our research, and my statements in this declaration do not reflect them.

10. Among my professional service appointments, I was a member of U.S. EPA's Advisory Council on Clean Air Compliance Analysis from 2009-2014, a member of the National Research Council/Institute of Medicine Committee to Develop a Framework and Guidance for Health Impact Assessment from 2009-2011, and a member of the National Research Council Committee on Improving Risk Analysis Methods Used by U.S. EPA from 2006-2008. As part of my membership on the Advisory Council on Clean Air Compliance Analysis, I was part of the Health Effects Subcommittee (HES), which reviewed EPA's approach for modelling the health effects associated with reductions in $PM_{2.5}$ concentrations. I also served on the Black Carbon Review Panel, which evaluated EPA's Report to Congress on Black Carbon, considering the public health and climate implications of black carbon emissions. In general, I have served as a peer reviewer and scientific advisor of various health benefits modelling studies by U.S. EPA and other organizations since 2000.

11. A copy of my complete profile is available at: http://profiles.bu.edu/Jonathan.Levy.

III. The Use of Models and Concentration-Response Functions as Predictors of Health Endpoints

12. My research requires me to be generally familiar with the mathematical models used to project possible future scenarios for the

interconnected network of existing U.S. power plants as a result of implementing various regulatory requirements. For example, I am generally familiar with how the U.S. EPA's Integrated Planning Model translates input assumptions about regulatory requirements into pollution emissions outcomes, predicting how the existing U.S. power plant fleet will respond to those requirements, for example by applying controls, changing fuels, improving efficiency, switching to lower or non-emitting generation types, or taking other steps.

13. Additionally, my work requires familiarity with other models used to predict how changes in emissions from U.S. power plants might change air quality across the country, and that translate air quality improvements, particularly in $PM_{2.5}$ and ozone levels, into expected public health improvements.

14. Based on my experience and familiarity with these models, and with the modelling of complex systems generally, I can say that the output from these modelling exercises are not absolutely predictive, even where, in contrast to the flexible Clean Power Plan, the regulatory requirements modelled are source-specific. For example, the Integrated Planning Model is a linear programming model that gives the least-cost strategy to provide electricity under various regulatory and system constraints, assuming perfect foresight and optimal cost-minimizing behavior by all parties. A National Research Council report on New Source Review for Stationary Sources of Air Pollution, which I co-authored, included extensive discussion of the strengths of the Integrated Planning Model in

providing quantitative insight about the comparative health effects of regulatory policy choices, but cautioned against over-interpreting the outputs. [15]

15. The results of modelling exercises offer the ability to compare possible outcomes of different regulatory scenarios, but they cannot be described (as does the Energy Ventures Analysis) as foretelling any particular outcome with certainty. That is particularly true when modelling the Clean Power Plan, which presents each state with several options for structuring its state plan and anticipates that each source will be able to use flexible compliance options.

IV. U.S. EPA's Clean Power Plan

16. I am aware that the final Clean Power Plan guidelines set two nationally uniform emission rate limits, one for fossil steam units and one for natural gas combined cycle (NGCC) units, with the implementation options of state-level target carbon dioxide emissions rates or state-level mass-based emissions budgets. States have the final say as to how the emissions limits will be implemented. In a market-based program, the state's power sector will then have the flexibility to comply through some combination of controls, fuel-switching, re-dispatch to lower or non-emitting plants, or the acquisition of emissions allowances or credits.

17. Actual compliance with the Clean Power Plan state budgets is phased in, with measured compliance beginning in 2022, and final compliance in 2030. I

[15] National Research Council of the National Academies. New Source Review for Stationary Sources of Air Pollution. National Academies Press: Washington, DC (2006).

understand that the final Clean Power Plan schedule for compliance is two years delayed as compared with the phased compliance schedule beginning in 2020 that was originally proposed by EPA. I understand this delay in compliance as compared with the Clean Power Plan proposal came in response to comments received seeking more time for the start of compliance.

18. I understand that EPA's final Clean Power Plan allows states up to three years to develop and submit final state plans. I further understand that the final Clean Power Plan offers states flexibility to choose a method for compliance with the state-specific targets. For example, states can adopt state plans in which the emissions limits are implemented on a rate- or mass-basis, and states can choose whether to allow interstate trading of compliance instruments (credits or allowances).

19. I understand that U.S. EPA modelled two alternative illustrative options for complying with the final Clean Power Plan guidelines, using the Integrated Planning Model. The options were intended to illustrate how the rate-based and mass-based approaches might operate, but were not intended to simulate the outcomes of the Clean Power Plan as implemented. For example, each state is assumed to achieve its goal independently within the illustrative options, whereas the Final Rule allows interstate trading. Other flexibilities present in the Clean Power Plan, such as banking of reductions, were not simulated in the Integrated Planning Model runs.

20. U.S. EPA's Regulatory Impact Analysis explains that in addition to reducing carbon dioxide emissions, the Agency's modelling of the two illustrative

compliance options shows that the final Clean Power Plan is expected to achieve co-benefits in the form of reductions in emissions of SO_2 and NOx, which are precursors to formation of ambient $PM_{2.5}$ and ozone, below the levels expected from the reference case including all other regulatory requirements in 2022 and 2030. This is consistent with the results we saw in our study modelling the health benefits associated with three approaches to existing power plant carbon dioxide emissions.

V. U.S. EPA's Assessment of the Health Benefits of the Final Clean Power Plan Guidelines for States

21. U.S. EPA assessed the possible public health co-benefits of the two illustrative final Clean Power Plan compliance options, using much the same process as was used by my colleagues and myself to evaluate the public health outcomes of three options for carbon dioxide emissions reductions from existing U.S. power plants. Specifically, the Agency used the results of its Integrated Planning Model runs to estimate emissions reductions for precursors to $PM_{2.5}$ and ozone associated with each illustrative compliance scenario. The Agency then derived public health endpoints from the estimated air quality improvements, applying a damage-function approach, including concentration-response functions linking changes in air pollution with specific public health outcomes. This process and the equations used in it are widely accepted, and the fidelity of the calculations therefore depends on the fidelity of the input variables.

22. EPA estimates that its two illustrative modelled scenarios for Clean Power Plan compliance will yield health co-benefits due to resulting lower ambient

levels of $PM_{2.5}$ and ozone, including avoided premature mortality, and avoided morbidity including reduced asthma attacks requiring emergency department visits, reduced cases of acute bronchitis in children aged 8-12, reduced incidence of lower respiratory symptoms in children ages 7-14 and reduced incidence of upper respiratory symptoms in asthmatic children ages 9-11, fewer lost work days, less asthma exacerbation in children aged 6-18, fewer hospital admissions for respiratory symptoms for all ages and for cardiovascular symptoms in adults, fewer non-fatal heart attacks, and fewer restricted activity days and school absence days. EPA documents these results for the years 2020, 2025, and 2030 in the Regulatory Impact Analysis accompanying the final Clean Power Plan, at Chapter 4, Tables 4-22 through 4-27. Although the Clean Power Plan emissions limits are first imposed in the Integrated Planning Model in the 2025 model period (representing the interim compliance period), EPA projects that there will be resulting emissions reductions in the 2020 period as well, as the power sector prepares for the emissions limits.

23. Many of the improved health outcomes associated with the start of compliance with the Clean Power Plan are based on short-term exposure changes, so that health benefits would be exhibited within a matter of days after air pollution levels decrease. Reduced risk of premature mortality associated with $PM_{2.5}$, however, is based on long-term exposures, and so there is a "cessation lag time" or delay of years between reductions in the air pollution and the realization of those benefits. Following guidance and evidence from the literature, U.S. EPA assumes that 30 percent of $PM_{2.5}$ mortality benefits occur in the first year after reductions in

exposures, with 50 percent over years 2 through 5 and the remaining 20 percent over years 6 through 20.

24. Having assessed the health co-benefits of its illustrative approaches to Clean Power Plan compliance, EPA then monetized some of those co-benefits using standard approaches for economic valuation of health outcomes. EPA estimates total monetized co-benefits of the mass-based illustrative plan in 2030 to be between 12 and 28 billion dollars ($2011) per year using a 3% discount rate, or between 11 and 26 billion dollars ($2011) per year using a 7% discount rate.

25. EPA also describes other, unquantified public health benefits, that cannot be monetized, but that the Agency expects will occur as a result of compliance with the CPP beginning in 2022. These include reduced incidence of morbidity (hospitalizations, chronic lung disease, asthma exacerbation, acute respiratory symptoms, other respiratory effects, and premature mortality) due to exposure to nitrogen dioxide (NO_2); reduced incidence of morbidity (hospitalizations, asthma emergency visits, asthma exacerbation and other respiratory effects, and premature mortality) due to exposure to SO_2; reduced incidence of morbidity (cardiovascular effects, respiratory effects, central nervous system effects, and premature mortality) due to exposure to carbon monoxide (CO); and reduced incidence of morbidity (neurologic effects—IQ loss) due to exposure to methylmercury). I agree with this assessment of the possible co-benefits of compliance with the Clean Power Plan.

VI. The Potential Effects of Staying the Effectiveness of the Clean Power Plan.

26. It must be stressed that U.S. EPA's Clean Power Plan compliance modelling is based on illustrative cases, showing two policy options a state may choose (not assessments of absolutely required or mandated source-specific compliance scenarios). For that reason and because the Integrated Planning Model is not, in any event, absolutely predictive, it is my strong opinion that U.S. EPA's illustrative modelling outcomes cannot be used to predict with certainty that any particular power plant or coal mine will close as a result of Clean Power Plan compliance. Furthermore, as the Agency notes, its modelled estimates of the co-benefits of Clean Power Plan compliance are properly thought of as representing the general magnitude of the benefits associated with each approach, as opposed to precise expected outcomes, due to the state-guideline nature of the Plan and the compliance flexibility it offers power plant owners and operators.

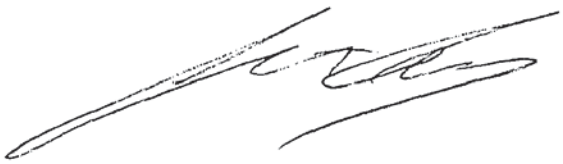
27. Because actual compliance with the final Clean Power Plan guidelines by states and the affected existing fossil-fuel-fired power plants is now not required to begin until 2022, with full compliance not until 2030, there is already a two year lag in the achievement of the public health and environmental benefits of the Clean Power Plan, as compared with the schedule U.S. EPA initially proposed.

28. Based on my understanding of power plant health impact assessment science and modelling, it is clear to me that any further delay – as could occur if a stay of the Clean Power Plan is granted – will have the effect of further delaying the start of state planning processes, and most significantly also the start of the emissions reductions that will produce the Clean Power Plan's public health and

environmental benefits and co-benefits. Delaying Clean Power Plan implementation, as the result of a stay of the rule, will result in continued health damage -- there will be additional years of morbidity and risk of premature death due to continued exposures to higher levels of ambient $PM_{2.5}$ and ozone than would be the case without the delay in Clean Power Plan implementation.

I declare under the penalty of perjury under the laws of the United States, that to the best of my knowledge, the foregoing is true and correct.

Executed on December 4, 2015, at Boston, Massachusetts.



Jonathan I. Levy

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)))))))))	Case No. 15-1363 (and consolidated cases)

DECLARATION OF MARY KAY HENRY

I, Mary Kay Henry, declare as follows:

1. I am International President of the Service Employees International Union ("SEIU"). As International President, I lead and oversee all aspects of SEIU's work. I have led SEIU as President since 2010 and have been a leader in the labor union movement since 1979. Prior to assuming the top leadership position at SEIU, I led the Union's Healthcare Division.

2. SEIU is a labor union of more than two million people in the United States (including Puerto Rico) and Canada. We are the largest health care union in the United States. More than half of SEIU's two million members work in the health care industry, including as doctors, nurses, nursing assistants, therapists, technicians, administrative staff, janitorial workers, and food service staff. SEIU also represents workers in the property service industries. Approximately 250,000 SEIU property

services workers nationwide clean, maintain, and provide security for commercial office buildings, co-ops, and apartment buildings, as well as public facilities like theaters, stadiums, and airports. SEIU is one of the largest unions of public service employees with more than one million local and state government workers, public school employees, bus drivers, and child care providers, including approximately 80,000 early learning and child care professionals.

3. SEIU has long been concerned about the effects of climate change on our members and workers globally. In 2006 SEIU became a partner in the BlueGreen Alliance, an organization that unites 14 of the nation's largest unions and environmental groups who aim to be a powerful voice for a cleaner environment and a more equitable economy. At our 2012 Convention, SEIU adopted a resolution titled "Strengthening Strategic Alliances to Promote Environmental Justice, Sustainability and Good Green Jobs," where it resolved to fight for equal protection for all communities from environmental and health hazards, support U.S. and global carbon emissions reductions goals, and expand the scope of existing jobs to include responsibilities that impact energy, carbon emissions, and sustainability.

4. More recently, SEIU has focused its interest in climate change through the Union's 21st Century Blueprint Committee, a group of leaders and staff that have studied trends that will impact workers and their families in the remainder of the 21st century. This group has concluded that climate change is already having an inescapable impact on the future of work. SEIU has begun to study more closely the effects of climate change on our members and their communities, and to develop solutions at both the local and international level. For example, the Union's research

reveals that the built environment accounts for a significant share of greenhouse gas emissions; thus, SEIU members are addressing climate change through an increased focus on sustainability in buildings. Building service workers in commercial real estate, hospitals, public buildings, and multi-family residential buildings are improving their skills so that they can play their part in making their buildings as sustainable as possible. The Union's "1000 Green Supers" program has trained thousands of building service workers to retrofit, recommission, and maintain multi-family housings units across New York City.

5. SEIU's strong concern about climate change also stems from two missions that underlie all of the Union's work. First, our primary mission is to achieve social and economic justice for all workers and their families. A significant portion of SEIU members are people of color, who are part of communities that are already disproportionately affected by climate change. Second, as the largest union of health care workers in the United States, SEIU works every day to address issues of public health and access to quality healthcare. Our members understand that climate change is one of the most significant threats to the fulfillment of both these goals. Our members, many of whom live, or are caregivers in vulnerable communities, have experienced extreme weather events and pollution-related health conditions that have become increasingly common consequences of climate change.

6. SEIU recognizes that power plants are the single biggest source of carbon pollution in the United States. The Clean Power Plan will provide important health benefits for the communities where our members live and work. It will reduce carbon emissions that result in climate change, and therefore, illnesses that

extreme weather events have exacerbated, such as heat-related illnesses and insect and waterborne diseases. According to the EPA's impact analysis, because reductions in carbon emissions also reduce conventional air pollution, the EPA estimates that by 2030 the Rule will avoid up to 3,600 premature deaths, 1,700 heart attacks, 90,000 asthma attacks in children, and 300,000 missed days of work and school. The Clean Power Plan will significantly reduce the pollutants that cause and contribute to life-threatening respiratory illnesses such as lung cancer and pulmonary diseases, which disproportionately affect people of color, including our members and their patients. SEIU believes that the Clean Power Plan's health benefits to the communities where our members live and work will be enormous. We know that one in six African-American children, which many of our members care for, has asthma, as compared to one in nine nationwide.[1] Likewise, African-American children are three times more likely to be admitted to the hospital for an asthma attack and twice as likely to die of asthma.[2] Many of SEIU's own members suffer from asthma themselves.

7. As environmental justice advocates and scholars have shown, many of the nation's coal-fired power plants are located in or adjacent to low-income and minority communities.[3] For example, of the six million people living near coal-

[1] Environmental Protection Agency, EPA's Clean Power Plan, Climate Change, and African Americans, *available at* http://www3.epa.gov/airquality/cppcommunity/afam-climate-change.pdf, at 1.
[2] *See* NAACP Statement on President Obama's Clean Power Plan, *available at* http://www.naacp.org/press/entry/naacp-statement-on-president-obamas-clean-power-plan.
[3] *See, e.g.*, NAACP, "Coal Blooded: Putting Profits before People," *available at* http://www.naacp.org/pages/coal-blooded1, at 27-31.

powered plants 39 percent are people of color. The National Association for the Advancement of Colored People has also found that a majority of communities of color live within three miles from a coal-powered plant, and EPA's proximity analysis of the Clean Power Plan confirms these findings. This proximity constantly exposes these communities and our members – who too often lack the economic resources to prevent adverse health outcomes – to dangerous particulate matter and ozone precursors that become dangerous lower-atmosphere ozone.

8. Our members are intimately aware of the beneficial effects of reducing air pollution on the patients they care for. For example, in Los Angeles County SEIU nurses who regularly treat young patients for asthma and bronchitis believe that the asthma rate is no longer rising in large part because state and local governments in California have limited air pollution emissions and encourage clean energy alternatives. The Clean Power Plan will result in reductions of these dangerous air pollutants nationwide.

9. SEIU also recognizes the Clean Power Plan will have significant financial benefits for our healthcare system. The EPA's analysis of the rule estimates that reduction of pollution-related illnesses will result in up to $54 billion per year of public health and climate benefits. The Clean Power Plan will also result in fiscal benefits as healthcare expenditures attributable to fossil fuel pollution decline, with positive impacts on taxpayers. It will also create good jobs for hard-working Americans in a new energy economy. To the extent a stay leads to any delay in Clean Power Plan implementation, SEIU members and the members of the communities where they work will continue to be harmed by the public health and

economic impacts of climate change and air pollution.

10. Under the final rules, states that want to obtain an extension for the submission of their final plans to 2018 must make an initial submission in September 2016 that explains how they are engaging vulnerable communities and how they will continue to involve them as they develop their final plans. This initial engagement with the communities most affected, which is not difficult for states to undertake, should commence now and should not be delayed while litigation proceeds. A stay of the final rule would cause injury to the public but particularly to those of our members that live or work close to fossil fuel-fired power plants, by precluding their opportunity to begin engagement with their state agencies on the development of their final plans for a just transition under the rule.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct.

Executed this 4th day of December, 2015 in Washington, D.C.

Mary Kay Henry

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF FERNANDO LOSADA

I, Fernando Losada, declare as follows:

1. I serve as the Director of Environmental Health and Climate Justice for National Nurses United (NNU). In my position at NNU, I coordinate the research, education, outreach and policy efforts of NNU membership on environmental and climate change issues.
2. NNU is the nation's largest union and professional association of registered nurses (RNs), with nearly 185,000 members in total and a presence in every state. NNU's primary purposes and goals include collective bargaining representation of RNs in their work places so that they may effectively

advocate for their patients; promoting safe, therapeutic nursing practice standards; and organizing RNs so that they may effectively influence public policy related to all aspects of healthcare, including the promotion of a single standard of high quality healthcare – with preventive care – for all Americans. In particular, NNU's efforts include advocacy to address environmental factors causing or exacerbating the respiratory ailments, cancers, cardiac conditions and other illnesses that are affecting our members' patients.

3. NNU's commitment to addressing climate change stems from our members' direct exposure to the harmful impacts of climate change and air pollution on their patients and community health in general. Bedside nurses observe daily the health effects of environmental pollution. They report increases in frequency and severity of respiratory diseases such as asthma, bronchitis and emphysema, and an increase in cancers and aggravation of cardiovascular illness. With the extreme high temperatures that are increasingly prevalent on a warming planet, nurses also report sharp increases in heat stroke and dehydration, both of which are sometimes fatal. The effects of air pollution can be particularly acute in pediatric patients, as they have higher respiratory rates than adults, and consequently higher exposure. However, elderly patients are also vulnerable. Nurses report that symptoms as common as

coughing and difficulty breathing can cause arrhythmias, heart attacks and other serious health impacts, especially in geriatric patients.

4. NNU has a program known as the Registered Nurse Response Network (RNRN), which prepares and deploys registered nurse volunteers to provide nursing care to victims of natural disasters. RNRN volunteers have been deployed to assist with relief efforts in the aftermath of Hurricane Katrina, Superstorm Sandy, and Typhoon Haiyan, as well as to the massively destructive forest fires that recently resulted in at least five deaths and illness and injury to many hundreds of individuals in Northern California. These catastrophic events will become more and more common in a warming climate. RNRN is actively recruiting volunteer nurses with the healthcare competencies and physical stamina required to assist with what are anticipated to be more frequent natural disasters in the coming years.
5. NNU's commitment to address climate change also stems from concern for our members. While all communities are directly exposed to the harmful impacts of climate change and air pollution, nurses are even more at risk because of occupational exposure. NNU has been very actively involved in advocating for improved workplace health and safety regulations covering nurses and other healthcare workers who are routinely at risk for exposure to infectious disease. We note with concern that increased rates of infectious

disease are emerging due to the impact of global warming on vector ecology and water quality. Any increased incidence of infectious disease in the U.S. poses a risk for all Americans but particularly for our members.

6. NNU strongly supports the Clean Power Plan. It is consistent with a resolution on environmental and climate justice passed unanimously at NNU's most recent convention by which NNU resolved, among other things, to actively support efforts to secure a new global climate agreement at the December 2015 Paris negotiations. The Clean Power Plan is an essential piece of America's contribution to global efforts to slow climate change: according to the EPA's analysis, the Clean Power Plan will reduce carbon dioxide emissions from the power sector 32% below 2005 levels by 2030. We believe that the Clean Power Plan and other programs to reduce greenhouse gas emissions in the United States are essential to mitigating the risks of catastrophic climate change and to encouraging reciprocal actions from other major emitting nations.
7. The Clean Power Plan will also provide important health benefits for communities nationwide. Among other benefits, the EPA estimates that by 2030 the Rule will avoid 3,600 premature deaths, 1,700 heart attacks, 90,000 asthma attacks and 300,000 missed days of work and school every year.

8. A stay of the Clean Power Plan would harm the interests of NNU's 185,000 members, who are first-line healthcare providers in communities across the nation and who directly experience the harmful impact of climate change and air pollution in their lives and in the communities they serve. A stay risks delaying or undermining the crucial, urgently needed climate and health benefits that the Clean Power Plan will support. As evidenced by their advocacy and adoption of formal policies in support of environmental and climate justice, NNU members strongly believe we need to act to protect our communities from climate change.

9. For the foregoing reasons, I believe that a stay of the Clean Power Plan is unjustified and would be harmful to the public interest.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 24th day of November, 2015, in Glendale, California.

FERNANDO LOSADA

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	Case No. 15-1363 et al.

DECLARATION OF DAVID KOLATA

I, David Kolata, declare as follows:

1. I am the executive director of the Citizens Utility Board ("CUB"), a statutorily authorized consumer advocate in Illinois. I started at CUB in 2001 as a senior policy analyst, moving to director of policy and government affairs in 2003. I was named executive director in September 2005.

2. I am a 1991 graduate of the University of Notre Dame. I received a master's degree in political science from the University of Toronto in 1993, and a Ph.D. in the same subject from Vanderbilt University in 2003.

3. CUB is a statutorily authorized consumer advocate in Illinois, and is charged by state law to educate and advocate for residential consumers and small businesses on energy issues. CUB is one of the largest state-based utility consumer advocacy organizations in the country, with over 100,000 members across Illinois. Since our founding in 1984, CUB has saved consumers more than $20 billion on their utility bills. While CUB actively engages in policy advocacy and appears in utility rate cases before the Illinois Commerce Commission, we also run one of the largest outreach operations in Illinois, and all of our services are free of charge to the public. CUB regularly holds events, maintains a library of free consumer guides, runs a toll-free hotline, and provides an award-winning website that features tools to help consumers save energy.

4. CUB's policy objectives include maximizing investment in energy efficiency and demand response because these are the cheapest and cleanest resources available to meet the electricity needs of consumers. In pursuit of this goal, we employ a multifaceted strategy of empowering consumers through information and technology, working to develop new markets and business models for these resources, and demonstrating policy and community leadership through collaboration and partnership. This strategic approach has

made CUB a nationally recognized expert on smart grid consumer issues and helped reduce electricity bills for Illinois consumers.

5. CUB actively collaborates with other statutorily authorized consumer advocates in other states, both informally and formally as a participating member in the National Association of State Utility Consumer Advocates ("NASUCA"). As discussed in greater detail below, analysis by this organization highlights that CUB's success in supporting energy efficiency throughout Illinois is typical of what is or could be achieved throughout the United States.

6. As a consumer advocate organization, CUB supports the EPA's efforts to reduce greenhouse gas emissions from the power sector under the Clean Power Plan. This plan will lead to significant consumer benefits in the form of reduced health impacts and welfare risks from climate change. Equally important, the Clean Power Plan affords the states significant flexibility to leverage energy efficiency and demand response to achieve the required reductions in carbon pollution – measures that will directly benefit consumers by optimizing their energy use and reducing their energy bills. CUB believes that a stay of the Clean Power Plan would risk delaying or undermining these valuable consumer benefits and severely harm the public interest. In particular, a stay would have a chilling effect in Illinois by

slowing opportunities that reduce customer energy bills and greenhouse gas emissions through the voluntary "Clean Energy Incentive Program," which will reward early action to implement energy efficiency in low-income communities.

Energy Efficiency in Illinois Saves Consumers Money

7. In 2007, Illinois passed an Energy Efficiency Portfolio Standard ("EEPS"), which requires large utilities to offer energy efficiency programs to end-users and reduce electricity consumption by 2% per year.[1] The EEPS was a marked shift in policy for Illinois, which had historically relied heavily on coal-fired generation and invested minimally in end-use energy efficiency prior to 2007. Significantly, Illinois had no prior experience with implementing state-wide energy efficiency programs prior to this program. Nevertheless, energy efficiency investments – and consumer energy savings – increased rapidly once EEPS implementation began. By only the third year of the EEPS program, over 46 billion cumulative kilowatt hours ("kWh") had been saved.[2] Now in its sixth year, savings have surpassed 76 billion kWh, equivalent to offsetting the electricity needed to power 4.7 million homes.[3]

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[1] *See* 220 Ill. Comp. Stat. 5/8-103(b).
[2] *See* Ill. Energy Efficiency Stakeholder Advisory Grp., *The Impact of Energy Efficiency in Illinois: 2008–2014* (2015).
[3] *See id.*

The program is notable for two reasons. First, it has been broadly successful, reducing carbon emissions through engaging over 2.4 million customers.[4] Second, the program has shown that it is possible to rapidly deploy energy efficiency resources in a state that previously had limited experience with the resource.

8. By reducing kWh used, installed energy efficiency saves consumers money. Indeed, our analysis has found that if we extend the lifespan of EEPS to align with the timelines in the Clean Power Plan and reach the maximum energy efficiency possible, end-users will save a total of $806 million on electric bills, assuming a medium rate of inflation (a low rate of inflation would result in $585 million in savings, whereas a high rate of inflation would result in $1,039 million).

Real-Time Pricing Saves Illinois Consumers Money

9. Illinois also has experience with real-time pricing rates, a mechanism that reduces inefficiencies in how electric supply and demand are traditionally matched for end-users. Real-time pricing rates provide end-users with rates that reflect the true cost of electricity at a given point in time, rather than an average or "flat" rate that provides little pricing transparency. These rates empower customers to reduce their energy bills by shifting their energy

[4] *See id.*

usage to periods when overall demand – and electricity prices – are relatively low. Real-time pricing rates also yield system-wide benefits for all consumers by reducing total demand at peak periods, thereby reducing prices for those consumers who do choose to use electricity at peak times. Because the power plants that meet peak demand are frequently the most inefficient and highly-emitting facilities, real-time pricing rates yield important environmental co-benefits along with reduced system costs.

10. The Illinois Commerce Commission, the regulatory body that oversees the state's utilities, has required utilities to report costs and savings from real-time pricing programs. Utility reporting indicates a marked benefit to real-time pricing rate consumers, Illinois consumers, and the grid after only a short implementation period. As the program has matured, net benefits have increased. In 2013, the program generated over $4,000,000 in net benefits for customers of the Commonwealth Edison Company, Chicago's utility.[5] In downstate Illinois, the Ameren Illinois Company expects a net benefit of over $5,913,000 through 2020 for customers in its independent system operator region.[6]

[5] *See* Klos Energy Consulting, LLC, *Updated Net Benefits of ComEd Residential Real Time Pricing Program: Final Report for Calendar Year 2013* 3 (2014)
[6] *See* Navigant Consulting, Inc., *Power Smart Pricing 2010 Annual Report* 3 (2011).

11. The real-time pricing program demonstrates that customers can save money while making the grid more environmentally friendly and efficient. This is supported by a significant Commonwealth Edison report which determined that the majority of net benefits come from two areas: customer savings (i.e., reductions in electricity bills for rate participants) and overall demand reductions (i.e., reductions in electricity prices for all end-use consumers due to reduced demand on the system during high-price hours).[7] The utilities also reported other benefits, including environmental benefits and improved customer satisfaction. [8]

12. Real-time pricing rates are only one type of time-variant tariff; others such as time-of-use rates and critical-peak-pricing rates would likely have similar beneficial impacts. We expect that programs like the Clean Power Plan will lead to greater interest in and deployment of real-time pricing programs and other types of rates that encourage consumers to conserve energy and/or use less energy at peak demand times. Based on our experience in Illinois, increased deployment of such pricing structures would lead to even greater net benefits for consumers.

[7] *See* Klos Energy Consulting, *supra* note 5.
[8] *See id.*

Illinois Grid Modernization Efforts Provide Valuable Consumer Benefits

13. Our work on energy efficiency and demand response issues recognizes that the electric sector is in the midst of profound technological change. Advances make it possible to reduce costs in new ways and are ushering in new business models for power companies.

14. Illinois's modernization efforts are reducing inefficiencies throughout the electric sector value stream – that is, energy capacity, transmission, and generation – so that less supply is needed to serve demand. This has direct cost savings for consumers in the form of reduced electric bills and a number of co-benefits as well, including significant CO_2 reductions and streamlined grid operations.

NASUCA Report Finds the Clean Power Plan Can Save Consumers Money by Using Energy Efficiency to Meet State Goals

15. Illinois consumers, the environment, and the electric grid have benefited from clean energy advances currently underway in the state. These benefits have taken root rapidly and successes continue to grow. Illinois's experience is illustrative of what is already occurring or will likely occur in other states throughout the nation. CUB is a member of NASUCA, a national organization made up of statutorily designated state consumer advocates like CUB. In 2015, NASUCA commissioned a study to determine best practices

in planning for Clean Power Plan compliance.[9] This study determined that states will have a wide range of measures available to use in complying with the Clean Power Plan, including many demand-side programs like those employed in Illinois and described above. The study found that these available options, such as new end-use energy efficiency programs and grid modernization efforts, could provide the same benefits we have seen in Illinois – that is, consumer savings in the form of reduced energy bills, as well as reduced health impacts and welfare risks from climate change.[10] In particular, the report noted that while the EPA had estimated the cost of energy efficiency at 4.5 cents per kWh in the proposed Clean Power Plan, energy efficiency would likely cost less than 3.4 cents per kWh based on studies of existing energy efficiency programs.[11]

16. CUB believes the Clean Power Plan, if implemented correctly, will have a beneficial impact upon Illinois consumers, as it supports the implementation of cost-effective, modernizing elements within the power sector. Our experience in Illinois has been that reducing emissions and energy waste is beneficial for consumers, and that a number of cost-effective opportunities

[9] *See* Rachel Wilson et al., Synapse Energy Econ., *Best Practices in Planning for Clean Power Plan Compliance* (Apr. 29, 2015), http://nasuca.org/nwp/wp-content/uploads/2013/11/NASUCA-Best-Practices-Report-3-final.pdf.
[10] *See id.* at 54.
[11] *See id.* at 28.

for doing so exist. The NASUCA report indicates that these opportunities are present not only in Illinois but throughout the nation. Conversely, a stay of the Clean Power Plan would harm ratepayers' interest by undermining and delaying energy advances that provide environmental and consumer benefits.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 4th day of December, 2015, in Chicago, Illinois.



David Kolata

United States Court of the District of Columbia Circuit

State of West Virginia, et al., Petitioners v. Environmental Protection Agency and Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	Case No. 15-1363 (and consolidated cases)

DECLARATION OF JASON C. PRICE
INDUSTRIAL ECONOMICS, INC.

I, Jason C. Price, state and declare as follows:

Purpose of this Declaration

1. I provide this declaration supporting the Opposition of American Lung Association, Center for Biological Diversity, Clean Air Council, Clean Wisconsin, Coal River Mountain Watch, Conservation Law Foundation, Environmental Defense Fund, Kanawha Forest Coalition, Keepers of the Mountain Foundation, Mon Valley Clean Air Coalition, Natural Resources Defense Council, Ohio Environmental Council, Ohio Valley Environmental Coalition, Sierra Club and West Virginia Highlands Conservancy to Motions for Stay of the Carbon Pollution Emission Guidelines for Existing Sources: Electric Utility Generating Units ("Clean Power

Plan"), published at 80 Fed. Reg. 64,662 (Oct. 23, 2015), during the pendency of this litigation.

2. My declaration explains that Petitioners' assertions that the Clean Power Plan will lead to specific company job losses within the period of time required for this Court to review the case are speculative. Similarly, the Petitioners' claim that the Clean Power Plan will lead to net, economy-wide job losses in the U.S. in this timeframe or later is also speculative. As this declaration will demonstrate in the Analysis section below, the Clean Power plan does not require any plant to close in 2016. The Clean Power Plan's emission limits do not become effective until 2022, and states have three years, until 2018 if they need the time, to prepare state plans. Because states need not yet decide how they will implement the Clean Power Plan, it is impossible to ascribe any job impacts (gains or losses) occurring during the period of this litigation to the Clean Power Plan. For this reason, it is also premature to predict what longer-term job impacts (gains or losses) the implementation of the Clean Power Plan may have. The CPP allows states a wide variety of compliance alternatives in designing their plans and the choices they make will have consequences for employment impacts. Petitioners rely on generalized claims about job losses premised on EPA's Integrated Planning Model results for one hypothetical compliance scenario, which are not representative of the compliance plans that states will actually submit to EPA in the future. Further, a number of reports that Petitioners rely on for projecting longer-term consequences were based on the *proposed* Clean Power Plan. The proposed and final Clean Power Plan differ significantly, including importantly in the start date for compliance, which is two years later in the final rule than EPA had proposed, and

therefore analysis of near term effects of the proposed rule cannot be applied to the final rule. Beyond this, Petitioners have presented the Court with no record or other evidence of job losses within the time period required for this Court to review the case.

3. I provide this declaration based on my professional experience, as outlined below, which includes a recent assessment of the economy-wide employment impacts of the U.S. EPA's proposed Clean Power Plan, a variety of other employment-related analyses for EPA, and the design of economy-wide modeling analyses of employment and other economic impacts in the U.S. and Canada.

4. As background for my preparation of this declaration, I reviewed the Clean Power Plan, the EPA's Regulatory Impact Analysis for the Clean Power Plan, and the following declarations and reports attached to Petitioners' Motions for Stay:

- Declarations of Bryan A. Galli, Exhibit A; and Harry C. Alford, Exhibit B, Peabody Energy Corp.'s Motion for Stay.
- Declarations of John L. Pemberton (Oct. 13, 2015), Exhibit B; James A. Heidell & Mark Repsher (Oct. 16, 2015) and attached report PA Consulting Group, Inc., *A Survey of Near-Term Damages Associated with the EPA's Clean Power Plan* (Oct. 16, 2015), Exhibit C; Derrick Brummett (Oct. 14, 2015), Exhibit G; Patrick F. Ledger (Oct. 14, 2015), Exhibit H; Jim P. Heilbron (Oct. 8, 2015), Exhibit M; Lisa D. Johnson (Oct. 12, 2015), Exhibit N; Michael L. Burroughs (Oct. 12, 2015), Exhibit O; Robert Frenzel (Oct. 15, 2015), Exhibit Q; R. Allen Reaves, Jr. (Oct. 13, 2015), Exhibit R; and James

J. Jura (Oct. 12, 2015), Exhibit S, Motion for Utility and Allied Petitioners for Stay of the Rule.

- Declarations of Seth Schwartz, Energy Ventures Analysis, Inc. and attached report, *Evaluation of the Immediate Impact of the Clean Power Plan Rule on the Coal Industry* (Oct. 2015), Exhibit 1; John D. Neumann, North American Coal Corporation, Exhibit 6; Robert E. Murray, Murray Energy Corporation, Exhibit 9; Jeremy Cottrell, Westmoreland Coal Company, Exhibit 10; Christopher P. Jenkins, CSX Transportation, Incorporated, Exhibit 11; Bill Bissett, Kentucky Coal Association, Exhibit 12; and R. Raney, West Virginia Coal Association, Exhibit 13, Coal Industry Motion for Stay;
- Declarations of Karen Alderman Harbert, President and Chief Executive Officer, Institute for 21st Century Energy, Exhibit 7-A; Brad Rinas, District Superintendent, Washburn Public School District, Exhibit 7-B; Luke Voigt, Business Manager, International Brotherhood of Boilermakers Local 647, Exhibit 7-C; Josh Howard, Exhibit 7-D, Declaration of Thomas E. Young, Exhibit 7-E; Kenneth E. Taylor, Exhibit 7-F; Michael D. Thompson, Exhibit 7-G; Brandt Dick, District Superintendent, Underwood Public School District, Exhibit 7-I; Hollie Blanton, Owner, Templeton Air Conditioning and Refrigeration, Mount Pleasant, Texas, Exhibit 7-J; Jeffrey Hammes, CEO and President, Industrial Contractors, Inc., Exhibit 7-K; Diana Kennedy, Realtor, Century 21 Landmark Associates, Mount Pleasant, Texas, Exhibit 7-M; and Richard Witherspoon, Chairman, Mount Pleasant

Chamber of Commerce, Mount Pleasant, Texas, Exhibit 7-N, Chamber of Commerce, et al. Motion for Stay.

I also reviewed the following studies and articles related to the Clean Power Plan's employment impacts as referenced in one or more of the declarations listed above:

- Bivens, Josh. *A Comprehensive Analysis of the Employment Impacts of the EPA's Proposed Clean Power Plan*, Economic Policy Institute Briefing Paper #404, June 9, 2015.
- Dayaratna, Kevin D. "The Economic Impact of the Clean Power Plan," Testimony before the Committee on Science, Space, and Technology, June 24, 2015.
- Godby, Robert, Roger Coupal, David Taylor, and Tim Considine. *The Impact of the Coal Economy on Wyoming*, prepared for Wyoming Infrastructure Authority, February 2015.
- Industrial Economics, Inc. and Inter-industry Economic Research Fund. *Assessment of the Economy-wide Employment Impacts of EPA's Proposed Clean Power Plan*, April 14, 2015.
- Johnson, Lisa D. "Testimony of Seminole Electric Cooperative, Inc.," Testimony before the House Committee on Energy and Commerce Subcommittee on Energy and Power, April 14, 2015.
- Lyon, John. "Utility officials: EPA rule may shut down two Arkansas power plants," Arkansas News, August 12, 2014.
- National Black Chamber of Commerce. *Potential Impact of Proposed EPA Regulations on Low Income Groups And Minorities*, June 2015.

- Texas Municipal Power Agency, Comments on "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units", Docket ID No. EPA-HQ-OAR-2013-0602, November 26, 2014
- U.S. Department of Energy, Energy Information Administration, *Analysis of the Impacts of the Clean Power Plan*, May 2015.

Experience and Qualifications

5. I am currently a Principal at Industrial Economics, Inc. ("IEc") in Cambridge, Massachusetts, where I have been employed for the past thirteen years. I specialize in the development and implementation of methods to assess the costs, benefits and economic impacts of policies and programs related to air pollution policy, climate change, and energy development and production. I have managed the development of multiple regulatory impact analyses for EPA and other agencies and have also analyzed the energy market impacts associated with changes in policy for EPA, the Department of the Interior, and other clients.

6. I graduated *summa cum laude*, with honors from Syracuse University with a B.A. in political science and international relations in 2000. I then earned a Master in Public Policy from the Gerald R. Ford School of Public Policy at the University of Michigan in 2002.

7. I have presented my work in benefit-cost analysis to EPA's Science Advisory Board and to the Society for Risk Analysis. My work is also cited in EPA's Guidelines for Preparing Economic Analysis.

8. I have researched and published extensively on the employment impacts of air pollution regulations, including, for example, *Employment Impacts Associated with the Manufacture, Installation, and Operation of Scrubbers,*[1] and *Assessment of the Economy-wide Employment Impacts of EPA's Proposed Clean Power Plan*,[2] prepared for the Energy Foundation.

9. I have also assisted EPA and other agencies on the development of methods for assessing the employment and other economic impacts of public policy. My experience in this regard includes the development of guidance for Health Canada on the conditions under which specific types of economic modeling tools are appropriate for assessing the economic impacts of air policy. I also assisted EPA with the development of data and methods for assessing the employment impacts of flue gas desulfurization systems (scrubbers) and controls for mercury emissions. Currently, I am assisting the South Coast Air Quality Management District with the development of methods for assessing small-scale and small business employment impacts.

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[1] Memorandum from Jason Price, Nadav Tanners, and Jim Neumann (IEc) and Roy Oommen (ERG) to Ellen Kurlansky, U.S. EPA Office of Air and Radiation, *Employment Impacts Associated with the Manufacture, Installation, and Operation of Scrubbers* (Mar. 2011) *available at*: http://www3.epa.gov/airtoxics/utility/scrubber_jobs_memo_3-31-11.pdf.

[2] Industrial Economics, Incorporated and Interindustry Economic Research Fund, Inc., Assessment of the Economy-wide Employment Impacts of EPA's Proposed Clean Power Plan (Apr. 2015) *available at*: http://www.inforum.umd.edu/papers/otherstudies/2015/iec_inforum_report_041415.pdf.

Through these and other efforts, I have detailed knowledge of the literature on the employment impacts of public policy.

10. My professional expertise also includes knowledge of various economic and energy models used in the assessment of environmental and energy policy. I have helped design analyses using the Integrated Planning Model (IPM) for EPA and peer reviewed IPM analyses conducted by other agencies. I also led the development of the Market Simulation model of U.S. energy markets that the Bureau of Ocean Energy Management uses to assess the energy market impacts of offshore oil and gas development. I am also familiar with and have used the reference case and alternative case forecasts generated by the National Energy Modeling System (NEMS) and have advised EPA on the methods NEMS uses to capture technological change. I have designed economic modeling analyses for the U.S. EPA, Health Canada, the Energy Foundation, and the U.S. Department of the Interior, and have also led the development of methods for incorporating the health benefits of air pollution policy into models of the U.S. and Canadian economies.

Analysis

11. I reviewed *Evaluation of the Immediate Impact of the Clean Power Plan Rule on the Coal Industry,* an unpublished report prepared by Seth Schwartz of Energy Ventures Analysis for the Coal Industry Motion for Stay (EVA Report). The EVA report claims that the promulgation of the Clean Power Plan will lead to irreparable employment losses before the litigation of the Clean Power Plan is resolved. To support this claim, Mr. Schwartz presents his interpretation of results from the IPM runs performed by EPA for the Regulatory Impact Analysis of the final Clean Power Plan. According to

Mr. Schwarz, the IPM results demonstrate that the Clean Power Plan will require certain plants to retire in 2016, resulting in widespread job losses for workers at these plants.

12. In my professional opinion, the statements made in the EVA Report, misinterpret and mischaracterize the IPM runs conducted by EPA. I have reviewed the declarations of Dr. Susan Tierney and Drs. Dallas Burtraw and Joshua Linn, and for the reasons they state therein, it is a misuse of the IPM model to assert that the model results require any coal plants to close in 2016 or 2017, five to six years before any Clean Power Plan emission limitations take effect.

13. The EVA Report also ignores the fact that states have not yet written, much less implemented, plans to comply with the Clean Power Plan. States may choose among a variety of potential compliance strategies, and well after the period of this litigation, their eventual choices may influence job gains or losses as the Clean Power Plan is implemented. As discussed in the Tierney and Burtraw/Linn declarations, within the framework of the Clean Power Plan, states will have many options for avoiding or deferring coal plant retirements, including selecting a glide path that shifts emission reductions later in time. Moreover, plans that permit sources to engage in emissions allowance or credit trading across state lines will allow sources greater flexibility to access least-cost emission reduction opportunities, further influencing job impacts. In sum, because implementation will occur only after states develop their plans and because states have so many potential compliance options, there is no support for linking near-term job impacts to the Clean Power Plan. It is therefore

premature to definitively predict the employment impacts of the Clean Power Plan occurring over the next decade.

14. I also reviewed *A Survey of Near-Term Damages Associated with the EPA's Clean Power Plan* by James Heidell and Mark Repsher at PA Consulting, an unpublished report prepared to support the Motion for Utility and Allied Petitioners (PA Consulting report). The PA Consulting report claims the Clean Power Plan will lead to immediate employment losses in the electric power, coal mining, and manufacturing sectors, based on the findings of several third-party sources (discussed immediately below). In my professional opinion, the statements made in the PA Consulting report regarding the near-term employment impacts of the Clean Power Plan are incorrect and without any reasonable foundation. They do not reflect several important details of the third-party studies referenced in the report and, in some cases, the third-party studies themselves are flawed.

15. The PA Consulting report cites a study on which I was a co-author, entitled *Assessment of the Economy-wide Employment Impacts of EPA's Proposed Clean Power Plan*. Our work was a study of the *proposed* Clean Power Plan, not the final rule. PA Consulting cites our work for the proposition that "the CPP would lead to the loss of 8,000 coal generation jobs due to early plant retirements." The PA Consulting Report does not report the period covered by these projections. In fact, our study did not predict any job losses before 2020 i.e., during the pendency of this litigation, even for the proposed rule, which had an earlier compliance date than the final rule, as discussed above. Moreover, our study showed net job *gains* in 2020. These results do not support inferences regarding the Clean Power Plan's employment impacts prior to

2020. Moreover, the final Rule's emission limits begin in 2022 instead of 2020 and phase in more gradually than under the proposal. For these reasons, any employment impacts (positive or negative) suggested in our report on the Clean Power Plan proposal would be deferred in time under the final Rule, and would be even farther removed from the period of this litigation. Additionally, the final Clean Power Plan, unlike the proposal, does not require formal, up-front agreements between states wishing to use trading as a compliance strategy. Instead, the final Clean Power Plan allows states to give power plants the option of meeting emission rate goals by purchasing emissions credits on the open market. Due to this greater flexibility for trading, the plans developed by states under the final rule may preserve more existing coal capacity relative to plans that would have been developed under the proposed Clean Power Plan. This is another reason employment impacts in an analysis of the proposed rule are simply not predictive of employment impacts under the final Clean Power Plan.

16. The PA Consulting report also references another study of the *proposed* (not the final) Clean Power Plan, that was conducted by the Economic Policy Institute ("EPI").[3] Specifically, PA Consulting cites the EPI study as support for the assertion that there will be job losses in the near term in electricity generation, transmission, and distribution, in coal mining, and indirect job losses associated with impacts to the mining and electric generation, transmission, and distribution industries. But PA Consulting's report does not consider several important details related to the EPI's

[3] Josh Bivens. *A Comprehensive Analysis of the Employment Impacts of the EPA's Proposed Clean Power Plan*, Economic Policy Institute Briefing Paper #404. June 9, 2015.

results and methods. In particular, the EPI study assessed the potential impact of the proposed rule, which would have taken effect in the year 2020. Under a similar analysis of the final Clean Power Plan, these impacts would likely be shifted back to 2022, if they in fact occur at all. PA Consulting's report certainly does not demonstrate that the job impacts in the EPI study would be realized in the period while the Clean Power Plan is being litigated.

17. The PA Consulting report asserts that the Clean Power Plan will lead to the loss of 41,000 manufacturing jobs between 2016 and 2019, based on Congressional testimony by Kevin D. Dayaratna of the Heritage Foundation. However, a review of Dr. Dayaratna's testimony,[4] shows that he predicted job *gains* in 2015 and 2016 (a 286-job gain in manufacturing employment in 2015 and 2,138 additional jobs in 2016). However, like the studies discussed above, the EIA analysis that served as the basis for Dr. Dayaratna's Congressional testimony considered the proposed Clean Power Plan, not the final Clean Power Plan.[5] Because the final Clean Power Plan differs from the proposed Clean Power Plan, as described above, the estimated employment impacts of the proposed rule are not predictive of what will happen when the final Clean Power Plan is implemented. Further, the EIA analysis Dr. Dayaratna relied on in his testimony uses the National Energy Modeling System, which is not a state-level

[4] Kevin D. Dayaratna, Ph.D., Senior Statistician and Research Programmer, The Heritage Foundation, Testimony before the U.S. House of Representatives, Committee on Science, Space and Technology, June 24, 2015, *available at*: http://www.heritage.org/research/testimony/2015/the-economic-impact-of-the-clean-power-plan.

[5] U.S. Energy Information Administration, *Analysis of the Impacts of the Clean Power Plan*, May 2015.

model and instead models electricity markets for 21 regions. As stated in the EIA analysis, "The regional compliance patterns presented in this analysis are model outputs from NEMS, while actual compliance mechanisms will be defined by state compliance proposals and may have different characteristics." Thus, in my professional opinion, the EIA analysis cannot be used to predict that the Clean Power Plan will cause near-term employment effects.

18. PA Consulting cites a state-level (Wyoming) study[6] estimating that the Clean Power Plan will lead to the loss of 7,000 jobs in Wyoming in 2025 – a period well beyond this litigation. Also, like many of the studies referenced in the PA Consulting report, the Wyoming study focuses on potential impacts of the proposed Clean Power Plan rather than the final Clean Power Plan.

19. Further, the estimate of 7,000 lost Wyoming jobs in 2025 is fundamentally flawed because of improper specification of baseline conditions (i.e., conditions without the Clean Power Plan). As stated on page 92 of the Wyoming study, "the imposition of the proposed EPA regulations results in a loss of over 7,000 jobs by 2025 compared to 2012." When estimating the economic effects of a regulation in a given future year (e.g., employment impacts in 2025), the correct baseline is the state of the world expected in that same year without the regulation. Thus, rather than comparing 2025 employment with the Clean Power Plan to 2012 employment, the Wyoming study, to be accurate, should have compared 2025 employment with the

[6] Robert Godby, Roger Coupal, David Taylor, and Tim Considine. *The Impact of the Coal Economy on Wyoming*, prepared for Wyoming Infrastructure Authority, February 2015.

Clean Power Plan to 2025 employment without the Clean Power Plan. Employment in 2012 cannot be assumed to be an accurate predictor of employment in 2025 without the Clean Power Plan. For example, there are many reasons why employment in the coal sector has varied over time, as discussed in the Wyoming study[7] – reasons that have nothing to do with the Clean Power Plan. These include fluctuations in coal demand and changes in mine efficiency (i.e., the number of miners required to produce a given amount of coal).

20. PA Consulting also makes job loss claims that are entirely derivative of claims by Schwartz, namely that the Clean Power Plan will cause specific plants to close in 2016. As discussed in the declaration of Drs. Dallas Burtraw and Joshua Linn and the declaration of Dr. Susan Tierney, there is no reasonable basis for concluding that these plants will be forced to close in 2016 by EPA's IPM modeling results. As a result, PA Consulting's projected employment losses have no rational foundation.

21. PA Consulting's report suggests that the recent closures of several coal-fired power plants, and associated job dislocations, are indicative of employment losses likely to occur in the near future as a result of the Clean Power Plan. In my professional opinion, recent plant closures were not caused by the Clean Power Plan and provide no proof that the Clean Power Plan will cause other near-term plant closures. The closures to which PA Consulting alludes occurred for a number of reasons unrelated to the Clean Power Plan, including the downward trend in natural gas prices and the expectation that natural gas will continue to be relatively inexpensive for several years or decades.

[7] *Id. at 20.*

22. PA Consulting also contends that reduced coal demand associated with the Clean Power Plan will lead to a reduction in railroad revenues and that this decline would lead to job losses for railroad employees. The assertion that the Clean Power Plan will cause a decline in near-term railroad coal shipments is purely derivative of the claim that the Clean Power Plan will cause the near-term closure of specific coal-fired power plants. Since that claim is not supported, the asserted impacts on railroads also lack a foundation.

23. I also reviewed other declarations submitted by representatives of individual companies or industry associations claiming that the Clean Power Plan would lead to job losses. In my professional opinion, these claims of job losses are unsubstantiated. Many are based on EPA's IPM runs for the Clean Power Plan; others make claims of job losses without providing supporting data; and some do not consider the ways in which declarant businesses have modified their operations over time to prevent employment impacts.

24. I reviewed the declaration of Bryan A. Galli of Peabody Energy Corporation. Based on EPA's IPM modeling of the Clean Power Plan, Mr. Galli asserts that the Clean Power Plan will result in the closure of Peabody's Powerton Generating Station. As I describe above, EPA's IPM runs for the Clean Power Plan do not represent a reasonable basis for predicting the near-term employment impacts of the rule.

25. I reviewed the declaration of Harry C. Alford of Peabody Energy Corporation. Mr. Alford's declaration claims that the Clean Power Plan will result in 7 million cumulative job losses for African Americans and 12 million for Hispanics. Mr. Alford bases his statements on a compilation of third-party studies reviewed in an

unpublished study entitled *Potential Impact of Proposed EPA Regulations on Low Income Groups and Minorities*, prepared for the National Black Chamber of Commerce prior to the finalization of the Clean Power Plan (National Black Chamber report). The National Black Chamber report presents estimates of Clean Power Plan employment impacts for the year 2020. Because 2020 is five years from now, these estimates are not indicative of employment impacts realized during the current litigation of the Clean Power Plan. This report – like other studies of the proposed Clean Power Plan – simply has no bearing on the impacts of the final rule, which differs in timing and stringency from the proposal.

26. Moreover, when I reviewed that work, I found that many of the third-party studies that the National Black Chamber report relies upon to generate employment estimates for the Clean Power Plan do not focus specifically on the Clean Power Plan at all, and in some cases predate the release of the proposed rule by several years. For example, the third-party studies relied upon include the following, none of which are specific to the Clean Power Plan:

- "Energy Market Impacts of Recent Federal Regulations on the Electric Power Sector," by Energy Ventures Analysis. November 2014.
- "EPA Power Plant Regulations: A Backdoor Energy Tax," by the Heritage Foundation, December 5, 2013.

"The Effect of CO2 Emissions Reduction on the U.S. Electricity Sector," by the International Trade Commission of the U.S. Department of Commerce, May 2011.

Because these studies do not focus on the Clean Power Plan, the employment impacts estimated by these studies are not informative of Clean Power Plan impacts.

27. Declarations submitted by the following individuals also include erroneous or misleading claims of job losses associated with the Clean Power Plan based on IPM runs performed by EPA: John L. Pemberton of Georgia Power, Jim P. Heilbron of Alabama Power, Michael L. Burroughs of Gulf Power, R. Allen Reaves Jr. of Mississippi Power, Brad Rinas of Washburn Public School District, Brandt Dick of Underwood Public School District, Hollie Blanton of Templeton Air Conditioning and Refrigeration, Diana Kennedy of Century 21 Landmark Associates, Richard Witherspoon of Mount Pleasant Chamber of Commerce, Jeffrey Hammes of Industrial Contractors, Inc., Luke Voigt of the International Brotherhood of Boilermakers, Jeremy Cottrell of Westmoreland Coal Company, John D. Neumann of The North American Coal Corporation, Robert E. Murray (Murray Energy Corporation), Karen Alderman Harbert of the Institute for 21st Century Energy. As I describe above, the Clean Power Plan imposes no requirements before 2022 and EPA's IPM runs do not require any plants to close in 2016. Thus, none of the near-term employment claims in these declarations has a reasonable foundation.

28. I also reviewed the declarations submitted by Kenneth E. Taylor of Ohio CAT, Patrick F. Ledger of Arizona Electric Cooperative, Derrick Brummett of San Miguel Electric Cooperative, Michael D. Thompson of Thompson Tractor, Josh Howard of Aquatic Resources Management, and Thomas E. Young of Hilltop Energy. Each of these declarants states that their respective organizations would experience job losses as a result of the Clean Power Plan, but none provides any analysis or data supporting

that claim. In fact, Mr. Young describes how his firm has successfully transitioned to new markets and kept the size of its workforce unchanged as its coal market has declined. This information would suggest that Mr. Young's firm, Hilltop Energy, may not experience any job losses as a result of any changes in coal production that may in the future be associated with the Clean Power Plan.

29. Declarants Robert Frenzel of Luminant, James J. Jura of the Associated Electric Cooperative, and Lisa D. Johnson of Seminole Electric Cooperative also maintain that their respective organizations will experience job losses as a result of the Clean Power Plan. These claims, however, do not substantiate near-term job losses or, with respect to the longer term, reflect the full range of implementation options available to states.

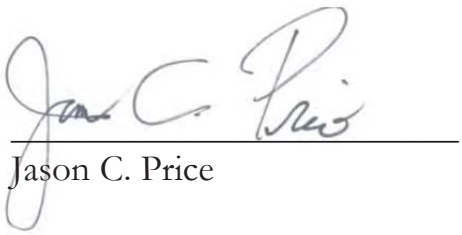
30. As mentioned at paragraphs 8 and 15 above, I am a co-author of the *Assessment of the Economy-wide Employment Impacts of EPA's Proposed Clean Power Plan.* I turn now to a review of our study, in order to point out that in the period beginning in 2020 (the period covered by the proposed Rule) our study projected *sizable net gains* in employment. Using a macro-econometric model of the U.S. economy, we estimated the employment and gross domestic product impacts of the proposed Clean Power Plan. The study was designed to expand upon EPA's regulatory impact analysis and capture a multitude of direct and indirect economic impacts associated with the proposed Clean Power Plan. In particular, the study captured several indirect effects not incorporated into EPA's analysis including: employment impacts associated with changes in electricity and other energy prices, the productivity associated with heat rate improvements at power plants, households and businesses re-directing

expenditures to other uses because of increased demand-side energy efficiency, expenditures crowded out by energy efficiency expenditures, and changes in investments for air pollution control devices.

31. Based on these effects and those captured by EPA in its Regulatory Impact Analysis for the proposed rule, our study estimated that the proposed Clean Power Plan would result in a *net gain* of approximately 74,000 jobs in 2020 and projected that these annual employment gains would *increase* to 196,000 to 273,000 jobs between 2025 and 2040. In no study year between 2020 and 2040 did the analysis suggest a net loss of jobs. The study cautions that many factors affect employment, rendering it difficult to estimate employment impacts from the Clean Power Plan. Estimating these employment impacts is especially difficult prior to states indicating which of the numerous and diverse compliance measures they intend to utilize in their implementation of the rule. Despite this uncertainty with respect to the compliance measures that states include in their implementation plans, our study demonstrated that policies designed to limit CO_2 emissions from electricity generators could lead to gains in employment. In my professional opinion, the potential net job gains from the Clean Power Plan will be delayed if the grant of a stay delays the submission of state compliance plans and implementation of the regulations.

I declare under the penalty of perjury under the laws of the United States, that to the best of my knowledge, the foregoing is true.

Executed on December 7, 2015, at Cambridge, Massachusetts.



Jason C. Price

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF DELVAN WORLEY

I, Delvan Worley, hereby state and declare as follows:

1. I am CEO of Holy Cross Energy ("Holy Cross"), a rural electric cooperative (or "co-op") with its headquarters in Glenwood Springs, Colorado. I have been CEO of Holy Cross for 8 years. I have 35 years of experience in the electric utility industry, of which 12 years were with a generation and transmission rural electric cooperative and the remainder with Holy Cross. I hold a Bachelor of Science in Applied Mathematics from Colorado State University. I submit this declaration on behalf of Holy Cross and in support of the oppositions to the motions to stay the Clean Power Plan in the above-captioned case.

2. Holy Cross, formed in 1939, is a not-for-profit, member-owned electric cooperative utility providing electricity, energy products and services to more than 43,000 consumers, with 55,000 meters, in the Western Colorado Counties of Eagle, Pitkin, Garfield, Mesa, and Gunnison.

3. Holy Cross supplies its customers primarily through long-term power supply commitments, the majority of which are met with coal-fired generation resources. Holy Cross has long-term power supply commitments through contracts with Public Service Company of Colorado (a subsidiary of Xcel Energy) and Western Area Power Administration. Additional wholesale resources include purchases from Black Hills Power and several small renewable energy generation facilities within Holy Cross's service territory. Holy Cross is an 8% owner of Comanche Unit 3, a 750 MW super-critical, coal-fired generating unit located in Pueblo, Colorado which became operational in July of 2010. The portfolio of resources used to serve Holy Cross's customer load in 2014 was composed of: 61.7% coal; 15.9% natural gas; 20.3% clean and renewable sources such as wind, solar, hydroelectric, biomass, and coal mine methane generation; and, 2.1% market purchases which could not be identified with a high level of certainty.

4. Holy Cross has made substantial progress in recent years to reduce the carbon intensity of the electricity we supply to our customers. The carbon intensity of Holy Cross's portfolio in 2014 was 1,570 pounds of carbon dioxide (CO_2) per megawatt hour (lb/MWh), a reduction of nearly 19% from 2012 levels and our lowest carbon intensity (by a significant margin) since we began tracking it in 2005. In addition, the total CO_2 emissions attributable to Holy Cross's portfolio in 2014 (approximately

916,400 short tons) were about 4.1% lower than 2005 levels while sales were 14.5% higher.

5. In addition, over the past 3 years, Holy Cross has invested $4.7 million on energy efficiency programs, which have enabled us to reduce member demand for electricity by approximately 2%.

6. Moving forward, Holy Cross's Board of Directors has set goals of reaching 30% clean, renewable generation by 2020 and 35% by 2025. In addition, Holy Cross has an established goal of meeting or exceeding the targets of the Clean Power Plan. Given our success in recent years in incorporating renewable energy and energy efficiency into our portfolio, we believe that these are achievable goals that will not compromise our mission, which is to provide the best possible services at a reasonable and competitive cost consistent with sound business and environmental practices.

7. Holy Cross believes a stay of the Clean Power Plan would not serve the long-term best interests of our members for the following reasons:

a. Holy Cross's members support the Clean Power Plan's goals of reducing carbon dioxide emissions from the power sector, as well as the suite of clean energy and energy efficiency solutions that can help achieve those goals. Our members have consistently shown support for a transition to a higher percentage of renewable energy in our portfolio, and we have been able to incorporate additional renewable resources into our portfolio while still providing electricity at a reasonable and competitive cost.

b. Investments in new, clean power generation are useful even outside of the requirements of the Clean Power Plan. We believe a meaningful and measured move towards renewable energy will have a stabilizing effect on our long-term power costs by helping to build a diversified power supply, less reliant on volatile fossil fuel prices.

c. The probability of severe climate change is ever increasing and the sooner progress can be made on reducing greenhouse gases the more likely we can reduce that probability. Holy Cross intends to move forward with its internal goals, discussed in point 6 above, with or without the Clean Power Plan. However, climate change is not a problem that can be solved on the local level alone. National policies such as the Clean Power Plan, involving all power producers, are the best path forward to move towards meaningful results.

d. Holy Cross's internal goals, discussed in point 6 above, will produce similar outcomes for Holy Cross as the Clean Power Plan.

e. Holy Cross also seeks to ensure that a sustainable power supply benefits our customers, and as such, Holy Cross is actively committed to serving our low income membership, which is roughly equivalent as a percentage to rural areas throughout Colorado. Holy Cross currently allocates approximately $2/meter/year (averaged over our entire customer base) in support of conventional state and federal assistance programs, and we are exploring more comprehensive and low cost solutions to potentially incorporate energy efficiency, community renewable energy, prepaid energy, leveled billing, budget counseling and low cost financing. Holy Cross believes that such

mechanisms—in addition to the overall steady downward trend in renewable energy costs—can help us continue to provide affordable electricity to our low-income members under the Clean Power Plan.

f. The Clean Power Plan is an important and achievable step towards a lower-carbon electricity supply. It provides a flexible framework to move toward a more sustainable energy supply nationwide. If utilities utilize all of the compliance pathways at their disposal, they should be able to accomplish the Clean Power Plan's goals. Given the long lead-time until the Clean Power Plan's initial compliance period in 2022, we believe that one compliance strategy could be emphasizing energy efficiency and small-scale, community, or other distributed generation. Holy Cross believes that a stay of the Clean Power Plan is not justified and would harm the public interest by putting at risk vital reductions in carbon pollution from the power sector, and these reductions are an important step in mitigating the risks of severe climate change.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed this 3rd day of December, 2015.



Delvan Worley

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF TARENCE RAY

I, Tarence Ray, declare as follows:

1. I am a field coordinator at Appalachian Voices, based in Eastern Kentucky, where I work with residents of Central Appalachia who have been affected by the environmental impacts of surface mining and mountaintop removal coal mining. I conduct water monitoring around the homes and streams of communities that are near strip mines. I also work to connect residents with the proper state regulatory agencies, and elevate their voices in the regional and national media when agencies fail to provide proper assistance or recourse. Many residents live below the poverty line, and therefore do not have access to affordable legal resources, and part of my job is helping them a) identify their specific problem and b) connect them with available legal resources.

2. Appalachian Voices is a nonprofit organization dedicated to protecting central and southern Appalachia. Appalachian Voices works to end mountaintop

removal coal mining; help communities in Central Appalachia transition away from coal and diversify their economies; address water quality issues and fight toxic coal ash in Appalachian communities; promote energy efficiency and clean energy to reduce carbon emissions; and oppose fracking and the expansion of natural gas infrastructure in the region.

3. I was born in Lubbock, Texas, and raised in the rural oilfields of southeastern New Mexico. My father works in the oil industry as the manager and owner of an oilfield supply company. The socio-economic similarities between my home region and the coalfields of Central Appalachia brought me to Eastern Kentucky three years ago. Prior to my work at Appalachian Voices, I worked two terms as an Americorps Volunteer in Service to America ("VISTA") in Letcher County, Kentucky, focusing on water quality, economic development, mine safety, and environmental justice issues. In that position, I worked with the Appalachian Citizens' Law Center, conducting outreach to miners about the federal black lung benefits program. Black lung disease, a debilitating pulmonary disorder caused by coal mine dust inhalation, is on the rise, and I witnessed first-hand how coal mining affects low-income residents in the region. I am personally familiar with the facts stated in this declaration and, if called upon, would competently testify to them.

4. The purpose of this declaration is to provide information relevant to the pending motions for stay of the Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

5. Declarants for the National Mining Association assert that the Clean

Power Plan will cause premature coal plant retirements and the loss of well-paying jobs in the coal mining industry. Declarants also assert that coal has numerous benefits, including tax revenues in poor communities in Kentucky and income for these communities in the form of coal severance taxes (Bissett Decl. ¶¶ 5, 6). As I describe below, the terrible toll that coal has on the health, living conditions, and environment in coal communities by far outweighs the benefits the Declarants cite.

6. Declarants ignore the enormous health harms that coal inflicts on mine workers and other members of their communities. Local economies' reliance on coal for decades has taken a huge toll on miners' health. I have seen firsthand the adverse public health effects that black lung disease causes on those workers in Eastern Kentucky who still mine coal for a living.

7. Affordable Care Act amendments to the 1969 Coal Mine Safety Act, which provides compensation to miners disabled by black lung and their survivors, established a presumption of total disability if a miner has worked in coal mines for at least 15 years. Last year, researchers at the National Institute of Occupational Safety and Health found that the rate of the most severe form of black lung among Appalachian coal miners has resurged to levels last seen 46 years ago.[1] One black lung victim described the disease to me as "smothering to death" over a span of many years, and another becomes so debilitated by fits of coughing that his family often fears for his life.

8. The coal industry has dominated the economy in Appalachia for more than a century, but the industry has been in economic decline for several years. From

[1] David J. Blackley and Cara N. Halldin, *Resurgence of a Debilitating and Entirely Preventable Respiratory Disease among Working Coal Miners*, American Journal of Respiratory and Critical Care Medicine, Vol. 190, No. 6, September 15, 2014.

the economic perspective, for various reasons coal no longer provides the jobs it used to. Decades ago, mechanization resulted in fewer workers being needed to mine coal. Then more easily accessible reserves were greatly diminished, and other energy sources became competitive.

9. Coal's monopoly in Appalachia has not resulted in the economic benefits that Declarants allege, as mining companies have not invested in many of the communities where their workers live. A 2013 report on the "State of American Well-Being" ranked Kentucky's Fifth Congressional District last in a "well-being" index of 434 districts based on life evaluation, emotional health, work environment, physical health, healthy behaviors, and basic access to healthcare.[2]

10. The Clean Power Plan requires states to engage all stakeholders as they develop their plans. In the final rule, EPA recognized that stakeholders include unions, their workers, and communities. States that want to obtain an extension for submitting their final plans in 2018 must make an initial submittal in September 2016 that explains how they are engaging stakeholders and how they intend to ensure their continued involvement as they develop their final plans.

11. The Clean Power Plan is expected to create thousands of new jobs in clean energy industries. The Obama Administration's proposed POWER+ Plan, discussed in the final rule, will provide a just transition for workers and their communities away from coal into a clean energy economy. One portion of the POWER+ Plan, the POWER

[2] Gallup-Healthways Well-Being Index, *State of American Well-Being. 2013 State, Community, and Congressional District Analysis*, *available at* http://cdn2.hubspot.net/hub/162029/file-610480715-pdf/WBI2013/Gallup-Healthways_State_of_American_Well-Being_Full_Report_2013.pdf .

Initiative, has already begun, and federal authorities have announced $6 million in federal funding for communities in Eastern Kentucky to help communities retrain workers and create jobs in new sectors. EPA is also encouraging states to train affected workers and provide economic development assistance to their communities.

12. Communities in central Appalachia have expressed a desire to diversify their communities away from the mono-economy of coal. Resolutions in support of the Power+ Plan have been passed in counties and communities all across the coalfields.

13. Communities in coal country would be harmed if the rule is stayed. The initial state plan submittal process provides workers and other members of our communities the opportunity to advocate for needed federal and state financial assistance and specific programs to enable the transition to clean energy that will allow the diversification of our economies, create good jobs, and improve our health and livelihoods in the face of coal's decline.

14. For the foregoing reasons, I believe that a stay of the Clean Power Plan is unjustified and would be harmful to the public interest.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 7 day of December, 2015 in Whitesburg, Kentucky.

Tarence Ray 12/7/15

Tarence Ray

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)	Case No. 15-1363 (and consolidated cases)

DECLARATION OF ROBERT BULLARD, PH.D.

I, Dr. Robert Bullard, declare as follows:

1. I am the Dean of the Barbara Jordan-Mickey Leland School of Public Affairs at Texas Southern University in Houston, a position I have held for the past four years. I have held teaching positions in the environmental justice field at Clark Atlanta University; the University of California, Los Angeles; the University of California, Riverside; and at the University of Tennessee, among other academic positions. My academic career spans 39 years. I have been a scholar and a civil rights and environmental justice advocate for almost four decades, and have been described as the "father of environmental justice."

2. I hold a Ph.D. in Sociology from Iowa State University, an M.A. in Sociology from Atlanta University, and a B.S. in Government from Alabama A&M University. I am a member of the American Sociological Association and the American

Public Health Association.

3. I have authored numerous books and journal articles on environmental racism, industrial facility siting, climate justice, disaster response, sustainable development, smart growth, urban land use, housing, transportation equity, community reinvestment, and regional equity. In 1991 I played a key role in organizing the First National People of Color Environmental Leadership Summit, which adopted the seventeen "Principles of Environmental Justice" that have served as a defining document for the growing grassroots environmental justice movement. In my capacity as chair of the Health and Research Subcommittee of the National Environmental Justice Advisory Council ("NEJAC"), I was part of the team advising President Clinton in 1994 to sign the historic "Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which requires every federal agency to assess any disproportionate impacts from their actions on minority, low-income, and indigenous communities.[1]

4. I have testified as an expert witness and served as a technical advisor in hundreds of civil rights lawsuits and public hearings over the past three decades. As a result of my extensive career as an environmental justice academic and advocate, I am personally familiar with the facts stated in this declaration and, if called upon, would competently testify to them.

5. The purpose of this declaration is to provide information relevant to the

[1] Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 16, 1994, available at http://www2.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice .

pending motions for stay of the Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan"). Harry C. Alford, President and Chief Executive Officer ("CEO") of the National Black Chamber of Commerce and declarant for Peabody Energy Corporation ("Mr. Alford"), asserts that the Clean Power Plan will have "highly damaging and irreparable impacts" on African-American communities, Alford Decl. ¶ 4; that this "proposed [sic] regulation for GHG emissions from existing power plants is a slap in the face to poor and minority families;" and that these "communities already suffer from higher unemployment and poverty rates compared to the rest of the country, yet the EPA's regressive energy tax threatens to push minorities and low-income Americans even further into poverty," id. ¶ 5.

6. Based on my years of working with minority groups, it is my opinion that Mr. Alford's views do not represent those of the majority of African-Americans or the African-American business community at large. African-Americans were an essential force in the creation of the United States' environmental and climate justice movements, because our communities have historically been disproportionately affected by harmful pollution from industrial sources, including electric power plants. Contrary to Mr. Alford's assertions, a stay of the Clean Power Plan would create significant and long-lasting harm to African-American communities.

7. The report "Potential Impact of Proposed EPA Regulations on Low Income Groups and Minorities,"[2] commissioned by the National Black Chamber of

[2] National Black Chamber of Commerce, Potential Impact of Proposed EPA Regulations on Low Income Groups and Minorities, prepared for the National Black Chamber of Commerce by Management Information Services, Inc., June 2015, available at

Commerce and published prior to EPA's issuance of the final Clean Power Plan, forms the basis of Mr. Alford's declaration. It implies that African-American communities reject action on climate and clean air safeguards. The opposite is true. Several of our most prestigious organizations and institutions, including our civil rights organizations, such as the National Association for the Advancement of Colored People ("NAACP") and the Little Village Environmental Justice Organization ("LVEJO"),[3] our churches and faith-based groups, and our historically black colleges and universities ("HBCUs") are at the forefront of the fight for climate and energy justice.

8. The environmental justice movement has made much progress during the more than two decades since Executive Order 12898 has been in effect.[4] Today, hundreds of environmental justice treatises cover a wide range of disciplines; environmental justice curricula are available in every college in the country; there are dozens of environmental justice research centers and clinics in universities; and all 50 states and the District of Columbia have established environmental justice legislation, regulations or policies. A growing number of scholars, policy analysts, and community leaders are demanding that environmental justice be made a centerpiece of climate and energy policies. The number of environmental groups led by people of color has grown from 300 groups in 1992 to more than 3000 in 2014, and the climate justice movement

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http://nbccnow.org/wp-content/uploads/2015/06/Minority-Impacts-Report-June-2015-Final.pdf .

[3] National Association for the Advancement of Colored People, et al., Coal Blooded. Putting Profits Before People, available at http://www.naacp.org/page/-/Climate/CoalBlooded.pdf .

[4] Robert Bullard et al., Environmental Justice Milestones and Accomplishments: 1964-2014, Barbara Jordan-Mickey Leland School of Public Affairs, Texas Southern University, February 2014.

is rapidly expanding.

9. Despite these successes, much work remains to be done. Research shows that race and place impact quality of life. Zip codes continue to be one of the most important indicators of an individual's health, and race is the most important predictor of locally unwanted land uses.[5] As climate change intensifies, the most vulnerable populations will suffer the most damaging impacts given where they live, their limited incomes, and their lack of access to health care. Climate change will worsen existing inequalities in our country unless appropriate policies are taken to mitigate its effects or adapt to them.

10. The Clean Power Plan provides a historic opportunity for the enactment of just laws and regulations that address longstanding disparities, in compliance with Executive Order 12898. The Clean Power Plan will not only enable our communities to transition toward clean energy; it will also set a precedent on how to integrate environmental justice into rule making and its implementation, both at the federal and state levels of government.

11. Power plants are the largest source of carbon dioxide emissions in the country, making up almost 40 percent of all domestic greenhouse gas emissions. Power plants emit other harmful air pollutants, including sulfur dioxide, fine particulate matter, and nitrogen oxide, pollutants that trigger asthma attacks and increase the risk of emergency room, hospital visits, and even premature death. They also emit mercury, a neurotoxin that has been shown to cause neurological damage in children exposed in the

[5] Robert Bullard et al., Environmental Health and Racial Equity in the United States Building Environmentally Just, Sustainable, and Livable Communities, American Public Health Association, 2011.

womb and during early development. Power plants also produce toxic wastes, including arsenic, chromium, and cadmium that can contaminate drinking water supplies and damage vital human organs and the nervous system.

12. The Clean Power Plan will save lives. Cleaning up the toxic and dangerous pollution from these plants will benefit our communities, states, and the country. Nationwide, EPA has estimated that in 2030, these long overdue protections will avoid up to 3,600 premature deaths; 90,000 asthma attacks in children; 1,700 heart attacks; 1,700 hospital admissions; and 300,000 missed school and work days.

13. The Clean Power Plan's numerous benefits will affect minority communities in particular. In 2013, African Americans were three times more likely to die from asthma-related causes than whites. From 2003 to 2005, African-American children suffered from death rates seven times that of white children. In addition, African-American children are three times more likely to be admitted to the hospital for asthma, as compared to white children.[6]

14. The location of power plants has disturbing environmental justice implications. Coal plants are often found in areas with high proportions of minority and low-income communities that are disproportionately affected by the dangerous pollutants emitted by fossil fuel combustion. According to the 2002 report "Air of Injustice," 68 percent of African Americans lived within 30 miles of a coal-fired power plant, the distance within which the maximum effects of the smokestack plume are expected to occur. The report found that populations living below the poverty line in

[6] U.S. Department of Health and Human Services, Office of Minority Health, Asthma and African Americans, available at http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlID=15 .

the same ZIP codes as a coal plant was 20 percent higher than would be expected based on state averages. Over 35 million American children were living within 30 miles of a power plant, of which an estimated 2 million are asthmatic.[7]

15. In the Clean Power Plan, the EPA performed a proximity analysis, which provides detailed demographic information on the communities located within a three-mile radius of each affected power plant within the United States. The analysis shows a higher percentage of minority and low-income communities living near power plants when compared to the national averages, and constitutes a first step for analysis of the impacts of power plants on specific populations. The EPA is also encouraging states to conduct their own environmental justice analyses as they develop their state implementation plans.

16. The Clean Power Plan also requires states to ensure meaningful participation from minority and low-income communities as they develop their implementation plans. States seeking extensions for submission of their final plans to the EPA in 2018 must, in a submittal due in September 2016, show they are engaging communities and explain how that participation will continue as final plans are developed.

17. A stay of the Clean Power Plan would harm African-American communities. To the extent that a stay leads to a delay in the rule's compliance period, African-American communities will continue to be harmed by the impacts of climate change and the pollution fossil fuel-fired plants emit.

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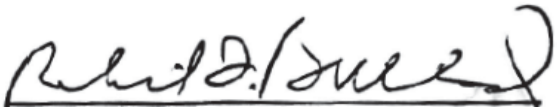
[7] The Black Leadership Forum et al., Air of Injustice. African Americans & Power Plant Pollution, October 2002, available at http://www.energyjustice.net/files/coal/Air_of_Injustice.pdf .

18. A stay of the Clean Power Plan would harm African-American communities even if such a stay did not lead to a delay in the rule's compliance period. The initial plan submittal process is a mechanism for African-American communities to advocate for the development of robust environmental justice analyses of state implementation plans, and to ensure that plans provide for absolute emission reductions in and near those communities. A stay would also impair the precedential role the Clean Power Plan can play in ensuring that state implementation of federal rules requires the meaningful participation of communities.

19. For the foregoing reasons, I believe that a stay of the Clean Power Plan is unjustified and would be harmful to the public interest.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 4 day of December, 2015 in Paris, France.



Robert Bullard, Ph.D.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	)))))))))	Case No. 15-1363 (and consolidated cases)

DECLARATION OF MARK MAGAÑA

I, Mark Magaña, declare as follows:

1. I am the President and Chief Executive Officer ("CEO") of GreenLatinos (formerly the National Latino Coalition on Climate Change) and have served in that capacity for eight years. I coordinate a broad coalition of Latino leaders committed to addressing national, regional and local environmental, natural resources and conservation issues that significantly affect the health and welfare of the Latino community in the United States and abroad.

2. GreenLatinos is a national non-profit organization that provides an inclusive space for its members to establish collaborative partnerships and networks to improve the environment; protect and promote the conservation of natural resources; amplify the voices of minority, low-income and tribal communities; and train Latino environmental leaders for the benefit of the Latino community and

beyond. GreenLatinos advocates for policies and programs to advance these purposes.

3. I am the first Latino to have served as senior staff at both the White House, as Special Assistant for Legislative Affairs to President Clinton, and in Congressional leadership, as Senior Policy Advisor to House Democratic Caucus Vice Chair Robert Menendez.

4. I also served as a politically appointed Congressional Liaison at the Department of Health and Human Services. In addition, I served as the Legislative Assistant to Congressional Representative Jim McDermott (D-WA), as a Federal Legislative Representative for the City of Los Angeles, and as a Research Assistant for the National Association of Latino Elected and Appointed Officials (NALEO). My public service in these positions spans ten years.

5. I currently serve on the boards of the League of Conservation Voters, Green 2.0, Green Leadership Trust, and the Children's Environmental Health Network.

6. As a result of my extensive experience as a national leader of the Latino community, I am personally familiar with the facts stated in this declaration and, if called upon, would competently testify to them.

7. The purpose of this declaration is to provide information relevant to the pending motions for stay of the Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan"). Harry C. Alford, President and CEO of the National Black Chamber of Commerce and declarant for

Peabody Energy Corporation ("Mr. Alford"), asserts that the Clean Power Plan will disproportionately impact Latino communities, Alford Decl. ¶ 4; that it "will lead to lost jobs, lower incomes, and higher poverty rates" for these communities, id. ¶ 5; that increased electricity costs will fall disproportionately on Latino communities, who spend a larger portion of their income in utility and household goods, id. ¶ 6-8; that it will cause them millions of job losses, id. ¶ 10; and that it will result in an increase in poverty levels in these communities, id. ¶ 12.

8. In my opinion, and based on my deep personal knowledge of and national engagement with the Latino community for many years, each of Mr. Alford's characterizations of the Clean Power Plant's impact on Latino communities is incorrect. As I explain further below, neither Mr. Alford, nor his business group to the extent that it shares his views, represent the views of the majority of Latinos in the United States, who strongly support strict environmental standards because they are keenly aware of the importance of clean air for community health and a better standard of living. Mr. Alford omits any mention of the disproportionate exposure of Latino communities to air pollutants from power plants and their debilitating impacts.

9. I am very aware that Latinos, which are the fastest growing minority group in our country, are shouldering a disproportionate share of the harms caused by power plant pollution. I have made myself familiar with studies and reports documenting the effects of that pollution on climate change, health, the environment, and Latino communities in particular, some of which are described below. My declaration is based on the information in these reports and on my first-hand observations.

10. For example, the recent National Climate Assessment describes critical health impacts from carbon pollution and climate change that are already being felt today across the nation, and are likely to pose even greater threats in the future, including: heat waves, wildfires, extreme changes in weather such as drought and excessive precipitation, flooding, dust storms, and the spread of infectious diseases.[1]

11. I am aware that the buildup of carbon pollution will result in warmer temperatures, which increase the risk of unhealthy ozone levels. Any increases in ozone pollution—a trigger of asthma attacks—will disproportionately affect Latino communities. Asthma rates in America have doubled in the past 30 years, and Latinos are 60 percent more likely to visit the hospital for asthma. Latino children are 40 percent more likely to die from asthma when compared to non-Latino Whites.[2]

12. The Centers for Disease Control found that nearly half of Latinos live in counties where the air is unsafe to breathe because it exceeds ground-level ozone standards.[3] Almost forty percent of Latinos live within 30 miles of a power plant,[4] which are responsible for a large share of this dangerous pollution. Latinos are less likely to carry health insurance than any other minority group, which makes it very difficult for them to cope with pollution-related health problems.[5] It is the pollution

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[1] Melillo, Jerry M., Terese Richmond, and Gary W. Yohe, eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*, U.S. Global Change Research Program, *available at* http://nca2014. globalchange.gov/downloads

[2] U.S. Department of Health and Human Services, Office of Minority Health, Asthma and Hispanic Americans, *available at* http://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=60 .

[3] Voces Verdes, *Latinos and Air Pollution*, June 8, 2015, *available at* http://www.vocesverdes.org/in-the-news/556/latinos-and-air-pollution .

[4] Natural Resources Defense Council, *U.S. Latinos and Air Pollution: A Call to Action* (September 2011), *available at* http://www.nrdc.org/air/files/LatinoAirReport.pdf, at 5.

[5] *Id*. at 7.

from power plants, and not the Clean Power Plan, which endangers Latino communities and causes them to suffer disproportionate adverse effects from that pollution.

13. GreenLatinos' members across the nation strongly support the Environmental Protection Agency's ("EPA") carbon pollution standards for existing power plants ("Clean Power Plan"). Power plants are responsible for 40 percent of carbon pollution in the United States. These long-awaited standards represent the most important action to fight climate change so far undertaken in the United States.

14. The Clean Power Plan will begin to protect our public health immediately and in the future. As further explained below, several features of the Clean Power Plan, including states' engagement with minority communities affected by power plant pollution, will begin shortly. And once implemented, the standards will serve to reduce dangerous air pollutants that cause respiratory and cardiovascular illnesses and disproportionately impact Latino communities. The Clean Power Plan will also help reduce our electricity bills and increase good jobs through investments in renewable clean energy and efficiency.

15. On behalf of all our members, in our comments to the proposed rule we urged the EPA to strengthen and finalize the standards as soon as possible, in order to ensure that emissions from existing power plants are rapidly reduced by the amounts that modern science indicates is necessary to protect the health of our communities.[6]

16. In the final rule, EPA performed an environmental justice analysis of

[6] GreenLatinos et al., *Comments on the EPA Clean Power Plan Proposed Rule* (December 1, 2014), available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-23321 .

the demographic and environmental situation within three miles of each power plant, and found that a higher percentage of minority and low-income communities live near power plants when compared to the national averages. EPA's analysis confirms the deleterious impact power plants have on minority communities. The Clean Power Plan also encourages states to conduct their own environmental justice analyses as they develop their state implementation plans.

17. In addition, the Clean Power Plan requires states to meaningfully engage vulnerable communities as they develop their plans. States that want to obtain an extension for submitting their final plans in 2018 must make an initial submittal in September 2016 that explains how they are engaging vulnerable communities and how they intend to ensure their continued involvement as they develop their final plans.

18. Finally, the Clean Power Plan provides specific incentives for the benefit of low-income communities through the establishment of the Clean Energy Incentive Program ("CEIP"). The CEIP is a voluntary program which will provide regulated power plants credit for wind and solar projects, as well as double credit for the early expansion of energy efficiency in low-income communities that generate reductions in 2020 and 2021. Each of these features of the Clean Power Plan will create significant near-term benefits for all minority communities affected by power plant pollution.

19. Specifically, the Clean Power Plan will provide important health benefits for communities nationwide, including Latino communities, because carbon pollution reductions will also help to reduce ozone and particulate matter pollution.

The EPA estimates that the Clean Power Plan will result in up to $54 billion dollars in public health and climate benefits. By 2030, the Clean Power Plan will avoid 3,600 premature deaths, 1,700 heart attacks, and 90,000 asthma attacks, because cleaning up carbon pollution will reduce other pollutants from power plants, such as sulfur dioxide, nitrogen oxides, and mercury. Improved public health will also save Latino families' money on health costs related to the pollution from dirty power plants that make Latino communities sick.

20. EPA has also estimated that the Clean Power Plan will reduce electric bills nationally, by about $7 per month by 2030. Precisely because Latino families spend a higher percentage of their income on electricity bills, as Mr. Alford notes, these savings from reduced energy consumption will represent a huge positive effect for Latino households. In addition, renewable energy such as wind and solar will continue to become more affordable and will result in meaningful health and economic benefits to Latino families.

21. The Clean Power Plan will also create thousands of new jobs. Jobs in the solar industry have greatly increased in recent years, and Latinos are already working in the expanding clean energy industry in many places across the country; for example, in Knoxville, Tennessee; McAllen, Texas; Little Rock, Arkansas; Albuquerque, New Mexico; and Los Angeles, California.[7]

22. Multiple surveys have for years shown that Latinos are among the

[7] National Council of La Raza, *Five Metropolitan Areas Where the Latino Workforce and the Clean Energy Economy Overlap* (2013), *available at* http://publications.nclr.org/bitstream/handle/123456789/1125/brightgreen_51613.pdf?sequence=1&isAllowed=y .

strongest supporters of climate action. A national survey of Latino voters conducted by Latino Decisions in partnership with Earthjustice and GreenLatinos in late June and July of 2015 shows that 82 percent of the Latinos surveyed are worried about climate change, and 83 percent specifically support the establishment of national standards to reduce carbon emissions from power plants. In addition, 84 percent of Latinos believe that the U.S. should mandate more clean energy sources like solar and wind power.[8]

23. Moreover, Latinos reject the false claim that there is a tradeoff between environmental protection and economic growth. A substantial majority of Latinos (59 percent) think that stronger environmental laws will actually improve economic growth and create new jobs. The majority of Latinos (between 75 and 77 percent) also understand that clean energy will reduce electric bills in the long term but, if needed, would be willing to pay higher bills in the short term to get their electricity from clean energy sources such as wind and solar.

24. Even in California and Florida, two states that according to Mr. Alford will be among the most harmed by the Clean Power Plan due to their higher concentrations of African-American and Hispanic populations (id. ¶ 14), Latinos overwhelmingly support climate action.

25. In California, 88 percent of the Latino voters surveyed support the United States requiring carbon pollution limits on power plants; 73 percent support

[8] Earthjustice & GreenLatinos, *2015 Environmental Attitudes Survey by Latino Decisions* (2015), *available at* http://earthjustice.org/sites/default/files/files/FINAL%20NATIONAL%20-%20%28FOR%20THE%20PUBLIC%20RELEASE%29%20V1%20EJ-GL%20Survey%20Final%20English%20Spanish.pdf .

the establishment of requirements for clean energy such as wind and solar; 64 percent believe that stricter environmental standards would improve economic growth and create new jobs; and between 69 and79 percent understand that electricity bills will decrease with clean energy in the long run but would be willing to pay higher monthly electric bills in the short term to get their electricity from clean energy such as wind and solar.[9]

26. In Florida, 85 percent of Latino voters think the United States should mandate more clean energy sources like solar and wind power; 81 percent support the establishment of carbon pollution limits for power plants; and 72 percent understand that clean energy will help reduce electric bills in the long term but would be willing to pay higher monthly bills in the short term to source their electricity from wind and solar.[10]

27. A stay of the Clean Power Plan would harm the interest of GreenLatinos' members and Latino communities across the country. To the extent a stay leads to any delay in Clean Power Plan implementation, Latino communities will continue to be harmed by the impacts of climate change and air pollution which need to be urgently addressed.

28. Even if a stay did not lead to a delay in Clean Power Plan implementation, Latino communities would be harmed if the rule is stayed. The

[9] Earthjustice & GreenLatinos, *2015 Environmental Attitudes Survey by Latino Decisions: California* (2015), *available at* http://earthjustice.org/sites/default/files/files/CAOFFICIALSTATEEarthjusticeGreenLatinos2015EnvironmentalAttitudesSurvey.pdf.

[10] Earthjustice, Green Latinos, Latino Decisions – *2015 Environmental Attitudes Survey TOPLINES* (2015), *available at* http://earthjustice.org/sites/default/files/files/FL-Latino-Poll-Toplines.pdf.

initial plan submittal process provides a venue for Latino communities, who often have no voice in policy making, to advocate for the preparation of state environmental justice analyses and to begin explaining their concerns to ensure final state plans will benefit them by reducing pollution in these communities and expanding clean energy and good jobs. Formal outreach to communities is not difficult for state agencies to undertake and is extremely important to our communities.

29. In addition, staying the Clean Power Plan may suspend or delay the incentives for early action that EPA has provided in the CEIP. A stay would not only deny Latino communities of the opportunity to advocate for our states to participate in the CEIP during the initial stakeholder process; it would also deprive us of the benefits of reduced pollution, job creation, and lower electric bills as soon as is possible under the Clean Power Plan.

30. For the foregoing reasons, I believe that a stay of the Clean Power Plan is unjustified and would be harmful to the public interest.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this _5_ day of December, 2015 in Paris, France.



Mark Magaña

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency, et al. Respondents.	))))))))))	Case No. 15-1363 (and consolidated cases)

DECLARATION OF RON BUSBY, SR.

I, Ron Busby, Sr., declare as follows:

1. I serve as the President and CEO of the U.S. Black Chambers, Inc. I am a successful business owner with significant experience in the small business arena: as just one example, I grew my first business, USA Super Clean, from $150,000 in annual revenue to over $15 million per year. I have also worked in senior management positions at major corporations including Exxon, Xerox, IBM, and Coca-Cola USA. In the course of my career, I have served on boards and committees including the Arizona Governor's African American Leadership Council, the Greater Phoenix Chamber of Commerce Board of Directors, the Bay Area Chapter of the 100 Black Men (as

President), the Urban League, and Kappa Alpha Psi Fraternity, Inc. I received a B.A. with honors from Florida A&M University and an M.B.A. with honors from Clark Atlanta University.

2. My organization, the U.S. Black Chambers, Inc. (USBC) represents 240,000 African American-owned businesses and 118 African American Chambers of Commerce nationwide. Our goal is to grow businesses, level the playing field, and help black families realize economic empowerment. Our efforts include policy advocacy, outreach to financial institutions on access to capital issues, technical assistance to members on contract opportunities, entrepreneur training, and support for member chambers nationwide.
3. USBC believes that the Clean Power Plan is an opportunity for a healthier environment and economy. As part of our support for the Clean Power Plan, USBC recently kicked off a national conversation on the economic and public health impacts of climate change in urban areas. Working with our member chambers, we have organized a series of community meetings in Austin, TX, Baltimore, MD, and St. Louis, MO on the impact climate change is having on African American communities.
4. USBC strongly supports the Clean Power Plan because it will stimulate economic opportunity by supporting clean energy industries and jobs. Clean energy sectors have become powerful economic engines. In 2014, the U.S.

solar industry employed over 173,000 workers and experienced its second consecutive year of 20%+ employment growth, according to industry estimates.[1] The wind energy sector boasted an estimated 73,000 employees in 2014, adding more than 20,000 jobs from the previous year.[2] Meanwhile, one analysis by the Brookings Institution estimated that there are more than 830,000 jobs in energy and resource efficiency nationwide.[3]

5. These industries provide important opportunities to rebuild some of the high-quality jobs our nation has lost in recent years. Compared to the national economy as a whole, the wind and solar industries are manufacturing intensive.[4] The clean tech sector also can offer more opportunities and better pay for low- and medium-skilled workers.[5]

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[1] The Solar Foundation, STATE SOLAR JOBS CENSUS 2014, available at http://www.thesolarfoundation.org/wp-content/uploads/2015/02/Solar-State-Fact-Sheet_FINAL.pdf.

[2] American Wind Energy Association, WIND ENERGY FACTS AT A GLANCE, available at http://www.awea.org/Resources/Content.aspx?ItemNumber=5059&navItemNumber=742; American Wind Energy Association, AMERICAN WIND ENERGY REBOUNDED IN 2014, available at http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=7444.

[3] Brookings Institution, SIZING THE CLEAN ECONOMY: A NATIONAL AND REGIONAL GREEN JOBS ASSESSMENT 48 (2011), available at http://www.brookings.edu/~/media/Series/resources/0713_clean_economy.pdf.

[4] *Id.* at 4.

[5] *Id.*

6. USBC also supports the Clean Power Plan because EPA estimates it will reduce electricity bills by $7/month on average for American families and businesses once it is fully implemented. Because African Americans on average spend a significantly higher proportion of household costs on energy, we have particular interest in the potential for a clean energy economy to provide low-cost electricity. The Clean Power Plan's flexible approach empowers the use of low-cost pollution reduction strategies, such as energy efficiency. In particular, the Clean Energy Incentive Program, by rewarding energy efficiency in low-income communities, can provide a valuable incentive to lower bills in vulnerable communities.
7. The Clean Power Plan is also a critical next step in reducing emissions of pollutants that disproportionately harm communities of color. The foundation of a strong economy and a more equitable society starts with stable, healthy lives where those who have the least are not suffering the most from the devastating impacts of pollution and climate change. No community knows that better than ours.
8. Climate change threatens our health by aggravating air quality problems and contributing to extreme temperatures. Carbon pollution is also emitted alongside dangerous pollutants, like smog precursors and soot, that harm vulnerable communities. Communities of color are particularly at risk

because many black families live near power plants and/or in areas with poor air quality. The Centers for Disease Control and EPA have issued countless reports detailing the devastating effects on vulnerable communities from climate change and the pollution that comes with it. Black communities already suffer from relatively higher rates of asthma and respiratory ailments: our children are twice as likely to suffer from asthma, and we are three times as likely to be admitted to the hospital because of an asthma attack.[6] African Americans have also been found more at risk from health impacts and mortality from high temperatures.[7]

9. USBC supports the Clean Power Plan because we understand the challenges of getting businesses to invest in communities burdened by pollution, or helping people overcome the steep hurdle of higher health costs when they are already struggling to find jobs or start a business. In the cities where our Black Chambers live and work, cutting pollution and protecting public health are key to growing healthy lives and businesses. EPA estimates that

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[6] American Lung Association, TRENDS IN ASTHMA MORBIDITY AND MORTALITY 16 (September 2012), available at http://www.lung.org/assets/documents/research/asthma-trend-report.pdf.

[7] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, INDICATORS OF CLIMATE CHANGE IN CALIFORNIA 124 (August 2013), available at http://www.oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsReport2013.pdf.

the Clean Power Plan will prevent 300,000 missed school and work days every year once fully implemented, among other important contributions towards healthier, stronger communities.

10. A stay of the Clean Power Plan risks delaying the essential health and welfare benefits that it will provide. To the extent a stay delays investments in clean energy sectors, it will harm entrepreneurs and communities eager for the jobs and economic opportunities that come along with such investment. Accordingly, I believe that a stay of the Clean Power Plan is not in the public interest.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 7th day of December, 2015, in Washington, DC.



RON BUSBY, SR.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, et al. Petitioners, v. United States Environmental Protection Agency and Regina A. McCarthy, Administrator, United States Environmental Protection Agency Respondents.	)	Case No. 15-1363 et al.

DECLARATION OF THE REVEREND CANON SALLY BINGHAM

I, Rev. Canon Sally Bingham, declare as follows:

1. I am President and Founder of The Regeneration Project and serve as the President of the Interfaith Power & Light (IPL) campaign. As President of IPL, my office is the convener of forty state programs with 18,000 congregations in our still growing network. IPL is a religious response to climate change engaging approximately 5 million people of faith in cutting carbon emissions. We teach that climate change is a moral issue; one that religions must take seriously. As Pope Francis reminds us, climate change is

a profound moral crisis and a matter of justice towards the poor and future generations.

2. IPL engages people of all faiths about the moral responsibility we have for taking care of Creation and for each other. We are called to "love God and love our neighbors" which we reflect through good stewardship of our land, air and water. We started with a few Episcopal churches in California in 2000 and have been growing rapidly ever since, just one sign of how this ministry resonates with the faith community. IPL agrees with the 72% of Americans who view acting on climate change as a moral issue.

3. IPL's commitment to mitigating climate change also flows from our concern for social justice and dedication to protecting vulnerable communities who most often have no voice in policy making or regulation. Low income communities are the most adversely affected by pollution, demonstrated by the high rates of respiratory problems, lung cancer and asthma in these locations. We support policies that will reduce pollution, clean the air, and reduce hospital visits. We also believe that sound climate policies – like the Clean Power Plan - will create jobs and economic opportunities that are desperately needed in these communities.

4. For the reasons stated above, IPL strongly supports the Clean Power Plan and other policies aimed at stemming climate change. The IPL campaign and its

partners advocated vigorously in favor of the development of strong carbon pollution standards for the power sector. Among other things, IPL delivered thousands of comments of support for the Clean Power Plan from our constituents. IPL then joined with other religious organizations to meet with EPA Administrator Gina McCarthy and deliver the comments with a message of support on behalf of millions of people of faith. We followed up with over 70,000 letters and cards to U.S. Senators, asking them to support the EPA action. We are now working to support the implementation of the Clean Power Plan in states around the country.

5. Regulations like the Clean Power Plan support our engagements and work, catalyzing our ongoing efforts throughout the country. One such IPL initiative, called Cool Congregations, invites member congregations to undertake projects that improve energy efficiency, generate clean renewable energy, and provides guidance and advice to support their efforts. The effort is underpinned by a belief that people of all religions have a shared purpose in doing our part to keep God's creation clean and healthy for the future. The initiative has been highly successful in reducing greenhouse gas emissions. Our first 20 certified Cool Congregations are averaging 42% decreases in greenhouse gas emissions, and are jointly preventing 2.2 million pounds of greenhouse gases from entering the atmosphere every year. We believe that

the Clean Power Plan would encourage the kinds of projects undertaken through Cool Congregations, which reduce emissions from the power sector and could help power companies comply with Clean Power Plan emissions standards.

6. In almost every instance, co-benefits emerge as well from this initiative. For example, a Cool Congregations project in Hayesville, North Carolina not only reduced CO_2 emissions by 33 metric tons/year, it provided 40 disadvantaged families with reduced energy bills. Success was achieved by teams providing a free energy assessment, identifying sources of low cost materials, and locating sources of funding. Upgrades included such things as LED lights, weather stripping, insulation, and replacing inefficient heating and cooling systems. A Cool Congregations project in Overland Park, Kansas, is providing similar success, yielding a 15% carbon footprint reduction while at the same time saving the church $3,800 a year. These Cool Congregations projects demonstrate that significant emission reductions from the power sector can be achieved while directly benefiting low-income households, consumers, and congregations.

7. The Paris Pledge is another such IPL initiative, mobilizing the faith in support of ambitious, measurable commitments toward reducing their greenhouse emissions. 300 congregations and several thousand individuals

have already pledged to reduce their carbon footprint 50% by 2030 and become carbon neutral by 2050. This number is expected to grow in light of the Clean Power Plan, as we understand that actions within communities impact and are impacted by larger policy choices. Just as the Clean Power Plan strengthens our Nation's role in ensuring global emissions reductions, so too does it strengthen action at the local level.

8. IPL's experience with congregational energy efficiency and renewable energy demonstrates that such projects can yield dramatic reductions in greenhouse gas emissions. We have seen that such projects can also yield co-benefits important to our congregations, such as aiding the disadvantaged and providing local economic benefits. Because the clean energy projects IPL encourages reduce power sector emissions, I understand such projects could directly or indirectly assist owners of electric generating units in achieving compliance with the Clean Power Plan.

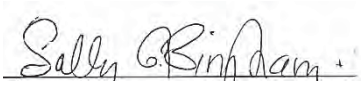
9. If the Clean Power Plan is implemented in the timeframe EPA has provided, I expect that interest and investment in the types of clean energy projects that IPL promotes would continue to grow in coming years. A stay of the Clean Power Plan, by contrast, would impair our efforts to mobilize congregations to undertake clean energy projects, and deprive the communities where we

work of the environmental and economic benefits associated with such projects.

10. A stay of the Clean Power Plan would also harm the interests of the growing 18,000 congregations in 40 states that participate in IPL, and who share the belief that climate change is the greatest moral challenge of our time. I believe that the Clean Power Plan will have a catalyzing effect on the IPL efforts described above, aiding local communities and congregations throughout the Nation. To the extent a stay leads to any delay in Clean Power Plan implementation, as stay movants argue, we are deeply concerned that our congregations will be harmed by climate change and air pollution impacts.

11. For the foregoing reasons, I believe that a stay of the Clean Power Plan is unjustified and would be harmful to the public interest. With a plan in place and many states already making strides toward a clean energy future, I think it would be immoral and dangerous to delay the implementation of the Clean Power Plan. Our experience has been that there are opportunities available today to make tangible progress that provides valuable co-benefits; in contrast, the longer we wait to clean up the air and the longer we wait to develop clean sources of energy, the more expensive it will be. We will eventually have to cut carbon or threaten our very existence.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 4th day of December, 2015, in San Francisco, California.



Rev. Canon Sally Bingham

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

JOINT ADDENDUM:

Exhibits in Support of Movant Respondent-Intervenors' Responses in Opposition to Motions for Stay

Part C

Declarations in Support of Power Company Intervenors

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF JAMES BAGGS

I, James Baggs, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am the Interim General Manager and CEO at The City of Seattle's City Light Department ("Seattle City Light"). I am providing this declaration in support of the Power Companies' response in opposition to the motions for stay filed by several Petitioners in the above-captioned litigation.

2. Seattle City Light is the tenth largest municipally-owned electric utility in the United States and provides electricity to approximately 415,000 customers in the Seattle area. Ninety percent of Seattle's electricity is generated through hydroelectric operations, much of which Seattle City Light owns and operates directly. The remainder of Seattle City Light's portfolio consists of purchases from a diverse mix of sources, including nuclear, wind, coal (< 1%) and landfill gas generation (<1%).

3. In operating its fleet and managing its broader resource portfolio, Seattle City Light has grown uniquely adept at managing uncertainty in future resource needs. Hydroelectric resources, which comprise roughly 90 percent of Seattle City Light's portfolio, are prone to volatile swings in output, requiring Seattle City Light to procure additional power in drier years when its hydroelectric operations produce substantially less electricity than average. To address this uncertainty, Seattle City Light participates in the wholesale energy markets, which allow it to buy forward in certain years during summer and fall months on an as-needed basis, while also allowing it to sell excess power during the spring. Addressing risk and seasonal contingencies like this in our procurement decisions is a routine and unavoidable necessity and one that the electric sector is well accustomed to confronting.

4. Seattle City Light supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) (hereinafter, "Clean Power Plan" or "Plan") and was a

strong supporter of the Plan in its proposed form.[1] Seattle City Light believes addressing climate change through regulation of greenhouse gas ("GHG") emissions at a national level is critically important and that the Clean Power Plan sets achievable goals for the nation's utilities and power generators.

5. In step with this belief, Seattle City Light became the first utility in the nation to achieve net-zero GHG emissions, first achieving this accomplishment in 2005 and repeating it each year since then.

6. To achieve our goal of reducing GHG emissions, Seattle City Light divested its eight-percent ownership share of the Centralia Coal Plant in 2000, a 107.4-MW share of the plant's capacity. From 2001 to 2006, we effectively replaced that capacity with a contract for 100 MW of capacity from the Klamath Falls Cogeneration Plant. Since that time, Seattle City Light has replaced that capacity with new low- and zero-emitting renewable resources, including by acquiring 175 MW of capacity from the Stateline Wind Farm, increasing the capacity we purchase through the Bonneville Power Administration (which typically consists almost exclusively of hydropower (89%) and nuclear (10%) resources), securing 12.8 MW of capacity produced from gas generated by the Columbia Ridge landfill, as well as acquiring 3 MW of capacity produced from biomass and 2.4 MW of capacity produced from biogas.

7. In addition to divesting its coal resources and acquiring renewable energy in its place, Seattle City Light purchases renewable energy certificates

[1] Letter from Jorge Carrasco, General Manager and CEO, Seattle City Light, to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602-23941.

("RECs"). A REC represents one megawatt-hour ("MWh") of generation by an eligible renewable generating source. Seattle City Light's purchases have included RECs from renewable projects covering 2015-2019. By purchasing RECs at a reasonable price through the market, Seattle City Light is able to meet the obligations imposed on it pursuant to the State of Washington's renewable portfolio standard ("RPS"), without itself being required to develop or acquire the underlying renewable generating units or their capacity. Seattle City Light anticipates that market opportunities such as these will develop and remain available as compliance pathways under the Clean Power Plan to drive investment in low- and zero-carbon generating resources.

8. Seattle City Light has also initiated robust energy efficiency programs that have helped it achieve and sustain carbon neutrality over the past decade. These programs include support of stringent energy codes, advanced building controls, and innovative demand-side incentive programs. In 2013, for instance, Seattle City Light launched a "pay-for-performance" pilot project with commercial office buildings, which is showing significant reductions through the second year of implementation. Under this pilot, Seattle City Light provides financial incentives through ongoing payments for incremental energy savings, rather than on a one-time basis as is done through its traditional energy conservation programs. This allows us to assess and reward energy efficiency based on actual energy savings, rather than projected savings. Two of the three pilot buildings have just completed two years of operation under this program; the third building will complete its second year within a few months. Combined energy savings for the first two buildings has proven to be significant,

totaling about 2.7 million kilowatt-hours annually and providing cost savings of $150,000 annually. Altogether, through our aggressive implementation of legacy and current energy efficiency programs, our annual load is reduced by 1.5 million megawatt-hours, which is approximately the equivalent of a 150-MW power plant each year.

9. Seattle City Light anticipates that its efforts to reduce emissions across its portfolio, as well as its commitment to achieve further reductions going forward, will go far towards helping meet any requirements that should ultimately be imposed upon affected electric generating units pursuant to the Clean Power Plan.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.

James Baggs, Interim GM &
CEO, Seattle City Light

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF J.D. FURSTENWERTH

I, J.D. Furstenwerth, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am Senior Director of Environmental Services with Calpine Corporation ("Calpine"). I am providing this declaration in support of the Power Companies' response in opposition to the motions for stay filed by several Petitioners in the above-captioned litigation.

2. Calpine owns 83 natural gas-fired and renewable geothermal power plants in operation or under construction that are capable of delivering nearly 27,000 megawatts of electricity to customers in the United States ("U.S."). Of the 10 largest U.S. electricity generators, Calpine has the lowest emissions intensity for both nitrogen oxides and sulfur dioxide, two major contributors to soot and smog pollution.[1] Calpine also has the lowest emissions intensity for carbon dioxide ("CO_2") among the fossil fleets of those 10 largest electricity generators.[2]

3. Calpine supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) (hereinafter "Clean Power Plan" or "Plan"). This support has been unwavering since the Clean Power Plan's infancy, as demonstrated through Calpine's submission of multiple comments, both as a group and individually, which supported its objectives, legality and reasonableness.[3] When the Clean Power Plan was

[1] Natural Resources Defense Council et al., Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, at 10 (2015), *available at*: http://www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2015.pdf (emissions and generation data from 2013).

[2] *Id.*

[3] *See* Letter from J.D. Furstenwerth, Senior Director, Environmental Services, Calpine to EPA (Nov. 26, 2014), EPA-HQ-OAR-2013-0602-22799; Letter from Calpine Corporation et al. to EPA (Dec. 1, 2014) EPA-HQ-OAR-2013-0602-23167 (joint comments on proposed CPP by companies including Calpine, National Grid, and Seattle City Light); Letter from Michael J. Bradley, Director, The Clean Energy Group to EPA (Dec. 1, 2014) EPA-HQ-OAR-2013-0602-23169 (comments on proposed CPP by the Clean Energy Group, a diverse coalition including Calpine).

prematurely challenged by several parties, including Petitioners in these proceedings, Calpine supported EPA by filing an *amicus curiae* brief, wherein it urged the Court to dismiss those challenges and refrain from short-circuiting the ordinary rulemaking process.[4]

4. Calpine's support for the Clean Power Plan stems from its commitment to environmental excellence and belief that strong environmental objectives can operate in tandem with sound business objectives. In step with this commitment, Calpine was proud to join the White House's American Business Act on Climate Pledge, through which we pledged to continue our efforts to work with the states where we operate to help develop the most effective implementation plans for Clean Power Plan compliance, support market-based solutions aimed at lowering emissions in the power sector and explore investment in carbon technologies, such as efficient natural gas turbines, renewable and battery storage and.[5]

5. The tremendous flexibility afforded to states to develop plans suited to their unique needs and mix of electric generating units is one of the greatest virtues of

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[4] Brief for Calpine as Amicus Curiae Supporting Respondents, *In re Murray Energy Corp.*, 788 F.3d 330 (D.C. Cir. 2015).

[5] *See* "Fact Sheet: White House Announces Commitments to the American Business Act on Climate Pledge", The White House, Office of the Press Secretary (Oct. 19, 2015); *available at*: https://www.whitehouse.gov/the-press-office/2015/10/19/fact-sheet-white-house-announces-commitments-american-business-act (announcing that 81 companies, with operations in all 50 states, employing over 9 million people, representing more than $3 trillion in annual revenue, and having a combined market capitalization of over $5 trillion, signed the American Business Act on Climate Pledge to demonstrate support for action on climate change and the conclusion of a climate change agreement in Paris that takes a strong step forward toward a low-carbon, sustainable future).

the Clean Power Plan. The Plan operates by requiring states to develop plans that provide for the establishment of emission limitations for two subcategories of affected units, which limitations must reflect the best system of emissions reduction that has been adequately demonstrated (hereinafter, the "BSER"). In turn, the Plan provides states a great deal of flexibility to adopt those limitations in different forms, including market-based programs that allow owners of the affected units significant flexibility in demonstrating compliance.

6. In evaluating the strategies that power generators and states were already effectively using to reduce CO_2 emissions from the affected units, EPA determined that the BSER should be based on the emission reduction potential achievable by use of three "building blocks", including (1) heat rate improvements at affected steam generating units, (2) shifting generation from higher-emitting affected steam generating units to lower-emitting existing natural gas combined cycle ("NGCC") units, and (3) increasing generation from new zero-emitting renewable sources in place of affected fossil fuel-fired generating units. By evaluating what reductions were achievable through application of these existing strategies, EPA calculated two nationally uniform CO_2 emission performance rates to be achieved by affected generating units: 1,305 pounds ("lb") of CO_2 per megawatt-hour ("MWh") for fossil fuel-fired steam generating units, and 771 lb CO_2 / MWh for stationary combustion turbines. These represent the final rates to be achieved by the affected generating units in 2030 and thereafter, with a gradual phase-in of the building blocks and resulting emission reduction obligations before then.

7. Rather than prescribing how each affected unit must achieve these rates (*i.e.*, by mandating application of each building block in a particular manner at a particular time), EPA provided states broad and open-ended flexibility to design implementation plans suited to their unique needs and circumstances. Recognizing that implementation would take time, EPA set generous deadlines for submittal of final state implementation plans (September 6, 2018), interim compliance (over the period of January 1, 2022 to December 31, 2029), and final achievement of the emission performance rates or equivalent state rate- or mass-based goals (starting in 2030).

8. Calpine has long supported the extended time horizons and flexibility inherent in the Clean Power Plan's structure, recognizing that it provides states the opportunity to tailor carbon reduction programs to the unique needs of their affected generating units. In particular, Calpine supports this flexibility because it allows states to harness the efficiency of the market to achieve reductions by establishing trading programs, including mass-based allowance trading programs. Calpine believes that such trading programs are the optimal method for reducing CO_2 emissions from the power sector and best reflect the interconnected market realities that define it. Calpine has experienced the success of these programs first-hand through its participation in California's Cap-and-Trade program implemented under Assembly Bill ("AB") 32 and nine northeastern states' Regional Greenhouse Gas Initiative ("RGGI"). This experience has demonstrated to Calpine how particularly well-suited trading programs—and, in particular, mass-based allowance trading programs—are to reducing CO_2 emissions from the power sector.

9. Successful trading programs have developed in numerous other contexts directly affecting the power sector, such as under the Acid Rain Program, Clean Air Interstate Rule ("CAIR"), the Cross State Air Pollution Rule ("CSAPR"), and the Houston area's Mass Emissions Cap-and-Trade Program for NO_x. Some of these programs have been implemented for many years, like the Acid Rain program, which first went into effect two decades ago. In fact, many of the states and utility-sector Petitioners in this case have experience implementing and complying with these programs. Calpine likewise has experience complying with these programs, and its experiences have only strengthened its support for trading through emission markets as the most appropriate means for achieving cost-effective emission reductions from the power sector.

10. The Clean Power Plan will apply to affected generating units no differently than many existing and historic programs under the Clean Air Act designed to reduce emissions from the power sector, which operate by considering reductions available across the electric grid and creating incentives both to reduce the emissions rate of individual units and to shift dispatch from higher- to lower-emitting units. Despite assertions to the contrary, the power sector has grown accustomed to meeting these obligations, the costs of which are regularly incorporated into wholesale power prices and commercial terms, no differently than other generation costs. For instance, Calpine regularly includes provisions addressing greenhouse gas and other emissions in its power purchase agreements to address the parties' respective obligations with respect to both existing and potential future regulatory obligations.

11. Additionally, generators and utilities are used to working with independent system operators and regional transmission organizations to build emissions costs into their market rules; an example of this includes the California Independent System Operator's ("CAISO") adoption of tariff revisions in 2012 to address AB 32 compliance costs, which were subsequently approved by FERC.[6] Since adoption of the tariff revisions, a generator's projected emissions costs are built into its bids on the CAISO markets and recovered in the market clearing price of power. Examples like this demonstrate that these costs can be incorporated into power prices without impairing the operation of the power market or the reliability of the electricity grid.

12. The cost of compliance under existing CO_2 trading programs has been reasonable in Calpine's experience and never approached the "exorbitant" heights that certain Petitioners have warned.[7] Stable, predictable emissions markets with appropriately priced allowances or credits have repeatedly developed where trading programs are implemented as the means of achieving emission reductions, including under AB 32, RGGI, and the Clean Air Act programs designed to address acid rain and interstate transport of criteria pollutants.

13. Certain Petitioners and their declarants have nonetheless asserted that, as a result of the Clean Power Plan's tremendous flexibility, there is no guarantee

[6] *See* Order on Proposed Tariff Revisions – California Independent System Operator Corporation, 141 FERC ¶ 61,237 (2012) (approving proposed tariff revisions to incorporate as a variable cost of generation in the calculation of resource commitment costs the greenhouse gas allowances anticipated to be required under AB 32).
[7] *See* Oklahoma Mot. at 12.

emissions trading will be available under any particular state plan and that, even if adopted, the price of allowances or emission rate credits will be "exorbitantly expensive."[8] *See also* Utility Mot., Attach. L McInnes Decl. ¶ 10 ("there is no guarantee that the states in which Tri-State has generation will opt into the market-based programs. Even if they do, the cost of credits or allowances may be unreasonably priced."); *id.* Attach. N, Johnson Decl. ¶ 31 ("Seminole will need to make decisions and commit to significant expenditures starting in 2016 . . . It does not have the luxury of waiting to see if Florida adopts a trading program or if that program will provide sufficient credits or allowances, at economic prices, to allow the continued operation . . . "); *id.* Attach. P, Campbell Decl. ¶ 22 ("EKPC cannot wait for . . . any CO_2 trading market to be developed, before expending substantial sums on compliance.").[9]

14. Calpine's extensive experience operating under existing emission trading programs demonstrates that these fears are unfounded. Calpine anticipates continued compliance with California's Cap-and-Trade Program and RGGI to meet its reduction obligations under the Clean Power Plan. Given the demonstrated success of these programs at reducing CO_2 emissions, the suitability of CO_2 to market mechanisms (in light of the global nature of its harms), and the electricity sector's familiarity with emissions trading programs, Calpine expects that emissions markets

[8] *See* Oklahoma Mot. at 12; NorthWestern Mot., Hines & Cashell Decl. ¶ 44; Utility Mot., Attach. L McInnes Decl. ¶ 18.
[9] *See also* Utility Mot., Attach. S. Jura ¶ 24.

will develop throughout the rest of the country and that trading will be available as a means for compliance.

15. Beyond emissions trading, owners of affected generating units can undertake direct measures to reduce emissions within their respective fleets. Calpine continues to undertake investments in clean generation technology that reduce emissions across its portfolio, resulting in a fleet that includes some of the newest and cleanest energy centers in the nation. Calpine has maintained a low fleet-wide emissions rate in part through its ownership and operation of fourteen geothermal power plants at The Geysers, California, which together possess a net generating capacity of approximately 725 MW and provide a steady, baseload supply of renewable power 24 hours a day, seven days a week.

16. The market shift towards gas-fired and renewable generation reflected by the BSER was set in motion by a variety of factors, all of which predate the Clean Power Plan. Chief among them are an abundant supply of comparatively inexpensive natural gas and the increasing competitiveness of renewable generation, coupled with the ability of gas-fired and renewable sources to produce electricity with significantly fewer emissions relative to coal-fired generation, or zero emissions entirely.

17. Existing regulatory requirements have also played a role in accelerating this shift. Implementation of federal and state air pollution standards, CSAPR, California's suite of climate initiatives, including Senate Bill 1368,[10] and RGGI have all

[10] *See* Cal. Pub. Util. Code §§ 8340-8341 (prohibiting any load-serving entity or public utility from entering into any long-term financial commitment unless any baseload generation supplied under the commitment complies with the emissions performance

independently driven emissions reductions across the electricity sector and, as a consequence, reductions in coal-fired generation. These existing regulatory drivers, along with independent economic trends within the power sector, are causing coal-fired generation to no longer be competitive.

18. Utilities and generators throughout the electric sector have actively sought to eliminate coal-fired generation from their fleets and portfolios and to replace it with more economical, lower-emitting sources. *See*, *e.g.*, Decl. of James Baggs ¶ 6 (C3) (describing Seattle City Light's divestment of a coal plant in 2000). While co-firing and fuel-switching were not included as one of the building blocks upon which the Clean Power Plan's goals are based, the owners of affected units can also reduce emission from coal-fired power plants by co-firing with natural gas or switching entirely to gas combustion at existing steam units. Calpine, for instance, required as a precondition of its acquisition of Conectiv Energy's assets in 2010 that the coal-fired Edge Moor and Deepwater facilities in Delaware and New Jersey, respectively, discontinue burning coal and be transitioned to natural gas. While Calpine was an early adopter of such an emissions reduction strategy, its experience in this regard is by no means unique.[11]

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standard established by the California Public Utilities Commission and California Energy Commission, currently set at 1,100 lb/MWh CO_2).

[11] *See* Letter from Tomás Carbonell and Megan Ceronsky, Environmental Defense Fund (Dec. 1, 2014), EPA-HQ-OAR-2013-0602-23140, Attach. C, "Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers", Andover Technology Partners (Nov. 30, 2014) at Table E.1. (providing summary of several planned and completed natural gas conversion case studies, including Calpine's Edge Moor and Deepwater facilities).

19. Nothing in the Clean Power Plan requires retirement of a coal-fired unit in the next several years, despite the claims of certain industry Petitioners. *See*, *e.g.*, Nat'l Mining Assoc. Mot., Exh. 3, Marshall Decl. ¶ 14 ("the rule will trigger a wave of early retirements of coal-fueled electric generating stations well before the 2022 compliance date…"). What exactly will be required of any particular generating unit when the emission reduction obligations first go into effect more than six years from now in 2022 has yet to be determined and will depend in significant part on the final plans developed by states, which are not due until late 2018. Further, because the Clean Power Plan phases in emission reduction obligations in three multi-year "interim step" compliance periods between January 1, 2022 and December 31, 2029, affected units will not necessarily even need to begin achieving reductions immediately on January 1, 2022, when the first interim step period (running through December 31, 2024) commences.

20. Because of the tremendous flexibility and generous lead times afforded by the Clean Power Plan, no action need be taken during the pendency of this litigation by any owner of affected units. Any near-term decision to retire a particular coal-fired generating unit, procure replacement generation by contract, or begin development of new units during that time would be the owner's economic choice, attributable to the poor position and downward trajectory of coal-fired generation in the electricity market, and *not* to the emission reduction obligations that will ultimately go into effect pursuant to the Clean Power Plan, long after this litigation is complete.

21. Certain industry Petitioners have relied on EPA's Integrated Planning Model ("IPM") to support the proposition that the Clean Power Plan *requires*

retirements during the pendency of this litigation in order to achieve future compliance. They have suggested that, because IPM predicts that owners with perfect foresight and knowledge of what the future will bring would choose to retire generating units in 2016-2017—years before any regulatory obligation imposed by the Clean Power Plan goes into effect—those projections must serve as the basis for determining what individual companies will, in fact, do during the pendency of this litigation. *See* Utility Mot., Attach. E Greene at ¶ 15 ("EPA's results can be used to assess what individual companies would have to do in order to comply with the Clean Power Plan now.").

22. No prudent owner of an affected coal unit would base its decision to retire a unit on IPM's projections. It is well known throughout the sector that, while IPM makes sound long-term aggregate predictions for the power sector, its specific near-term projections for individual generating units are not accurate predictors of actual behavior.[12] Importantly, IPM does not and cannot account for real world uncertainty, and thus does not capture the "option value" of deferring early retirement decisions until those uncertainties are resolved.[13] If an affected unit were actually to be retired during the course of this litigation, that decision would be based on the owner's economic evaluation of (1) the likelihood that the Clean Power Plan will or will not be in effect more than six years from now in 2022 and (2) a comparison of the projected costs to maintain existing units, relative to sinking those costs

[12] *See* Decl. of Dallas Burtraw and Joshua Linn (to be filed in support of Environmental and Public Health Intervenors' Response) ¶¶ 20-24.
[13] *See id.* at ¶ 22.

immediately into more efficient units. Any near term retirement would therefore be a discretionary, forward-looking business decision—and not a closure that is mandated by the Clean Power Plan.

23. At an even more basic level, it is not even apparent that units not already scheduled for closure will actually be retired during the course of this litigation. Despite suggestions of imminent retirement by some of Petitioners' declarants, no declarant actually states that they will be retiring units not already scheduled for retirement in the near-term. In fact, some of Petitioners' declarants note that, if owners actually intended to take specific units out of service by the beginning of next year, they would have already announced their intent to do so. *See* Nat'l Mining Assoc. Mot., Exh. 1, Schwartz Decl. ¶ 21 (explaining that "any unit intending to retire by the end of 2015 or even in 2016 would long since have announced that fact.").

24. Similarly, claims that the uncertainty created by the Clean Power Plan is preventing certain utilities from moving forward with major contracts,[14] or causing them to make bad deals at this time,[15] are unfounded. As suggested previously, Calpine regularly addresses uncertainty regarding future carbon regulations in the

[14] *See*, *e.g.*, Utility Mot., Attach. J. Rasmussen Decl. ¶¶ 11-15 (suggesting that, in the absence of a stay, Deseret Power cannot extend power sales contracts that expire in the 2020-2025 timeframe because of the risk that its primary generating resource will not be available to provide baseload power after 2022).

[15] *See*, *e.g.*, NorthWestern Mot., Hines & Cashell Decl. ¶ 46 ("Because the Final Rule creates uncertainty… NorthWestern now must incorporate into the contract negotiations the additional risks posed by the potential premature closing of the Colstrip Plant. Incorporation of these risks will increase the overall costs associated with the contract, lessening or eliminating the benefits the contract otherwise would have provided…"); Utility Mot., Attach. L, McInnes Decl. ¶ 8 ("The uncertainty surrounding the Rule may force Tri-State to make sub-optimal financing decisions.").

terms of its power purchase agreements. This is done through negotiation of contract terms that specify how existing and future emissions costs will be borne as between the purchaser and seller of power. This is the normal and prudent means of addressing regulatory risk within the power sector and a routine cost of business that actors within this sector absorb in recognition of the ever-present prospect of regulatory change and increasingly stringent environmental requirements. Industry Petitioners' suggestions that they should be afforded an environment within which to make business decisions free of any regulatory risk associated with carbon emissions[16] are both naïve and unrealistic. Even if a stay were granted, it would be unreasonable and imprudent for a utility *not* to address the risk of future carbon regulations, including under the Clean Power Plan, in its contracts for purchase and sale of power and its transactions to secure long-term future fuel supplies.

25. In this same vein, certain representatives of Industry Petitioners have claimed that they need to act now to ensure favorable contract prices for new turbines and heat recovery steam generators, before the Clean Power Plan drives those prices upward.[17] That a utility owner would make such major commitments now—while, at the same time, actively seeking to have the Clean Power Plan struck down—strains credibility to its breaking point. Regardless, any decision to proceed with a

[16] *See supra* notes 11 and 12. *See also* Utility Mot., Attach. G, Brummett Decl. ¶ 38-39 (suggesting that San Miguel Electrical Cooperative might forgo opening a new area of a lignite mine unless the Clean Power Plan is stayed, which could cause it to continue mining lignite from areas of the mine that are more expensive to mine).

[17] *See* Basin Electric Mot., Attach. 2 McCollam ¶ 21 ("In order to ensure adequate supply for the massive gas and wind build out in our system, at the most reasonable cost possible, Basin Electric will attempt to enter into equipment supply contracts much earlier than normally necessary for a typical project schedule.").

commitment to "lock-in" potentially more favorable pricing today[18] would be a purely economic decision and not due to any imminently applicable regulatory mandate imposed by the Clean Power Plan.

26. Even if an existing coal-fired unit should be retired, it is not necessarily the case that each megawatt of its capacity needs to be replaced with a megawatt of capacity from a new NGCC unit. Indeed, building block 2 of the BSER is premised upon the fact that the nation's existing fleet of NGCC facilities is currently operated at annual utilization rates substantially below 75% of net summertime capacity. Calpine's experience confirms that NGCC units can be operated at even greater annual utilization rates. Thus, the nation's existing NGCC fleet has available capacity, which can be utilized to avoid the need to replace every single megawatt of retiring coal-fired capacity with a megawatt of new NGCC capacity.

27. Utility owners have ample time to wait until the completion of this litigation to seek permits and financing necessary to build any new capacity that might ultimately be needed, once state plans are completed and specific compliance obligations are known. Development of new NGCC capacity can be completed in as little as four years, from the outset of the planning process to completion of construction and power delivery. For example, Calpine is currently building a new 760-MW dual-fueled combined-cycle facility at its existing York Energy Center in Peach Bottom Township Pennsylvania. The new facility, known as "York 2 Energy

[18] *See id.* at note 2 ("Given this potential substantial increase, locking in pricing during the next 2 years before market distortions created by the Final Rule occur is a reasonable and prudent measure.").

Center", is expected to begin commercial operation in the summer of 2017. Calpine did not award the contract to General Electric ("GE") for York 2's combustion turbines until December 10, 2014.[19] Calpine applied for the required air permit on June 9, 2014 and the Pennsylvania Department of Environmental Protection issued the permit on June 14, 2015.[20] In total, Calpine anticipates that the development cycle for York 2 will be less than 36 months, from submission of initial permit applications to commercial operation. Echoing Calpine's experience, other industry Petitioner Declarants suggest a similar or even shorter time frame, depending upon the particular state in which the NGCC unit will be built.[21] Calpine's experience building York 2 also illustrates the opportunity owners of affected units have to shorten the development timeframe by taking advantage of existing transmission and other infrastructure through co-location of new generation capacity on the site of an existing power generation facility. Thus, even assuming that new NGCC capacity needed to be online at the very beginning of the interim compliance period on January

[19] *See* GE, "Calpine Corporation Selects GE Highly Efficient, Flexible Gas Turbines to Power York 2 Energy Center in Pennsylvania" (Dec. 10, 2014); *available at*: http://www.genewsroom.com/press-releases/calpine-corporation-selects-ge-highly-efficient-flexible-gas-turbines-power-york-2.

[20] *See* 45 Pennsylvania Bulletin 225, "Intent to Issue Plan Approvals and Intent to Issue or Amend Operating Permits under the Air Pollution Control Act (35 P. S. §§ 4001-4015) and 25 Pa. Code Chapter 127, Subchapter B" (May 9, 2015).

[21] S*ee* Utility Mot., Attach. C Heidell & Repsher Decl., attached Report, at 10 (noting that "the average time frame for developing a gas-fired combined cycle plant is roughly five years."); *id.* at 9, note 5 (construction of NGCC "in deregulated states such as Texas can generally be completed within 3 years…"); Nat'l Mining Assoc. Mot., Exh. 1, Schwartz Decl., attached Report, at 34 ("The total time for the planning, permitting, and construction of these three large projects has been 58-62 months, or about 5 years.").

1, 2022 in order to meet the requirements of a particular state plan (an assumption that may not be accurate), the five years available following a decision from the Court in this case would provide ample time to bring that capacity online.[22]

28. Financing for such new capacity need not and most likely could not be arranged immediately. In Calpine's experience, construction financing for new generation capacity is generally arranged late in the development cycle, after planning is complete, all permits and approvals have been obtained, and those permits and approvals have completed their respective appeals processes. Even if some utility owners or operators should elect to begin initial planning and permitting during the litigation, costs associated with this phase are typically an insignificant fraction of overall development costs, and in any event substantially lower than claimed by certain Petitioners.

29. To the extent utilities should choose to undertake significant investments now—when the Clean Power Plan does not require any actual reductions from the affected units until 2022 at the earliest—those decisions and expenditures are inherently voluntary business decisions and not the result of any immediate regulatory mandate imposed by the Clean Power Plan. This is especially true with respect to investments to reduce demand or procure qualifying renewable generation

[22] According to the trade associations representing the solar and wind generating industry, new wind and solar generation capacity can be built in ample time to be available in 2022, assuming it should be needed by then and the transmission infrastructure exists to deliver electricity from such resources to the load. *See* Resp. to Mot. for Stay of Advanced Energy, American Wind Energy Association, and Solar Energy Industries Association (Dec. 8, 2015) (to be filed concurrently with the Court in this case) at 3.

through the Clean Power Plan's Clean Energy Incentive Program ("CEIP").[23] It is worth reemphasizing that the CEIP is a purely *optional* program; by design, states are afforded the *opportunity* to award allowances and credits for early reductions achieved in 2020 and 2021, and receive matching allowances or credits in return from EPA. An optional choice to take advantage of these early incentives cannot possibly be construed as an imminent harm the Clean Power Plan mandates be undertaken now. This is even more apparent in light of the fact that the availability of this program in any particular state remains unknown at this time and will not be known until state plans are developed and submitted in September 2018.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.



J.D. Furstenwerth

[23] *See* Utility Mot. Attach. C Heidell & Repsher Decl. ¶ 13 ("To receive [the] additional revenue stream [available under the CEIP], irreversible decisions to obtain financing for and to construct these renewable resources will need to be made in the 2015-2018 period.").

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1409 and Consolidated Cases

(15, 1363, 15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF MICHAEL GIANUNZIO

I, Michael Gianunzio, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am Chief Legislative and Regulatory Officer at the Sacramento Municipal Utility District ("SMUD"). I am responsible for managing all governmental relations, legislative matters and regulatory requirements affecting SMUD at the local, state, and federal levels.

2. Created by voters in 1923, SMUD is the nation's sixth-largest community-owned electric service provider, serving 624,770 customer accounts and a population of approximately 1.4 million.

3. SMUD supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) (hereinafter, "Clean Power Plan" or "Plan"). SMUD also supported the rule in its proposed form, submitting comments together with California's other leading utilities that were supportive of the Plan and the flexibility it provided to individual states.[1] SMUD believes that the Clean Power Plan reflects a reasonable approach to reduce carbon dioxide ("CO_2") emissions from the power sector and builds upon SMUD's own experience in reducing emissions across our generation portfolio, while continuing to provide affordable, reliable electricity to consumers.

4. In furtherance of our emissions reduction goals, SMUD has committed to reducing greenhouse gas ("GHG") emissions to 10 percent of 1990 levels by the year 2050. In 2010, SMUD became the first large electric utility in California to supply 20 percent of energy from qualified renewable sources, exceeding our 2010 goal by 4 percent, and putting us well on pace to meeting our goal of supplying 33 percent of energy from qualified renewable sources by the year 2020.

[1] Letter from Michael Gianunzio, Chief Regulatory and Legislative Officer, Sacramento Municipal Utility District, et al. to EPA (Dec. 1, 2014) EPA-HQ-OAR-2013-0602-23198 (joint comments on proposed CPP by several California utilities, including SMUD, LADWP, SCE, and PG&E).

5. SMUD has built a diverse portfolio of resources to achieve these reductions, while at the same time maintaining low-cost, reliable electric service for our customers. This includes our ownership and operation of the 500-MW Cosumnes Power Plant, a natural gas-fired combined cycle facility that first came online in 2006 and consists of affected electric generating units subject to the Clean Power Plan.

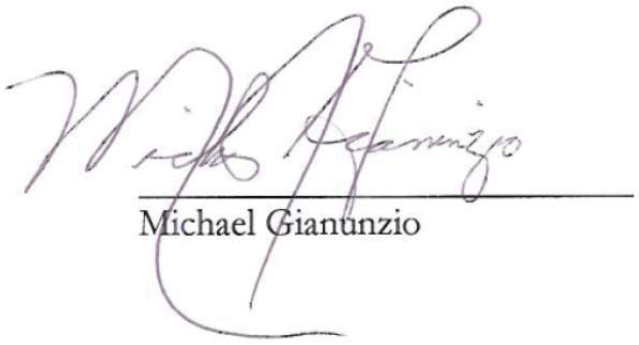
6. SMUD also generates significant capacity from carbon-free resources, including from our Upper American River Project, a 688-MW hydropower system of eleven reservoirs and eight powerhouses that meets approximately 20 percent of SMUD's demand in typical water years. SMUD constructed the nation's first utility-scale solar facility in 1984, and now delivers approximately 7 percent of electricity from wind, including from turbines we own and operate at our Solano Wind Farm.

7. SMUD has also aggressively sought to reduce customer demand, acting as an industry leader in residential and commercial energy efficiency programs. By offering numerous rebate, incentive and financing options to customers, SMUD is reducing GHG emissions, while simultaneously providing cost-savings to customers. Through these energy efficiency programs and our renewable energy investments, SMUD has already reduced GHG emissions 20 percent below 1990 levels and shifted its portfolio to approximately 50 percent carbon-neutral resources.

8. SMUD is supportive of the flexibility the Clean Power Plan affords to achieve its goals through existing state programs, including California's cap-and-trade program implemented under Assembly Bill ("AB") 32. Given the success of the cap-and-trade program under AB 32, SMUD anticipates that similar emissions markets

will develop throughout the U.S. and provide a pathway for owners of affected electric generating units to comply with the requirements imposed pursuant to the Clean Power Plan.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 3, 2015.



Michael Gianunzio

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF JOSEPH T. KELLIHER

I, Joseph T. Kelliher, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay filed by Respondent-Intervenor NextEra Energy, Inc. (NextEra).

2. I am currently Executive Vice President for Federal Regulatory Affairs for Respondent-Intervenor NextEra.

3. Prior to my current position, I served as a member of the Federal Energy Regulatory Commission (FERC) for more than five years, including more than three years as its Chairman. FERC is charged with regulation of the U.S.

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electricity industry and is the principal Federal electricity policymaking agency.

4. Before my appointment to FERC, I served in a number of policymaking roles, including as senior policy advisor for electricity and other domestic energy issues at the U.S. Department of Energy, as majority counsel for the U.S. House Committee on Commerce on issues related to electricity, nuclear waste, hydropower, energy conservation and management of the U.S. Department of Energy, among other positions.

5. In my policymaking roles I have developed and implemented policies designed to assure an adequate supply of electricity, high reliability, and reasonable cost. During my FERC service I worked closely with State public utility commissions (PUCs), since many Federal policies affect State retail markets and implicate State policies governing State regulated utilities. As Chairman I took steps to improve electric system reliability, establishing the FERC Office of Electric Reliability and implementing the mandatory electric reliability provisions of the Energy Policy Act of 2005.

6. The basic regulatory framework for the U.S. electricity industry was laid down in 1935, reflected in the Federal Power Act. FERC regulates wholesale sales of electricity and transmission of electricity in interstate commerce. Under the Energy Policy Act of 2005, FERC was also charged with establishing and enforcing mandatory reliability standards. States regulate retail sales, local

distribution, and utility resource planning. In most of the country, regional transmission organizations and independent system operators control power plant dispatch in order to minimize costs to consumers. This well-developed electricity regulatory structure will be undisturbed by the Clean Power Plan since the Plan makes no change to Federal and State regulatory roles and jurisdictional boundaries.

7. As described in more detail below, I believe that the Clean Power Plan can be implemented in a manner consistent with how the electric power sector operates in the United States with minimal impact on electricity markets and grid operations.

8. The electric power sector has a long history of successfully responding to both State and Federal regulations while maintaining an adequate and reliable supply of electricity for the nation. For example, during my tenure as FERC Chairman, Congress passed the Energy Policy Act of 2005, which granted FERC the authority to approve and enforce mandatory reliability standards to provide for the reliable operation of the bulk power system. FERC certified the North American Electric Reliability Corporation (NERC) as the Electric Reliability Organization (ERO). The ERO develops reliability standards through an industry stakeholder process and files them with FERC. FERC may then approve or remand the standards. The new process for drafting, approving, and enforcing

mandatory reliability standards was a major change for the electric industry but was successfully implemented over a short timeframe, building upon existing regulatory infrastructure and existing electric power sector expertise with respect to the reliable operation of the electricity grid.

9. The Clean Power Plan does not affect this reliability regulatory regime. Moreover, the Clean Power Plan reflects an unprecedented effort by the U.S. Environmental Protection Agency (EPA) to assure that the proposed performance standards do not have an impact on electric system reliability, by incorporating a Reliability Safety Valve, by allowing more time for planning, consultation, and decisionmaking, by providing for review of compliance plans by regulatory agencies and reliability entities, and through ongoing coordination among EPA, FERC, and the U.S. Department of Energy to assure continued reliability during Clean Power Plan implementation.

10. Similarly, both State and Federal environmental regulators have established emission standards in other environmental regulations applicable to the electric power sector. For example, the EPA acid rain control program, adopted in the 1990's, imposed new emission reduction requirements for sulfur dioxide and nitrogen oxides for coal-fired plants. Like the Clean Power Plan, the acid rain program created market-based structures designed to assure the lowest possible cost of compliance for the country. Regulated entities have met these requirements

within the current structure of the electric power sector.

11. I expect that Clean Power Plan implementation will be similar. EPA has set emission guidelines. States will submit State Plans imposing emission standards on electric generating units (EGUs). Affected EGUs will determine the most cost effective and efficient way to comply with these requirements in consultation with States. To the extent that implementation of these requirements requires compliance costs, affected EGUs that operate under cost of service regulation can seek cost recovery through their State PUCs or other authorities with jurisdiction over their rates. In markets operated by a regional transmission organization or independent system operator there are two basic ways to achieve emission reductions through regional dispatch of generating units. First, sellers could incorporate a carbon price into their bids to sell power if the applicable State or region has elected to rely on a carbon fee to achieve the most cost-effective emissions reductions. Second, the owners of EGUs that emit carbon could establish physical limitation on those resources that would govern unit dispatch. Both approaches are currently used in regional transmission organization and independent system operator markets, so the Clean Power Plan would not transform regional market operation.

12. States will determine how to design State Plans under the Clean Power Plan. The electric power sector—and electricity regulators—have long

experience with many of the strategies that affected EGUs could use to reduce their emissions, including increased natural gas generation, increased investment in new renewables, implementing energy efficiency programs, reducing generation from affected EGUs through permits or other run-time restrictions, and market-based pollution control programs. A market-based program requires generators to hold "allowances," in effect placing a price on the act of emitting the regulated pollutant that increases the operating cost of units emitting that pollutant. System operators dispatching electricity resources under security-constrained economic dispatch will dispatch such units less than they otherwise would without such an allowance-holding requirement. The Regional Greenhouse Gas Initiative is an example of a program that has this effect, just as compliance costs for California's carbon trading program have been included in just and reasonable electricity rates.

13. Because the States have not yet begun to develop their clean power plans, it is premature to speculate on which coal-fired units may need to close in order to comply with the Clean Power Plan. For many years there has been a secular trend away from the use of coal for electricity generation in this country, and coal's share of U.S. electricity generation has been in steady decline. The construction of new coal generation peaked in the 1970s and 1980s. There was a brief period of revived interest in new coal generation ten years ago, a response to high natural gas prices, but the interest in coal collapsed along with natural gas

prices. Many old, uneconomic coal-fired plants have been retired at the end of their useful lives, replaced by renewable resources, energy efficiency, and natural gas generation. Retirement of uneconomic coal generation resulting from compliance with the Clean Power Plan is consistent with these long-term trends.

14. During the comment period for the proposed Clean Power Plan rule, EPA invited comment on whether covered sources "should have the flexibility to look 'outside the fence' [of the generating unit] for the means to achieve the goals, including the use of emissions trading, and averaging."[1] NextEra strongly supported this flexibility in its comments on the proposed rule,[2] and EPA has provided such flexibility in its final rule.

15. The electric power sector has many years of experience in responding to electric system changes caused by many different factors: independent business decisions; State actions like renewable energy standards; changes in Federal and State law (e.g., Public Utility Regulatory Policies Act of 1978 requirements; FERC Order 1000 regulations, Federal mandatory reliability standards); and long-term industry trends (e.g., increasing integration of natural gas generation and renewables, retirement of uneconomic oil and coal generation).

16. The Clean Power Plan guidelines for State greenhouse gas emission

[1] 79 Fed Reg. 34830, 34848 (June 18, 2014).
[2] *See* Comments from NextEra Energy on "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Proposed Rule," docket ID. EPA-HQ-OAR-2013-0602-22763 (Dec. 1, 2014).

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targets are consistent with long-term trends in the electricity generating industry away from coal-fired units and toward cleaner sources of generation. For years renewable energy and natural gas generation have accounted for the vast majority of U.S. electricity generation addictions. Clean sources of energy have been growing, while coal generation has been in decline. The Clean Power Plan merely builds on this transition by requiring that States meet certain benchmarks to continue the trend. The Clean Power Plan will not transform the U.S. electricity sector, since it builds on long-term trends and does not alter the basic regulatory framework. The Plan may add costs for some generators and affect the competitive posture of generators and technologies, but that is no different than what occurs when fuel costs shift, such as the collapse in natural gas prices in recent years.

17. Over the last 15 years, NextEra has transitioned a significant portion of its generation portfolio from higher-emitting fossil fuels to lower-emitting natural gas and zero-emitting wind and solar. By the end of 2016, NextEra's generation portfolio will include over 15,000 MW of wind and solar generation throughout the U.S. and Canada. NextEra has achieved this transition relatively quickly and without any adverse reliability effects. This transition has been economical for our customers.

18. In order for NextEra to plan its development, capital, and maintenance

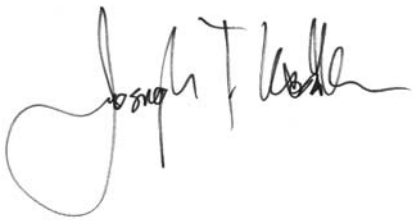
spending, to prepare all of its existing facilities, and to develop new facilities in response to markets affected by greenhouse gas regulations, it is critical that EPA provide a clear, dependable regulatory pathway for regulation of greenhouse gases from EGUs. The Clean Power Plan provides a clear glide path of emissions reductions that markets can rely upon and that NextEra can integrate into future investment decisions. Judicially staying the Clean Power Plan will cause market instability and inject significant uncertainty into NextEra's investment decisions, harming NextEra's ability to plan future spending and development.

19. The Clean Power Plan requires no action on the part of EGUs until State plans are approved by EPA. With probable extensions, these plans will not even be submitted for nearly three years and compliance is not required until 2022, seven years from now. In light of these extended planning and implementation time horizons, there is no need for owners of coal-fired generating units to make retirement decisions immediately. The immediate burden of the Clean Power Plan is limited to planning. To be sure, owners of coal EGUs must plan for possible retirement, but there is no need to make a permanent retirement decision until EPA approves Clean Power Plan compliance plans, which will be more than three years in the future. In the meantime, there are a range of measures available differently to limit emissions from higher emitting units that do not require permanent retirement decisions, such as purchasing renewable energy credits or emission

reduction credits, entering into power purchase agreements to buy renewable energy generation, and operating diversified generation fleets differently. Since the only immediate burden of the Clean Power Plan is planning and States have three years to plan, a stay during the pendency of this litigation would seem entirely unnecessary.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Washington, D.C., on December 5, 2015.



Joseph T. Kelliher

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF RANDALL R. LABAUVE

I, Randall R. LaBauve**,** hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Response in Opposition to Petitioners' Motions for Stay by NextEra Energy, Inc. ("NextEra").

2. I am Vice President of Environmental Services for NextEra. I have served in that position since July 10, 2002.

3. As Vice President of Environmental Services, I am responsible for leading the environmental strategy, licensing, compliance and environmental relations efforts for the company, including its two principal subsidiaries, Florida Power & Light Company (FPL) and NextEra Energy Resources, LLC. (NEER).

4. NextEra is a leading clean-energy company with consolidated annual

revenues of approximately $17 billion, and possesses approximately 44,900 megawatts (MW) of generating capacity, which includes megawatts associated with non-controlling interests related to NextEra Energy Partners, LP (NEP), and approximately 13,800 employees as of year-end 2014. NextEra is headquartered in Juno Beach, Florida.

5. FPL serves approximately 4.8 million customer accounts in Florida. It is the largest investor-owned electric utility in the state and one of the largest rate-regulated electric utilities in the United States. NEER is the world's largest generator of renewable energy, doing business and operating renewable energy generation facilities in over twenty-five states throughout the U.S.

6. For more than 15 years, NextEra generating companies, NEER and FPL, have been transitioning the NextEra generation profile to more efficient, lower-emitting and zero-emitting technologies. By the end of 2016, NextEra's generation portfolio will include over 15,000 MW of wind and solar generation throughout the U.S. and Canada, more than any other company in North America.

7. The Environmental Protection Agency's (EPA) "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (the "Clean Power Plan") recognizes and expands the current opportunity to reduce carbon emissions by transitioning the United States electric grid from a fossil fuel dominant fuel mix to a balanced energy portfolio that includes a higher penetration of zero-emitting renewable generation and low-emitting natural gas generation. The Clean Power Plan will require affected electric generating units ("EGUs") within each state to reduce their carbon emissions, thus presenting the

opportunity for utilities and states to choose policies that will shift electricity generation towards sources such as wind and solar energy, which generate no carbon emissions, or natural gas, which generates lower carbon dioxide emissions than coal steam generation.

8. The EPA has already recognized the importance of low- and zero-carbon energy and the role for clean or renewable energy to play in this transition. As part of the best system of emission reduction adequately demonstrated to reduce emissions from affected EGUs, EPA has included as potential state emission reduction strategies both (1) shifting generation from coal-fired EGUs to existing natural gas combined cycle EGUs; and (2) substituting more renewable energy for existing fossil fuel-fired EGUs.

9. In NextEra's view so-called "outside-the-fenceline" measures, such as adding renewable energy generating capacity to a utility's fleet, are far preferable compliance options to so-called "inside-the-fenceline" compliance measures, such as co-firing a coal-fired power plant with natural gas. While achievable, inside-the-fenceline measures, such as co-firing, are limited in terms of potential emissions reductions and generally less cost-effective, compared with outside-the-fenceline measures, which provide much more flexibility to achieve emissions reductions at the lowest possible cost.

10. Inside the fence options only present limited opportunities that are not as cost effective as other outside the fence options. NextEra has interests in coal and oil units. The efficiency of those units can be improved, but the net gain is very limited. Co-firing is a retrofit option that has not been cost effective. The best

option to improve efficiency for our fossil operations has been to add more efficient lower emitting combined cycle natural gas units, which has decreased capacity factors at less efficient coal and oil units. Also, for many sites where we have repowered existing generation with new combined cycle units, this path has resulted in the complete retirement of higher emitting older fossil generation.

11. NextEra has also completed power uprates at several of our nuclear units, which maximize the zero emitting generation from these units, again offsetting inside the fence fossil emissions at other units.

12. In Florida and around the country wind and solar generation present cost effective generation opportunities when appropriately sited in geographical areas best suited for that generation. These projects provide great flexibility to companies to select the best tool rather than force fit uneconomic projects within the fence line.

13. While EPA has not included the energy efficiency building block in the Final Rule, they do suggest it is a viable compliance option. At FPL we have and will continue to pursue cost-effective energy efficiency programs, which have helped to avoid the construction of new units and thus avoided a significant amount of carbon emissions.

14. NextEra continues to evaluate and invest in new technologies, which may present new outside the fence opportunities such as electric vehicles and battery storage technology.

15. NextEra has made and continues to make substantial investments in developing clean or renewable energy projects in electricity markets across the United States. These investments have kept our customer's costs low and reliability of

service high. As a result of NextEra's emissions reduction measures over the past 15 years, NextEra's fleet-wide carbon dioxide emissions rate is 35% below the industry average in the U.S.

16. FPL has accomplished reductions in carbon dioxide emissions by decommissioning older inefficient power plants and replacing them with natural gas-fired electric generation that has reduced our annual oil consumption from 40 million barrels per year to less than 1 million barrels per year. FPL currently operates 110 MW of solar generation. By 2016 FPL will add an additional 250 MW of new solar to its portfolio. Recently, FPL received approval to purchase a coal-fired generating plant that FPL will retire, saving our customers approximately 70 million dollars and eliminating an average of at least 650,000 tons of carbon dioxide emissions annually.

17. FPL achieves a low greenhouse gas emissions rate while providing 64% of Florida's electricity needs. FPL's 2012 baseline emission rate under the Clean Power Plan (i.e., its actually emissions rate in 2012) is 903 pounds of carbon dioxide per megawatt hour, which is already below the 2030 blended target rate of 919 pounds of carbon dioxide per megawatt hour that EPA established for the state of Florida.

18. FPL delivers better than 99.98% service reliability with its low-carbon generating fleet. FPL has the highest reliability rating, the cleanest emissions and is the lowest cost investor-owned electric utility in the state. Our customer electric bills range from 15-35% lower than the other three large investor owned utilities serving Florida.

19. Since the 1980s, NEER has invested more then $20 billion in wind power and now operates approximately 11,400 MW of wind power, enough to power

the city of Chicago, from facilities throughout North America, including in Oklahoma, Colorado, and Texas. NEER generates solar energy at three sites in California and plants in New Jersey, New Mexico, and Nevada.

20. NEE's transition to one of the cleanest electric generators in the country has been accomplished without a legislative or regulatory mandate to do so while bringing extraordinary value to our customers and shareholders. In 2014, NEE outperformed our peers and the S&P 500 by delivering a 10-year total shareholder return of 300%, including a total of 151% over the Electric Utilities index.

21. There are 15 years from now until full implementation of the Clean Power Plan in 2030. Based on our experience, NextEra believes that compliance can be achieved across the country within that time. Through deliberate decisions to improve the efficiency of our nation's generation by switching fuels and reducing emissions, by building new transmission and natural gas pipeline access, and building new renewable generation, we believe the U.S. electric sector can cost-effectively achieve the emissions reductions required by the Clean Power Plan.

22. NextEra's success in increasing zero- and low-carbon generation demonstrates that others in the electricity sector can deliver affordable, reliable energy to their customers by displacing older, inefficient power plants as a means of complying with the Clean Power Plan.

23. The Clean Power Plan provides a clear, dependable, and achievable, regulatory pathway for the control of greenhouse gas emissions. In order for NextEra to plan its development, capital, and maintenance spending, to prepare all of its existing facilities, and to develop new facilities in responses to markets affected by the

new greenhouse gas regulations, it is of critical importance that the Clean Power Plan remain in effect during this litigation.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Juno Beach, Florida on December 4, 2015.



Randall R. LaBauve

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF MELISSA LAVINSON

I, Melissa Lavinson, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am Chief Sustainability Officer and Vice President of Federal Affairs and Policy at PG&E Corp. I am providing this declaration in support of the Power Companies' response in opposition to the motions for stay filed by several Petitioners in the above-captioned litigation.

2. Incorporated in California in 1905, Pacific Gas and Electric Company ("PG&E") is among the largest combined natural gas and electric utilities in the United States, providing electric and gas service to approximately 16 million people throughout a 70,000-square-mile service area spanning Northern and Central California.

3. PG&E owns and operates more than 7,500 MW of generating capacity across a diverse mix of hydropower, gas-fired, renewable and nuclear generating units. Among its fleet, PG&E owns and operates two highly efficient gas-fired combined cycle power plants—the 657-MW Colusa Generating Station and the 580-MW Gateway Generating Station—each of which consists of affected EGUs subject to the Clean Power Plan. PG&E's overall generating fleet has the lowest carbon intensity among the 25 largest generators (excluding federal operators of hydropower projects),[1] and a carbon dioxide ("CO_2") emissions rate for delivered electricity that is roughly two thirds cleaner than the national utility average. These rates are indicative of PG&E's long-standing commitment to reducing greenhouse gas ("GHG") emissions across its generation portfolio.

4. In step with this commitment, PG&E was recently among 81 companies signing on to the White House's American Business Act on Climate Pledge, which is

[1] Natural Resources Defense Council et al., Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, at 10 (2015), *available at*: http://www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2015.pdf (indicating that PG&E was the 24th largest generator based on 2013 generation data, with a carbon intensity for all generating sources lower than all others among the 25 largest generators, except for the U.S. Army Corps of Engineers).

aimed at solidifying the support of major U.S. companies for urgent action on climate change and for an agreement that will achieve meaningful GHG reductions at the 2015 United Nations Climate Change Conference in Paris. As reflected in its pledge, PG&E plans to increase the amount of electricity it delivers from CO_2-free resources to 60 percent by 2020 and, in so doing, establish its portfolio as among the cleanest of any investor owned utility in the country. PG&E also pledged to continue its leadership in energy efficiency by assisting its customers in achieving approximately 4,400 gigawatt-hours of electricity savings by 2020.

5. PG&E also pledged to work with the state of California and other stakeholders to assure effective implementation of the U.S. Environmental Protection Agency's ("EPA") Clean Power Plan ("Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015)). PG&E was supportive of the Clean Power Plan in its proposed form, submitting comments with other California utilities and utilities with significant hydropower assets.[2] In its comments on the proposed rule in 2014, PG&E, along with other California utilities, expressed their collective support for the "broad flexibility" the proposed Clean Power Plan afforded states to achieve their respective CO_2 emission performance goals.[3]

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[2] Letter from Janet Loduca, Vice President, Safety, Health, and Environment, Pacific Gas and Electric Company, et al. to EPA (Dec. 1, 2014) EPA-HQ-OAR-2013-0602-23198 (joint comments on proposed CPP by several California utilities, including PG&E); Letter from Dave Robertson, Portland General Electric, VP, Public Policy, et al. to EPA (Nov. 25, 2014) EPA-HQ-OAR-2013-0602-22528 (joint comments on proposed CPP by utilities including PG&E and Seattle City Light).

[3] *See* Letter from Janet Loduca, Vice President, Safety, Health, and Environment, Pacific Gas and Electric Company, et al. to EPA, at 13 (Dec. 1, 2014) EPA-HQ-

6. PG&E appreciates the even greater flexibility afforded by the final Clean Power Plan, including the opportunities it provides for states to achieve their respective goals through interstate trading of allowances. PG&E believes that market-based trading programs are a demonstrated means of achieving emissions reductions within the power sector. PG&E has been instrumental in supporting California's successful implementation of its groundbreaking climate initiatives, including the Cap-and-Trade Regulation promulgated pursuant to California's Assembly Bill 32. By building upon these existing initiatives and providing states broad flexibility to utilize different approaches, including allowance trading, the Clean Power Plan represents a reasonable means of achieving meaningful and cost-effective reductions in CO_2 emissions from the power sector.

7. California has indicated that it anticipates the Cap-and-Trade Regulation will play a central role in the compliance plan it submits to the EPA pursuant to the Clean Power Plan.[4] PG&E believes that larger and more diverse emissions trading markets could enhance the prospects for efficient market outcomes, leading to lower-cost emission-reduction opportunities, while maintaining the environmental integrity of state and federal programs. PG&E has therefore encouraged California to explore linkage opportunities between California's and other state programs as a means of

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OAR-2013-0602-23198 (joint comments on proposed CPP by several California utilities, including PG&E).

[4] *See* Clean Power Plan Compliance Discussion Paper, California Air Resources Board, at 2 (Sep. 2015) (hereinafter, "Discussion Paper"), *available at*: http://www.arb.ca.gov/cc/powerplants/meetings/2015whitepaper.pdf.

achieving cost-effective reductions.[5] PG&E is confident that emissions markets will develop throughout the U.S. pursuant to the Clean Power Plan and provide a pathway for affected EGUs to achieve the Clean Power Plan's emission reduction goals, without impairing the reliability of the electricity grid or the functioning of power markets. PG&E is also optimistic that linkages will evolve through adoption of "trading-ready" programs and that such linkages could enable uniform carbon pricing across state lines, which will promote efficient dispatch and investment within power markets.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.



Melissa Lavinson

[5] *See*, *e.g.*, Letter from Mark C. Krausse, Senior Director, State Agency Relations, Pacific Gas and Electric Company, to Mr. Craig Segall, Senior Staff Counsel, California Air Resources Board, at 3 (Oct. 26, 2015), *available at*: http://www.arb.ca.gov/lists/com-attach/13-111dcompliance-ws-VycBYAFlAAxSNwBv.pdf.

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF CHERYL MELE

I, Cheryl Mele, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am Chief Operating Officer at Austin Energy. I am providing this declaration in support of the Power Companies' response in opposition to the motions for stay filed by several Petitioners in the above-captioned litigation.

2. Founded by the City of Austin in 1895, Austin Energy is the nation's eighth largest municipally-owned electric utility. With a mission of delivering clean,

affordable, reliable energy and excellent customer service, Austin Energy provides electricity to more than 448,000 customers and a population of nearly one million inside the city of Austin and in surrounding communities within Travis and Williamson Counties. Austin Energy's annual revenues exceed $1.29 billion, which entirely fund its operations and provide a return to the City of Austin.

3. Austin Energy oversees a diverse mix of nearly 3,500 megawatts ("MW") of total generation and purchased power capacity. It operates several gas-fired EGUs, including affected EGUs subject to the Clean Power Plan such as its 927-MW Decker Creek Power Station and the 570-MW Sand Hill Energy Center. Austin Energy also owns a share of a coal-fired and a nuclear-fired plant (the Fayette Power Project and the South Texas Power Project, respectively). Presently, Austin Energy's generation portfolio also includes nearly 1,000 MW of renewable generation capacity, including utility-scale wind, solar, and biomass resources.

4. Through the Austin Climate Protection Plan first adopted in 2007, Austin Energy will achieve significant greenhouse gas ("GHG") reductions, with a goal of reducing CO_2 power plant emissions by 20 percent below 2005 levels by 2020. To that end, Austin Energy aims to meet 55 percent of energy needs from renewable resources by 2025. Indeed, last year Austin Energy signed a 20-year contract for 150 MW of solar capacity, and this year signed additional long-term contracts for another 438 MW of solar capacity, all at competitive prices that will allow it to maintain affordable service for its ratepayers. Austin Energy will also achieve significant reductions through its energy efficiency and demand side management efforts, which will achieve 800 MW of peak demand savings by 2020.

5. Austin Energy supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan"), and has actively supported EPA's efforts to reduce CO_2 emissions from the power sector, submitting detailed comments on the proposed Rule.[1]

6. Austin Energy believes the Clean Power Plan aligns well with the forward-thinking goals of the City of Austin to reduce its carbon footprint, and that the goals of the Clean Power Plan are achievable by utilities. In that regard, the City of Austin anticipates that its existing goals and efforts to achieve those goals will go far towards complying with whatever requirements should ultimately be imposed pursuant to the Clean Power Plan.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.

Cheryl Mele

Cheryl Mele

[1] Letter from Kathleen Garrett, Director of Environmental Services, Austin Energy to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602-22814; Austin City Council Resolution No. 20140612-069

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF RONALD O. NICHOLS

I, Ronald O. Nichols, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information, and belief:

1. I am senior vice president of Regulatory Affairs and Nuclear for Southern California Edison Company ("SCE"). I am responsible for regulatory policy and affairs, regulatory operations, and environmental affairs.

2. SCE is one of the largest electric utilities in the United States, serving more than 15 million people in a 50,000-square-mile area of southern California. SCE has provided electric service in the region for over 125 years and in 2014 delivered more than 88 million megawatt-hours ("MWh") of electricity to our customers.

3. SCE supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) (hereinafter, "Clean Power Plan"). SCE supported the Clean Power Plan in its proposed form through submission of comments as part of multiple groups.[1] SCE's continued support for the final Clean Power Plan reflects our belief that it provides the flexibility necessary for states and owners of affected electric generating units to implement proven strategies that are already achieving reductions in the industry.

4. SCE has made significant progress in reducing emissions and expanding renewable generation, while at the same time maintaining affordable service for customers. In 2014 alone, SCE delivered approximately 17.7 million MWh of renewable power from geothermal, biomass, solar, wind, and small hydropower

[1] Letter from Janet Loduca, Vice President, Safety, Health, and Environment, Pacific Gas and Electric Company, Caroline Choi, Vice President, Integrated Planning and Environmental Affairs, Southern California Edison Company, et al. to EPA (Dec. 1, 2014) EPA-HQ-OAR-2013-0602 (joint comments on proposed CPP by several California utilities, including SCE); Letter from Dave Robertson, Portland General Electric, VP, Public Policy, et al. to EPA (Nov. 25, 2014) EPA-HQ-OAR-2013-0602 (joint comments on proposed CPP by several utilities, including SCE); Letter from Donald Gilligan, President, National Association of Energy Service Companies to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602 (members include SCE).

sources, equating to roughly 23.5 percent of all the electricity delivered by SCE last year.

5. SCE also owns and operates the Mountainview Generating Station, a 1050-MW natural gas-fired combined cycle facility that first went into operation in 2006 and consists of affected electric generating units subject to the Clean Power Plan.

6. SCE has invested extensively in energy efficiency programs. In the past five years, SCE's partnership with our customers has resulted in savings of over 7.6 million MWh. Energy conservation from SCE's installation of smart meter technology alone is anticipated to reduce greenhouse gas emissions and smog-forming pollutants in excess of 365,000 tons annually.

7. SCE's experience in reducing emissions across our portfolio and in complying with California's cap-and-trade program implemented under Assembly Bill 32 has informed our belief that the reduction obligations required by the Clean Power Plan are readily achievable by utilities and generators, and can be accomplished while maintaining system reliability and affordable rates for consumers.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.



Ronald O. Nichols

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422, 15-1432)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF EDWARD A. WELZ

I, Edward A. Welz, do hereby declare that the following statements made by me under oath are true and accurate to the best of my knowledge, information and belief:

1. I am Executive Vice President and Chief Operating Officer of the New York Power Authority ("NYPA"). Established by Governor Franklin D. Roosevelt through legislation signed in 1931, NYPA is the largest state power organization in

the United States, providing electricity to governmental customers, businesses and municipal and cooperative electric systems.

2. NYPA owns and operates 16 generating facilities, producing an electricity mix that is comprised of approximately 71 percent clean, renewable hydropower. This includes power produced from NYPA's St. Lawrence-Franklin D. Roosevelt Power Project, the Niagara Power Project, the Blenheim-Gilboa Pumped Storage Power Project, and smaller hydropower facilities elsewhere throughout the state of New York.

3. Among NYPA's fleet are electric generating units that will be directly affected by the Clean Power Plan, including NYPA's 500-MW combined cycle plant located in Astoria, Queens, and the Richard M. Flynn Power Plant, a 135-MW combined cycle plant that has been producing power on Long Island since 1994.

4. NYPA supports the final rule issued by the U.S. Environmental Protection Agency ("EPA") entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 80 Fed. Reg. 64,662 (Oct. 23, 2015) (hereinafter, "Clean Power Plan" or "Plan"). NYPA participated extensively in the Clean Power Plan's development, submitting comments both separately and as a part of multiple coalitions.[1] NYPA continues to support the Clean

[1]Letter from Jeffrey C. Cohen, Director, Legislative & Regulatory Affairs, New York Power Authority to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602; Letter from Paul L. Gioia, Whiteman Osterman & Hanna LLP, Attorney for New York Transmission Owners to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602 (comments by numerous transmission owners, including NYPA); Letter from RGGI Rules Collaborative to EPA (Nov. 2014), EPA-HQ-OAR-2013-0602 (endorsees include NYPA, National Grid, and Calpine); Letter from Roger Caiazza, Director, Environmental Energy Alliance of New York to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602 (Alliance

Power Plan as a reasonable, legally-defensible approach to reducing carbon dioxide ("CO_2") emissions throughout the power sector.

5. In particular, NYPA supports the Clean Power Plan for the flexibility provided to individual states in crafting and submitting implementation plans to achieve the Plan's emission reduction requirements. NYPA supported this flexibility in our comments on the proposed Clean Power Plan.[2] The flexibility afforded by the final Clean Power Plan allows states to incorporate existing programs with demonstrated success in reducing emissions from the power sector as part of state implementation plans.

6. One such program is the Regional Greenhouse Gas Initiative ("RGGI"), the nation's first multi-state cap-and-trade program to reduce CO_2 emissions. NYPA participates in RGGI, which requires electricity generators to hold CO_2 allowances sufficient to cover total CO_2 emissions. NYPA has participated in program auctions and has found costs for allowances to be reasonable and allowances to be consistently available when needed to cover emissions from NYPA's fleet.

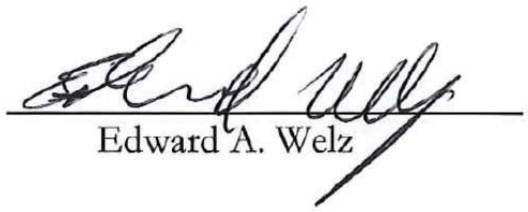
7. As a result of RGGI's success in demonstrating how market-based trading programs can be relied upon to reduce CO_2 emissions from the power sector, NYPA anticipates that similar emissions markets will likely develop and provide a pathway to compliance with the future reduction obligations of the Clean Power Plan.

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members include NYPA and National Grid); Letter from Donald Gilligan, President, National Association of Energy Service Companies to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602 (members include NYPA, PG&E, and SCE).

[2] *See* Letter from RGGI Rules Collaborative to EPA (Nov. 2014), EPA-HQ-OAR-2013-0602; Letter from Roger Caiazza, Director, Environmental Energy Alliance of New York to EPA (Dec. 1, 2014), EPA-HQ-OAR-2013-0602.

I declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the foregoing is true and correct. Executed on December 7, 2015.



Edward A. Welz

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Case No. 15-1363 and Consolidated Cases

STATE OF WEST VIRGINIA, *et al.*,
Petitioners

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Respondents

JOINT ADDENDUM:

Exhibits in Support of Movant Respondent-Intervenors' Responses in Opposition to Motions for Stay

Part D

Declarations in Support of Energy Trade Association Intervenors

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF GABRIEL ALONSO IN SUPPORT OF AWEA RESPONSE IN OPPOSITION TO PETITIONER'S MOTION TO STAY BY RESPONDENTS-INTERVENORS

I, Gabriel Alonso, declare as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors.

2. I am Gabriel Alonso, Chief Executive Officer of EDP Renewables North America LLC. I manage the overall operations and resources of the company and make major corporate decisions for this renewable energy company. I hold a law degree and a Master of Science degree in economics, each from the

University of Deusto in Spain, and have completed the Advanced Business Management Program at the University of Chicago Booth School of Business.

3. I have worked for more than 15 years in the renewable energy industry with experience in North America, Europe and North Africa. I led the acquisition of Horizon Wind Energy by EDP in 2007 and have overseen growth from 800 megawatts of operating capacity to over 4,000 megawatts operating across 30 windfarms stretching from Oregon to New York. EDP Renewables North America is the third largest wind energy operator in North America.

4 My declaration is based on my direct experience as a professional responsible for the marketing, development, construction, and operations of windfarms across the United States.

5. I am supplying this declaration at the request of movant-intervenors the American Wind Energy Association ("AWEA").

6. The purpose of my declaration is to provide information to the Court relating to the question of whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

7. In preparation for this declaration, I have become familiar with: (a) the Clean Power Plan; (b) the Petitions for Stay; and (c) the declarations thereto. In addition, I am acquainted with the other documents cited in this declaration.

There Is Adequate Existing Wind Generation in the Development Pipeline and New Wind Can Be Added Quickly So Utilities Do Not Need to Incur Project Development Costs in the Near Future

8. Petitioners have requested a stay of the Clean Power Plan. Petitioners claim that their affected industries will be immediately harmed by the Clean Power Plan. I do not believe that the Clean Power Plan will cause the Petitioners to engage in either significant retirements of existing electric generating units or investments in alternative sources of generation during the litigation period due to the uncertainty surrounding state plans and the long lead time available to states in developing final compliance plans.

9. The claim in the Petitioners' briefs and declarations that states and utilities will need to incur immediate costs to begin developing low-carbon generation to comply with the Clean Power Plan is incorrect for a number of reasons.

10. Wind developers currently have a backlog of dozens of gigawatts of proposed wind projects that can be built quickly, as time-intensive steps such as resource assessment, permitting, and interconnection studies have already been completed. For instance, my company currently owns the rights to over 30 projects in the United States, approximately two to three gigawatts of additional capacity, in the early stages of development. While the decision to build any or all of this new capacity depends on several factors, this should serve as an indicative figure to demonstrate that opportunities to utilize wind for Clean Power Plan compliance will be plentiful.

11. In addition, the full development cycle for a wind project is sufficiently short so that even projects for which no development steps have begun could be

brought online before the start of Clean Power Plan compliance requirements. As a result, there will be no shortage of wind projects available for utilities to use for Clean Power Plan compliance if they chose to do so in the future. In my experience, typical new, prospective projects in the EDP Renewables portfolio require between two and four years of active development time to reach commercial operation.

12. Nearly all wind projects are developed by private developers, such as my company, so no cost or risk is incurred by the utility until a PPA to buy the output of the wind project or a contract to purchase the wind project is signed. The signing of a PPA or a wind project purchase agreement typically occurs one or two years prior to a wind project's in-service date, and sometimes even after a wind project has become operational. An example of both the former and the latter may be helpful in illustrating this behavior. Amazon Web Services, Inc., a subsidiary of Amazon.com, signed a long-term PPA for the 100 megawatts of capacity from our upcoming Timber Road III Wind Farm in Paulding County, Ohio on November 19, 2015. This wind farm is expected to reach full commercial operation during November 2015, approximately a year after the PPA was signed. Signing a PPA in advance of construction is commonplace – as noted previously, nearly 555 megawatts of capacity have a PPA but have not yet begun construction. As for the latter, EDPR signed a PPA during September 2015 with an energy trading firm for the sale of power of the currently operational Top Crop II Wind Farm. These examples are typical and represent the vast majority of EDPR's North American PPA origination

operations.

13. Because either signing a PPA or purchasing a late-stage wind project from a developer is always an option for a utility, no utility can correctly argue that they must incur cost or risk in the next several years for developing wind projects for Clean Power Plan compliance. Real-world experience demonstrates that utilities can add a large amount of wind generation to their portfolios in a short period of time and without incurring any cost prior to signing a purchase contract (either a PPA or direct project ownership), which indicates that a stay is not necessary for utilities to avoid near-term development costs for generation to comply with the Clean Power Plan. Moreover, for approximately half of the fifteen percent of wind capacity that is directly owned by utilities, the projects were initially developed by a private wind developer and sold to the utility at a later date.

14. Therefore, for the vast majority of wind projects, the utility incurs no cost or risk for developing a wind project until very late in the development process, ensuring that utilities need not incur any costs for procuring generation to comply with the Clean Power Plan until many years from now, at the earliest. This is true regardless of whether a utility pursues direct wind project ownership or a PPA.

15. Most wind project PPAs are signed very late in the wind project development process, sometimes even after a wind project has become operational. As the wind industry has matured, wind project developers have gained greater access to capital markets, enabling developers to secure financing to build wind

projects for which they have not yet secured a classic long-term PPA.

16. As a result, at this point in time a utility can wait at least several more years to sign a contract for wind generation and still have that wind generation online by the 2022 start of the Clean Power Plan compliance time period. In short, the claims made by the Petitioners' declarants about the lengthy amount of time it takes to procure new low-carbon generation, such as wind energy, are unfounded.

Transmission Is Not a Limiting Factor for Clean Power Plan Compliance

17. Some of the Petitioners' briefs and declarations claim that the lead time to build transmission requires immediate action, and cost, to begin planning transmission that will be needed for Clean Power Plan compliance. This claim is unfounded.

18. Based on my experience, there is a large amount of new transmission that will support the generation changes associated with the Clean Power Plan, including both coal retirements and the addition of natural gas generation and zero-carbon generation. While transmission expansion might be important for the most cost-effective compliance with the Clean Power Plan in the long-term, it is not essential in the near-term because sufficient resources can be deployed to comply with the Clean Power Plan interim targets without new transmission in place.

19. Many near-term transmission projects that will support the generation changes associated with the Clean Power Plan are already well underway. As a result, Petitioners' claims that they will not be able comply with the Clean Power Plan

unless they immediately invest in planning and permitting additional transmission infrastructure are incorrect.

20. My company has identified many near-term transmission projects that can support a large build out of additional wind capacity. Many of these transmission projects are currently under construction or have received all necessary permits, including nearly all of MISO's Multi-Value Projects, which alone are expected to enable 43 million MWh of additional wind supply across the MISO footprint, the approximate output of around 14,000 MW of new wind capacity.

Electric Reliability Is not a Concern and will not Cause Near-Term Costs for States and Utilities

21. The Petitioners argue that the Clean Power Plan will harm consumers because it will threaten the reliability of the electricity system. Changes in the generation mix associated with the expanded use of wind energy will not harm electric reliability. Many utilities and grid operators already reliably obtain a large share of their electricity from wind energy, and comprehensive studies indicate far more wind energy than is needed for Clean Power Plan compliance can be integrated without any reliability concerns. These studies and operating experience have shown that wind energy's impact on the total power system need for flexible operating reserves is far smaller than that caused by the abrupt failures of large conventional power plants.

22. Concerns expressed by several of Petitioners' declarants about the reliable integration of renewable energy are contradicted by utilities' real-world experience with reliably integrating large amounts of wind energy. Several of

the RTOs in which EDP Renewables operates wind farms have studied and made changes to their operating protocols for variable generation sources, such as wind and solar, to improve the reliability of their systems. For instance, ERCOT ISO implemented changes to their dispatch protocol for wind plants in 2013 and 2014. Prior to these changes, our Lone Star wind farms in ERCOT's western zone experienced a loss of output of approximately 10% of annual generation due to system reliability curtailments. The recent improvements in the operating protocol in ERCOT have eliminated these curtailment losses to almost zero. With improvements in ISO/RTO operating protocols are essentially solving much of the integration issues with wind and solar, ISO/RTO studies indicate that significantly higher generation from variable sources can be reliably integrated. For instance, PJM, an RTO managing almost a quarter of the national electrical consumption annually, conducted a renewable integration study in 2014 to understand the impacts to grid operations if renewable energy goals over the next fifteen years are achieved or exceeded. The study summary states, "The study findings indicate that the PJM system, with adequate transmission expansion and additional regulating reserves, will not have any significant issues operating with up to 30% of its energy provided by wind and solar generation." Further, "Additional regulation was required to compensate for the increased variability introduced by the renewable generation. The 30% scenarios, which added over 100,000 MW of renewable capacity, required an annual average of only 1,000 to 1,500 MW of additional regulation compared to the roughly 1,200 MW of regulation modeled for load

alone. No additional operating (spinning) reserves were required."

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 7th day of December, 2015, in Houston, TX.

Signature

Name of Declarant: Gabriel Alonso Imaz
Chief Executive Officer

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF JUSTIN BACA

I, Justin Baca, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Response by Proposed Respondent-Intervenor Solar Energy Industries Association ("SEIA") in Opposition to Petitioners' Motions for Stay.

2. I am Senior Director of Research for SEIA. I have served in that position since July 2015 and have served in similar positions within SEIA since July 2008. I oversee all market research and policy analysis at SEIA. This includes the collection of raw data on industry activity such as business locations and deployment data. This data along with knowledge about industry trends, policy environment, electricity market and financing, forms the basis of the solar market analysis at SEIA. My position gives me substantial expertise on the current economics and state of

deployment of solar power installations around the country and elsewhere in the world.

3. Based on my experience, and contrary to the assertions of many of Petitioners' declarants, the requirements of the Clean Power Plan final rule can be met without adverse impact on reliability or costs of electric power generation.

4. Increased reliance on solar energy is a cost-effective method of compliance. The cost of solar energy has fallen dramatically over the past several years to the point where solar energy is in many cases cheaper than energy from coal-fired electric generating units (EGUs).

5. A November 2015 report from Lazard shows that the levelized cost of energy (LCOE)[1] from utility solar photovoltaic (PV) generation has dropped from over $300 per megawatt-hour (MWh) in 2008 to as low as $43 per MWh in 2015.[2] This same analysis shows that solar costs have fallen to the point where solar is now less expensive than combustion turbine peaker plants and, in many places less expensive than new coal plants whose cost ranges from $65 per MWh to $150 per MWh.[3]

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[1] The LCOE represents the per-kilowatt hour cost of building and operating a generating plant over an assumed financial life and duty cycle. It includes capital costs, fuel costs, fixed and variable operations and maintenance costs, financing costs, and an assumed utilization rate for each type of plant. http://www.eia.gov/forecasts/aeo/electricity_generation.cfm.

[2] "Lazard's Levelized Cost of Energy Analysis – Version 9.0" November 2015, pages 2 and 10. https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf

[3] "Lazard's Levelized Cost of Energy Analysis – Version 9.0" November 2015, page 2. https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf

6. There is a continuing downward trend in the amount of electric power generated by coal-fired EGUs, which is caused by other factors independent of the Clean Power Plan. The dirtiest of existing coal power plants are old and largely depreciated, and many are expected to be either retired or repowered soon regardless of the Clean Power Plan. Thus the relevant question is whether they will be replaced with new coal, other fossil fuels, or renewable generation. As demonstrated above, solar is highly competitive with, and in many cases cheaper than, other technologies.

7. For example, in its most recent resource plan approved by the Colorado Public Utilities Commission, Xcel Energy Colorado included 170 megawatts (MW) of solar and 450 MW of wind as part of its most cost-effective resource mix along with natural gas. This plan will replace old coal generation. According to Xcel, the decision was made purely for economic reasons. The notion that coal-fired EGUs provide the cheapest form of energy available is no longer true.

8. Additionally, states are recognizing the risk of extreme spikes in commodity prices associated with fossil fuels as occurred during the 2014 Polar Vortex in the Northeastern United Sates. To protect against this risk, states are increasingly turning to solar energy for long term contracts in which the fuel is free and the price of energy is set over the length of the contract, often 20 to 30 years.[4] Additionally, the modularity and distributed capabilities of solar energy allows

[4] Utility-Scale Solar 2014: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States (Lawrence Berkeley National Laboratory September 2015) (https://emp.lbl.gov/sites/all/files/lbnl-1000917.pdf)

customers to hedge against price shocks and even power failures associated with traditional centralized fossil fuel resources.[5]

9. The addition of solar energy to a grid has other added benefits to consumers. The price of energy in contracts signed by utilities and large commercial customers has been steadily declining. The presence of significant solar deployment in competitive markets tends to push down the spot market price of electricity during the hours when solar power is providing generation.[6] Additionally, solar energy can bring significant benefits to the grid including avoided line losses, capacity value, reliability benefits, grid congestion relief, avoided distribution system upgrades, and others.[7]

10. Numerous robust studies confirm that electric grids can incorporate relatively high amounts of solar reliably. Germany already manages its grid effectively with 6% of its electricity coming from solar (a level roughly six times higher than the current level in the U.S.).[8] Likewise, the states of California, Arizona, and Hawaii all

[5] See CASE 14-M-0101 - Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Instituting Proceeding at 5 citing value of distributed renewable resources to protect ratepayers against price shock from events such as Polar Vortex (file://p-rofiles/userprofiles$/RUmoff/Downloads/%7B9CF883CB-E8F1-4887-B218-99DC329DB311%7D%20(3).pdf)

[6] These hours need not be limited to daylight or sunny hours for utility scale solar generating facilities because of energy storage capabilities that can extend the ability to feed electricity into the grid by six or more hours.

[7] http://www.irecusa.org/2013/10/experts-propose-standard-valuation-method-to-determine-benefits-and-costs-of-distributed-solar-generation/

[8] https://www.ise.fraunhofer.de/en/publications/veroeffentlichungen-pdf-dateien-en/studien-und-konzeptpapiere/recent-facts-about-photovoltaics-in-germany.pdf

currently generate more than 5% of their electricity with solar.[9] Each of those states has plans to add more solar (with California now requiring 50% renewables and Hawaii now targeting 100% renewables), confirming that relatively high amounts of solar power are considered reliable and cost-effective and that grids will continue to function reliably with higher amounts of solar. The levels of solar and wind deployment envisioned under the Clean Power Plan by 2030 are not aggressive relative to levels already operating in several states and countries.

11. The National Renewable Energy Laboratory (NREL) has done extensive modeling of grid operations with significant wind and solar generation and found that in such scenarios the grid will operate reliably. NREL has summarized its own work as well as the work of many others specifically to inform policymakers, regulators, and grid operators of the existing body of work demonstrating how the grid will work with significant penetration of wind and solar generation in "Relevant Studies for NERC's Analysis of EPA's Clean Power Plan 111(d) Compliance."[10]

12. Likewise, the nation's largest Independent System Operator, PJM, released an analysis of how it would manage higher levels of wind and solar deployment in its territory and found no significant reliability concerns.[11] And NREL's Renewable Energy Futures Study, which included sophisticated powerflow modeling of the U.S. electric grid, found that it could accommodate an energy mix

[9] https://www.greentechmedia.com/articles/read/us-solar-electricity-production-50-higher-than-previously-thought
[10] http://www.nrel.gov/docs/fy15osti/63979.pdf
[11] http://www.pjm.com/~/media/committees-groups/subcommittees/irs/postings/pris-executive-summary.ashx

with as much as 80% of generation from renewables, far more than would be necessary to meet the objectives of the Clean Power Plan.[12]

13. Assertions that solar and other renewable sources of electricity are too variable to comprise a significant portion of a grid—and, therefore, that the Clean Power Plan's standards are too stringent to be met—show a fundamental lack of understanding of how the electric system works and ignore the inherent safeguards built into grids to ensure reliability. Electric grids have always been built to handle variation. This is because load (the amount of electricity being demanded at any given time) varies all the time due to electricity usage patterns; air conditioners kick on in the morning, people go to work where they use lights computers and major equipment. The grid handles variation in load and the addition of solar and wind generation to the grid represents a change in the net load[13] on the grid. Moreover, like customer load, wind and solar generation can be and are already forecast using existing tools employed by grid operators. Interestingly, coal EGUs are currently among the least flexible grid assets since they cannot be ramped quickly, requiring other, more responsive units, to follow load for them. Removing inflexible, baseload coal from grids could actually increase grid flexibility. In fact, states such as New York, Massachusetts, California, and Minnesota are engaged in regulatory proceedings to encourage more distributed and variable resources on the grid in recognition of the

[12] http://www.nrel.gov/analysis/re_futures/

[13] "Net load" is the total electric demand in the system minus wind and solar generation. Source: https://www.eia.gov/todayinenergy/detail.cfm?id=19111

value these resources bring to grid operations, carbon reductions, and reduced costs for ratepayers.[14]

14. The typically relatively small size of individual solar power plants provides other important advantages relative to larger coal-fired plants. Aside from dealing with the normal day-to-day variations in load or net load, electric grids are also designed with reserve margins meant to survive the loss of major grid assets. That is, grids are designed to maintain service when the largest generator or largest power line goes down unexpectedly, no matter the source of generation (e.g. solar, coal, or natural gas). Since solar power plants are smaller than the margins already provided for grid reliability, they do not detract from reliability.

15. Further, solar plants are more modular than fossil fuel plants. The power block size (defined by inverter size) for all but a few solar power plants is much smaller than the power block (defined by individual generators) at fossil fuel power plants. Since the loss of a solar power block would affect a much smaller portion of plant generation capacity, solar plants are inherently less likely to cause major service disruptions than are large fossil plants.

16. Additional power generation from solar will not adversely affect reliability and will not impose significant additional costs on the electricity sector or consumers. To the contrary, market mechanisms developed under the Clean Power

[14] California's Distributed Resource Planning Proceeding; New York's Reforming the Energy Vision Reforms; Massachusetts' Grid Modernization Docket; Minnesota's Grid Modernization and E21 Initiatives (See Ceres Pathway to a 21st Century Electric Utility November 2015 at 25) (https://www.ceres.org/resources/reports/pathway-to-a-21st-century-electric-utility/view)

Plan could result in market scale that would facilitate further reductions in the cost of solar. In any case, because compliance with the Clean Power Plan does not begin until 2022, changes in grid operation that are driven by the Clean Power Plan are years away, giving even the most unprepared entities adequate time to learn how to manage a cleaner grid reliably and cost-effectively, from the utilities and states that already do exactly that.

Executed at Syracuse, NY on December 3, 2015.



Justin Baca

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF RICHARD W. CAPERTON
ON BEHALF OF OPOWER

I, Richard W. Caperton, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am the Director of National Policy and Partnerships at Opower. In this role I lead the company's engagement with the federal government on issues that impact our market.

2. Opower (NYSE: OPWR) is an enterprise software company that is transforming the way utilities engage with their customers. Opower's customer engagement platform enables utilities to reach their customers at moments that matter through proactive and digitized communications that drive energy savings, increase customer engagement and satisfaction, and lower customer operation costs. Opower's software has been deployed to more than 95 utility partners around the world and reaches more than 57 million households and businesses. Many of these 95 utilities will be directly regulated under the Clean Power Plan. One impact of our software is that it helps mass-market energy consumers use less energy, which will help our utility clients reach targets laid out by the Clean Power Plan.

3. Opower is a member of Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in connection with proposed-intervenor AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan").

4. The Clean Power Plan sets guidelines for States in developing plans to reduce carbon dioxide (CO_2) emissions. Although Petitioners focus on the Clean Power Plan's contemplated reduction of generation from coal-fired plants and replacement with generation from gas and renewable sources, owners and operators of fossil fuel-fired EGUs can also comply with the Clean Power Plan by replacing energy generation with reduced consumption through end-use energy efficiency measures. Opower is delivering significant energy efficiency savings today by giving energy users information on their energy use and advice for using less. Opower's experience in the industry demonstrates that energy efficiency measures can result in significant emission reductions in a cost-effective and timely fashion.

5. Since our founding in 2007, we have helped consumers reduce their energy use by more than 8 million kilowatt-hours. This translates to more than 6 million metric tons of CO_2 reductions.[1] As an example of how we have achieved these results, consider our work with National Grid in Massachusetts. National Grid uses Opower's software to combine energy usage data with publicly available information to tell utility customers how their usage compares to similar households and give customers targeted tips to use less energy. Armed with this information, National Grid's customers have embraced more efficient behavior to

[1] Opower's current aggregate results are tracked on our homepage: https://opower.com/.

reduce their electric usage by 300 million kilowatt-hours and their gas usage by 18 million therms, leading to $70 million in bill savings.[2]

6. These savings are measured with randomized control trials, which are recognized as the recommended approach to measuring energy efficiency program results by the United States Department of Energy.[3] EPA's guidance on measurement and verification in the Clean Power Plan also recognizes randomized control trials as the best practice. Opower's energy savings have been verified by randomized control trials more than fifty times.[4]

7. Opower has the capability to generate significantly more savings. If we were to send energy usage information to every household in the United States (excluding households where the benefits of receiving this information are outweighed by the costs, due to exceptionally low usage or cheap electricity), we would generate 10,200,000 tons of CO_2 savings every year.

8. Petitioners contend that they need to take steps immediately in order to comply with the Clean Power Plan's goals. But the savings achievable through the use of Opower's software can be deployed quickly. From when a utility signs a contract with us to deliver energy usage information, it generally takes a matter of weeks until we are generating energy savings and pollution reductions. In 2015,

[2] https://opower.com/company/news-press/press_releases/130.
[3] https://www4.eere.energy.gov/seeaction/system/files/documents/emv_behaviorbased_eeprograms.pdf.
[4] A majority of these evaluations are available at this website: https://opower.com/company/library/verification-reports.

our average time between contract signing and achieving savings was eighteen weeks. As we improve our software tools, this time has gotten shorter. We anticipate it will continue to shrink in the future and we will be able to deliver more savings with faster launch times. The costs of deployment are included in the total program costs, which have been evaluated and found to be cost-effective more than fifty times.[5]

9. Investments in energy efficiency have a range of benefits beyond reduced pollution. In particular, energy efficiency programs save customers money. As described above, Opower has helped customers save more than $1 billion since 2007. Energy efficiency programs also increase customer satisfaction. We have found that the percentage of customers reporting overall satisfaction with their utility increases by 5 percent after receiving energy information generated by Opower, and other customer satisfaction metrics see similar impacts.[6]



Dated: December 4, 2015 RICHARD W. CAPERTON

[5] A majority of these evaluations are available at this website: https://opower.com/company/library/verification-reports.
[6] For a summary of Opower's customer satisfaction results, see: https://opower.com/results.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	)	No. 15-1363 (and consolidated cases)

Declaration of Geoff Chapin, CEO of Next Step Living

I, Geoff Chapin, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am CEO and founder of Next Step Living, a leading residential energy efficiency and renewable energy company based in the Northeast and one of the

fastest-growing companies in the country. With our cornerstone top-to-bottom home energy assessment to identify ways to save money and energy, Next Step Living and our expanding portfolio of energy-saving solutions make it easy to take immediate action towards living more sustainably, affordably and comfortably. Over the last seven years, Next Step Living has helped over 115,000 people take action for their homes, achieving over $50M in energy savings and hundreds of thousands of tons of CO2 emissions avoidance. Headquartered in Boston's Innovation District, the Next Step Living team of over 550 people across three states is at the forefront of a more sustainable future, and partners with hundreds of local communities and contractors to achieve these goals.

2. My responsibilities at Next Step Living include setting and executing overall strategic direction for the company, managing relationships with the board and investors, recruiting and overseeing our executive team, and representing Next Step Living in partnerships and policy efforts important for addressing the carbon problem and achieving our corporate mission.

3. Next Step Living is a member of Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in support of proposed-

intervenor AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan," or the "CPP").

The CPP Will Not Negatively Impact Energy Reliability

4. Many of the action options available to states to promote existing power-plant compliance with the CPP have *positive* impacts on energy reliability, and do not merely avoid negative impacts. To speak to one example specific to my company's experience, energy efficiency investments improve energy reliability by reducing both peak demand and overall demand. An illustration of the specific and "bankable" nature of demand savings created by incorporation of energy efficiency is demonstrated by the ISO-NE system planning process. ISO-NE, an independent regional transmission organization in the Northeast United States, incorporates energy efficiency into its system planning and forecasting, illustrating the high level of energy reliability provided by these savings, and also the positive impacts on system reliability provided by the incorporation of energy efficiency measures. In fact, the latest ISO-NE energy efficiency forecast estimates that, among other benefits, for the period 2019-2024: *"Growth in peak demand, the periods of highest electricity usage, will slow from 1.3% to 0.7% due*

to adoption of energy-efficient lighting, appliances, cooling, and building operation." See ISO New England, Energy-Efficiency Forecast, http://www.iso-ne.com/system-planning/system-forecasting/energy-efficiency-forecast.

The CPP Will Not Increase Energy Costs

5. In the experience of my company, energy efficiency measures make a significant and sustained contribution to *reducing* energy costs for all members of the community. To take Massachusetts as an example of how energy efficiency measures have been deployed and resulted in cost savings, consider the following:

- Massachusetts and several other states have a legislative requirement to invest in energy efficiency as long as it is the "low cost resource," lower cost than market-priced generation of electricity.
- The benefit-to-cost ratio achieved for electric energy efficiency investments have averaged over 5X (ranging 2.3x-5.9x by building sector), providing $2.27 to $5.90 in benefit for each dollar invested. *See, e.g.*, http://www.masssavedata.com/Public/CostToDeliver. This is a clear reduction in energy costs, not an increase.
- A recent Acadia Center study of the impact of energy efficiency investments shows that such investments saved the New England region $1.5 billion in

energy costs during the winter of 2014 alone, reducing demand by 14% and the price of wholesale electricity by 24%. *See* http://acadiacenter.org/document/winter-impact-electric-efficiency/.

EPA's Projected Compliance Timeframes Are Not Unreasonable

6. I understand that Petitioners contend that the CPP compliance timeline is too short to allow affected entities to take cost-effective compliance measures. In fact, the timeline to make and realize impacts from energy efficiency investments is much shorter than CPP's projected timeline, allowing ample time for preparation and action by regulated entities.

7. For one thing, many states already have energy efficiency programs that can be used to deliver savings for the CPP, reducing the amount of preparation and setup time required. *See, e.g.*, The Edison Foundation, Summary of Electric Utility Customer-Funded Energy Efficiency Savings, Expenditures, And Budgets, Figure 5 (March 2014), http://www.edisonfoundation.net/iei/Documents/InstElectricInnovation_USEESummary_2014.pdf (charting top ten states' electricity efficiency expenditures in 2012).

8. Furthermore, in my experience, the state planning cycle for setting targets and budgets for energy efficiency programs is generally 1-3 years – much shorter than the alleged decades-long timeline raised as a concern by Petitioners. Energy

efficiency markets respond quickly to such targets and investment, as demonstrated repeatedly across several states. For example, Massachusetts increased electric savings over 30% from 2012 to 2014 (*see* http://ma-eeac.org/wordpress/wp-content/uploads/4th-Quarter-2014-Program-Administrators-Presentation1.pdf), and Connecticut increased electric savings over 50% in the same timeframe. Both have fresh three-year plans for the 2016-2018 time period, with expected further growth in savings.

9. As a 2014 study by the Edison Electric Foundation showed, forty-eight states already had established and were operating energy efficiency programs by 2013, and over thirty states had investment budgets over $30M. See The Edison Foundation, Summary of Electric Utility Customer-Funded Energy Efficiency Savings, Expenditures, And Budgets, at Table 7, http://www.edisonfoundation.net/iei/Documents/InstElectricInnovation_USEESummary_2014.pdf.

10. In sum, based on my experience, energy efficiency measures are already well established and I expect such initiatives will improve energy reliability and be cost-competitive compliance options under the Clean Power Plan. I would like to add my voice in support of implementation of the Clean Power Plan and its associated benefits.

Dated: 12/7/15

Geoff Chapin,
CEO and Founder, Next Step Living

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF JOSEPH CONDO

I, **Joseph Condo**, declare as follows:

1. I am Senior Vice President and General Counsel at Invenergy LLC, responsible for oversight of all legal and government affairs issues.

2. Invenergy is an independently owned company that develops, owns, and operates power generation and energy storage facilities across North America and

Europe. Invenergy is unique in its diversified portfolio of clean energy and storage resources. More specifically:

- Invenergy is North America's largest privately held wind power generation company and has 65 wind farms under construction or in operation across the United States, Canada and Europe, totaling over 6,591 MW globally.
- Invenergy has been expanding its portfolio to include solar resources since 2012 with a 20 MW facility in Illinois, a three MW solar project in Georgia, and a 6.3 MW project in California. Currently, Invenergy has a 50 MW project under contract in Nevada and is constructing a 19.8 MW project in North Carolina. Additional projects are in various stages of development across North America.
- Invenergy has a large portfolio of natural gas-fueled electric generating facilities in the United States and Canada, including green field projects it initiated, as well as facilities that Invenergy has acquired and developed. Operating projects total 3,159 MW and include Spindle Hill Energy Center (CO), Hardee Power Station (FL), Cannon Falls Energy Center (MN), Grays Harbor Energy Center (WA), St. Clair Energy Center (Ontario) Nelson Energy Center (IL), and Ector County Energy Center (TX).
- Invenergy is a pioneer in advanced energy storage systems and is one of the largest and most experienced developers, owners and operators of battery storage assets worldwide. With more than 68 MW of energy storage projects in

operation and an additional 175 MW in development, Invenergy is leading the transformation of the rapidly evolving energy storage industry.

3. Invenergy is a member the American Wind Energy Association ("AWEA") and Advanced Energy Economy ("AEE"), both of which have moved to intervene in support of the Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in support of the brief filed by AWEA and AEE in opposition to Petitioners' motions to stay the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan" or "CPP"). In particular, the purpose of my declaration is to provide information to the Court relating to the question whether Petitioners will suffer irreparable harm absent a stay of the Clean Power Plan.

Utilities Will Not Need to Incur Project Development Costs in the Near Future to Comply with the Clean Power Plan and Will Not Suffer Immediate Harm as a Result

4. In seeking a stay, Petitioners claim that their affected industries will be immediately harmed by the Clean Power Plan. In particular, they contend that utilities will need to incur immediate costs to begin developing low-carbon generation to comply with the Clean Power Plan. That claim is incorrect, for several reasons.

5. To begin with, renewable energy developers currently have a very large portfolio of proposed wind and solar projects that can be built quickly, as time-intensive steps such as resource assessment, permitting, and interconnection studies

have already been completed. Invenergy currently has an extensive number of projects in the development pipeline that can be deployed to help support CPP targets throughout the United States in a timely manner.

6. Petitioners contend that the lead time for new generation projects can be a decade or more—and that they therefore need to start complying now, in the absence of a stay. But the full development cycle for a wind or solar project is sufficiently short so that even projects for which no development steps have begun until after commencement of litigation could be brought online before the start of Clean Power Plan compliance requirements. As a result, there will be no shortage of clean-energy projects available for utilities to use for Clean Power Plan compliance if they choose to do so in the future. Invenergy can successfully execute on and bring to operation a utility scale wind project within three years from the initial start of development through to start of commercial operation. In regions like Texas where the states actively support wind development by playing a smaller role in the permitting and regulatory process resources can be brought online even more quickly, in two years or less and the result of this policy can be seen in the influx of wind that commenced operation in Texas in recent years. In states like South Dakota, where the Public Utility Commission has a six month deadline to rule on permitting, projects can also be brought online rapidly to respond to the CPP.

7. The lead time to bring a natural gas-fueled electric generating facility into commercial operation is also more abbreviated than Petitioners claim. A simple cycle

unit can be constructed in two years with a year for permitting, interconnection studies and other development issues and a year for the construction of the facility. A combined cycle unit can be constructed in four to seven years, depending on the size of the unit, with two to four years for permitting, interconnection studies and other development issues and a two to three years for construction. The bottom line is that the lead time necessary for the construction of new generation projects is not the interminable process that Petitioners, who are not developers, imagine it to be.

8. Nor will utilities need to expend significant upfront costs to comply with the Clean Power Plan. Nearly all wind and solar projects are developed by private developers, such as Invenergy, so no cost or risk is incurred by the utility until a Power Purchase Agreement ("PPA") to buy the output of the wind project or a contract to purchase the wind project is signed. The signing of a PPA for a wind or solar project typically occurs one or two years prior to the project's in-service date, and sometimes even after a project has become operational. Based on my experience, Invenergy will sign a PPA with an offtaker 12-18 months in advance of a project's in service date though that timeline could be reduced given the demand for renewable energy projects in response to the CPP and Clean Energy Incentive Program ("CEIP").

9. Because either signing a PPA or purchasing a late-stage wind or solar project from a developer is always an option for a utility, there is little to zero cost or risk over the next several years for developing such projects for Clean Power Plan

compliance. Real-world experience demonstrates that utilities can add a large amount of wind and solar generation to their portfolios in a short period of time and without incurring any cost prior to signing a purchase contract (either a PPA or direct project ownership), which indicates that a stay is not necessary for utilities to avoid near-term development costs for generation to comply with the Clean Power Plan. Moreover, for approximately half of the fifteen percent of wind capacity that is directly owned by utilities, the projects were initially developed by a private wind developer and sold to the utility at a later date.

10. Therefore, for the vast majority of wind and solar projects, the utility incurs no cost or risk for developing a wind project until very late in the development process, ensuring that utilities need not incur any costs for procuring generation to comply with the Clean Power Plan until many years from now, at the earliest. This is true regardless of whether a utility pursues direct project ownership or a PPA.

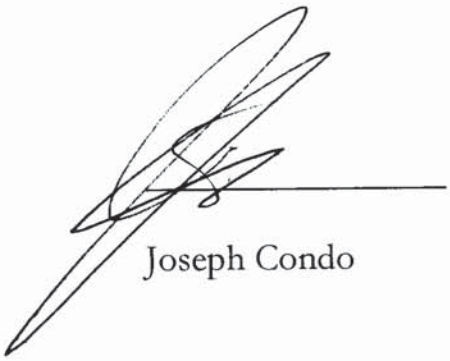
11. As a result, a utility can currently wait at least several more years to sign a contract for wind or solar generation and still have that generation online by the 2022 start of the Clean Power Plan compliance time period. In short, the claims made by the Petitioners' declarants about the lengthy amount of time it takes to procure new low-carbon generation, such as wind and solar energy, are unfounded.

12. Already Invenergy has begun to increase its clean and renewable generation development efforts in response to the finalization of the CPP in August 2015 and in response to the EPA's inclusion of the CEIP. Both the rule and the

addition of the CEIP, which is intended to ramp up renewable energy and energy efficiency development prior to the 2022 compliance date, have provided the electricity sector with more certainty from a planning and investment perspective. This certainty gives financiers and developers more confidence that their investments will result in successful projects and gives utilities more certainty that they will be permitted to recover the cost of a build transfer or PPA for clean and renewable energy resources going forward.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: December 8, 2015



Joseph Condo

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF RICHARD H. COUNIHAN
ON BEHALF OF NEST LABS, INC.

I, Richard H. Counihan, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am Head of Energy Regulatory and Governmental Affairs for Nest Labs, Inc.
2. Nest Labs is a wholly-owned subsidiary of Alphabet, Inc., and is based in Palo Alto, California.
3. Nest Labs was founded in 2010 and aims to reinvent home products like the thermostat and smoke alarm to provide customers with hardware, software and services to help them reduce energy consumption and remain comfortable and

safe at home. Nest Labs also offers additional energy efficiency and demand response services to help utilities address load management needs. Nest Labs products are currently sold in the United States, United Kingdom, Canada, France, Belgium, the Netherlands, and Ireland, and have been installed in more than 120 countries.Nest Labs is a member of Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in connection with proposed-intervenor AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan").

4. Energy efficiency products and services are currently offered by a number of companies, including Nest Labs. Such energy efficiency offerings can deliver measurable energy savings to users.

5. Nest manufactures the Nest Learning Thermostat, a Wi-Fi-enabled thermostat which is equipped with sensors (e.g., temperature, humidity, occupancy and ambient light sensors), as well as processors that run software incorporating predictive algorithms to enable the device to predict customer preferences based

on their occupancy and temperature adjustment habits. Other companies manufacture Wi-Fi enabled thermostats as well.

6. The Nest Learning Thermostat and other Wi-Fi enabled "smart" thermostats can, for example, turn the temperature down when a house is empty and automatically lower air conditioning runtime when humidity conditions permit. These steps can help people lower their energy usage while remaining comfortable at home.

7. Several recent studies have concluded that smart thermostats offer significant energy savings. For example:

    a. The Pennsylvania Statewide Evaluator ("SWE") included smart thermostats in its Energy Efficiency Potential Study, which the Pennsylvania Public Utilities Commission is using to inform its decisions on what level to set energy efficiency goals for electric utilities in Pennsylvania. The SWE found that smart thermostats saved about 11% on electric heating and cooling.[1]

    b. The Energy Trust of Oregon recently released a study of Nest Labs thermostats used with electric heat pump heating. The Energy Trust,

[1] Energy Efficiency Potential Study for Pennsylvania; Pennsylvania Public Utility Commission; prepared by the Statewide Evaluator Team, February 2015; Appendix D; Original Measure #2077; p. D-7.

which runs the energy efficiency programs for the electric utilities in Oregon, found that the thermostats saved 12% on electric heat pump electricity use.[2]

c. Vectren, an electricity and natural gas utility in southern Indiana, recently released a study finding that Nest Labs thermostats saved 14% on air-conditioning electric usage.[3] The Vectren study also showed significant savings on heating (approximating 10%) in homes heated by natural gas.

d. The Northern Indiana Public Service Company ("NIPSCO"), an electric and gas utility in northern Indiana released a study finding that Nest Labs thermostats saved an average of 16% on air-conditioning electric usage.[4]

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[2] Energy Trust of Oregon, Nest Thermostat Heat Pump Control Pilot Evaluation, by Apex Analytics, Oct. 10, 2014, p.1-1, *available at* http://energytrust.org/library/reports/Nest_Pilot_Study_Evaluation_wSR.pdf.

[3] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Vectren Corporation; prepared by Cadmus Group, Jan. 29, 2015, p. 3, *available at* http://www.cadmusgroup.com/papers-reports/evaluation-2013-2014-programmable-smart-thermostat-program/.

[4] Evaluation of the 2013-2014 Programmable and Smart Thermostat Program; prepared for Northern Indiana Public Service Company; prepared by Cadmus Group, Jan. 22, 2015, p. 3, *available at* https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.aspx?DocID=0900b631801c5039.

e. Nest Labs performed a study of Nest Labs thermostat users around the United States and found an average of 17% savings on air-conditioning electric usage.[5]

8. There are approximately 134 hundred million homes in the United States. [6] While not every home has a thermostat, most do and many have more than one thermostat so the addressable market may be as much as 150 million thermostats. The Nest Learning Thermostat is currently priced at $249 on the Nest Labs' website.[7]

9. Widespread adoption of smart thermostats could offer significant energy savings. For example, the Energy Information Administration indicates that, as of 2009, American households used 120 million MWhs of electricity for heating and 186 million MWhs for cooling (*i.e.*, a total of 306 million MWhs).[8] If we could save 5 to 10 percent of that energy consumption through the use of Wi-Fi enabled smart thermostats (figures lower than the results of the analyses described

[5] Energy Savings from the Nest Learning Thermostat: Energy Bill Analysis Results, Nest Labs, Feb. 2015, p. 6, *available at* https://nest.com/press/#documents.

[6] United States Census; Quick Facts, *available at* http://quickfacts.census.gov/qfd/states/00000.html.

[7] *See* https://store.nest.com/product/thermostat/.

[8] U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey, Table CE4.1 Household Site End-Use Consumption by Fuel in the U.S., Totals, 2009, *available at* http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption#end-use-by-fuel.

in para. 8 above), the total savings would be approximately 15 to 30 million MWhs per year, amounts roughly equal to the annual output of between three and seven 500 MW power plants operating at 95% capacity factors.

10. Utility and state-run programs can accelerate the adoption of smart thermostats, using traditional delivery methods such as education, rebates, and in some cases giving away the thermostats to their ratepayers. Nest Labs is currently working with more than a dozen utilities and state agencies to distribute smart thermostats to utility customers.

11. In addition, thermostats with a connection to the Internet can be used by utilities themselves to help reduce load during periods of potential failure, smooth out the load shape, and even increase the use of energy when low-carbon generation is on the margin.

12. For example, Nest Labs offers its utility partners a demand response program called Rush Hour Rewards ("RHR"). Utilities can use RHR to reduce air-conditioning loads during hot afternoons when the reliability of the grid might be threatened or the cost or carbon content of generation is high.

13. Utilities participating in RHR send Nest Labs a signal two hours or more in advance of the time when they want the load reduction to occur. Nest Labs then sends a signal to Nest Labs users who have voluntarily agreed to participate in RHR, alerting them to the upcoming event. The Nest Labs

thermostat then creates a customized response for each participating home whereby it can "pre-cool" the home prior to the event start, and then during the event allow the temperature in the house to drift upward. This can reduce the amount of air-conditioning run time, thereby reducing the load on the electrical grid.

14. A study done by CPS Energy, a municipal utility located in San Antonio, Texas, found that on average, homes enrolled in RHR reduced their peak load by 0.93 KW per house while reducing overall energy use.[9]

15. This level of load savings when multiplied over large numbers of customers can make a significant contribution to grid reliability. If 100,000 customers were enrolled in RHR, and achieved the load reductions cited in the CPS study, that would be 93 MW of load drop—an amount equal to the output of a medium-sized peaker plant.

16. This type of technology also could be adapted as renewable energy is increasingly integrated into the grid. For example, in a utility system where solar energy made up a larger portion of generation than it presently does, demands on the grid might be lessened by pre-cooling houses during the daytime, when solar

[9] CPS Energy Nest Pilot Evaluation FY2015 – FINAL; Nexant Consulting (Nov. 21, 2014), p. 2.

energy was being generated, in order to reduce the need for fossil generation after sunset.

17. Nest Labs' analysis indicates that customers with both gas heating and electric air-conditioning can save, on average across the country, approximately $131 to $145 annual on their utility bills by using a Nest Labs thermostat.[10]

18. The savings estimates described above will vary across regions, energy prices, and residences. And they are not a guarantee of individual energy savings. However, for example, saving only $100 per household per year would defray the purchase price of the thermostat itself in less than three years, while producing ongoing energy and financial savings for consumers and efficiency gains for the electrical system.

19. Smart thermostats are not the only residential electronic goods offering energy efficiency benefits. Other technologies, such as efficient lighting and "smart strips" for plug loads, are widely available and can offer significant energy savings as compared to traditional technologies. These new technologies, like those deployed in the Nest Learning Thermostat, can also help integrate diverse generation sources and maintain grid reliability.

[10] Energy Savings from the Nest Learning Thermostat: Energy Bill Analysis Results, Nest Labs (Feb. 2015), p. 6, *available at* https://nest.com/press/#documents.

Richard H. Counihan

Richard H. Counihan

Dated: December 8, 2015

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IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF GARY DEMASI, DIRECTOR, OPERATIONS - DATA CENTER ENERGY & LOCATION STRATEGY, GOOGLE INC.

I, Gary Demasi, do hereby declare under penalty of perjury that the following statements are true and correct to the best of my knowledge, information, and belief:

1. I am Director, Operations - Data Center Energy & Location Strategy, at Google Inc. ("Google"). As Director, Operations - Data Center Energy & Location Strategy of Google, I am responsible for Google's overall data center site selection strategy and the management of the company's global electricity supply portfolio for data centers. I submit this declaration in connection with proposed-intervenor

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Advanced Energy Economy's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan").

2. Google, a subsidiary of Alphabet, Inc., is one of the world's leading technology companies. Google has more than 50,000 employees in 70 offices throughout every region of the United States, as well as in 40 countries. As a primary component of our business, Google owns and operates data centers in six U.S. states (Georgia, Iowa, North Carolina, Oklahoma, Oregon, and South Carolina), as well as additional data centers around the world. In June 2015, Google announced plans to build a seventh U.S. data center in Alabama.

3. Google is a significant consumer of electricity, using approximately 4.4 terawatt-hours of electricity in 2014, the majority of which is consumed by our data center operations. As Google plans its data center energy resourcing needs, we continually look for ways to reduce the energy consumption at these facilities. As a result of this focus, our data centers are some of the most energy efficient in the world. The emissions associated with our remaining electricity demand represent the majority of the company's carbon footprint. To address this, Google has made a commitment to match our electricity consumption with 100 percent

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renewable energy. We are pursuing this commitment because we believe it makes good business sense, as we discuss below.

4. As of December 2015, Google has signed contracts for the output of 2,020 megawatts of renewable energy. In 2014, Google had signed contracts for renewable energy to cover the equivalent of 37% of our operations. We expect that our purchases of renewable electricity will increase significantly over the next few years as we continue to pursue our goal of offsetting 100% of our operations with renewable power.

5. I am familiar with the Clean Power Plan. On December 6, 2014, Google filed comments on the proposed Clean Power Plan.[1] These comments urged the EPA to further recognize the contribution that renewable energy could make as a cost-effective compliance option.

6. As a large electricity consumer, Google closely monitors the availability and price of retail and wholesale electricity in a diversity of markets, including for renewable energy. In recent years, Google has observed significant incremental growth in the total installed capacity of renewable energy, concurrently with consistent declines in the price of renewable power. For example, analysis of the levelized power purchase agreement ("PPA") price of wind energy in the

[1] http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-22929.

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Southwest Power Pool—where Google purchases significant volumes of wind energy—shows consistent declines from 2010-2015.[2] Average levelized wind PPA prices in 2014 in 'interior' states[3] with strong renewable resources, including states where Google has data center operations, were comparable or lower than the average annual wholesale power prices in those states[4]—showing that wind energy has achieved parity with traditional grid power in some regions of the United States. The average price of solar power has also decreased dramatically since 2010, and analysts expect prices to continue to decrease in coming years.[5]

7. Based on our market experience, we expect continued expansion of installed renewable energy capacity, and continued decline of long-term renewable energy prices relative to traditional grid power prices, over the next several years, consistent with historical market trends.

8. We believe the Clean Power Plan, when fully implemented, would not cause business harm to Google, as a large energy consumer. In fact, we expect the

[2] Lawrence Berkeley National Laboratory. "2014 Wind Technologies Market Report". August, 2014. Page 56. https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.
[3] Analysis includes prices from Texas, Arizona, Oklahoma, Nebraska, Kansas, Missouri, Colorado, Iowa, Minnesota, North Dakota, South Dakota, Wyoming, Montana.
[4] Lawrence Berkeley National Laboratory. "2014 Wind Technologies Market Report," at 59 (Aug. 2014), *available at* https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.
[5] U.S. Department of Energy. "Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections," (Sept. 2014), *available at* http://www.nrel.gov/docs/fy14osti/62558.pdf.

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Clean Power Plan, when compliance begins in 2022, will be beneficial to Google by facilitating our continuing ability to procure renewable energy readily.

9. Google's data centers operate twenty-four hours a day, seven days a week, three-hundred-sixty-five days a year, and depend on an extremely reliable electricity supply. Google has successfully obtained its electricity supplies to assure reliable service, and some of the grids in which Google operates heavily rely upon the use of renewable energy. For example, in states such as Iowa and Oklahoma—both states where Google has large data centers—upwards of 15 percent of electricity on the grid are supplied by wind. I am aware of no problems with the stability of Google's data center electric supply due to the intermittency of renewable power in these states or others. Google's experience is that this level of renewable integration can be managed by grid operators.

10. Because renewable energy technologies like wind and solar generally have low and stable marginal costs and are not subject to fuel price volatility, procurement of renewable electricity through long-term PPAs allows Google to secure contracts that minimize Google's exposure to future electricity price inflation. Our experience is that renewable energy PPAs can be financially beneficial to Google due to the reduced exposure to increasing wholesale power

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prices in the future. Google's PPAs are typically 10-20 years in duration, allowing us to secure a fixed price for renewable energy for an extended timeframe.

11. To the extent that a stay of the Clean Power Plan results in any uncertainty or slowing growth of the renewable energy market, a stay will harm Google by hindering the company's plans to purchase more renewable energy as discussed above, or by forcing Google to obtain the benefits of using more renewable energy at a higher cost.

Executed this 7th day of December, 2015.

DocuSigned by:
Gary Demasi
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Gary Demasi

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF SEAN GALLAGHER

I, Sean Gallagher, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Response by Proposed Respondent-Intervenor Solar Energy Industries Association ("SEIA") in Opposition to Petitioners' Motions for Stay.

2. I am Vice President for State Affairs for SEIA. I have served in that position since December, 2014. I oversee SEIA's legislative, regulatory, and policy development work in states nationwide.

3. Based on my experience, and contrary to the assertions of many of the declarations submitted in support of Petitioners' motions for stay, states can meet the

requirements of the Clean Power Plan without adverse impact on reliability or costs of electric power generation.

4. The United States has some of the richest solar resources in the world. The U.S. solar industry grew by 35% from 2013 to 2014 and by a compound annual growth rate of 52% since 2006. In 2014, the solar industry installed over 6,200 MW of solar photovoltaic (PV) capacity and 767 MW of concentrating solar power (CSP) capacity, accounting for 32% of all new electric generating capacity added to the U.S. grid in 2014.[1] The solar industry in the United States was valued at $17.8 billion in 2014.[2]

5. As the industry has grown, installation and other costs have correspondingly dropped. According to SEIA and GTM Research, the average cost to install a residential solar PV system has dropped by 48% since 2010, reaching $3.50/watt at in Q2 2015. The price to install a utility-scale system has dropped by 62% since 2010, to $1.38/watt by Q2 2015.[3]

6. According to Lazard, a financial advisory and asset management firm, the unsubsidized Levelized Cost of Energy (LCOE) of residential solar PV is $184 to $300/MWh; commercial solar PV from $109 to $193/MWh, utility-scale PV from $50 to $70/MWh, and solar thermal with storage from $119 to $181/MWh. The same analysis finds the LCOE of coal plants to be $65 to $150/MWh and natural gas

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[1] SEIA/GTM U.S. Solar Market Insight™ Year in Review 2014 Report. All U.S. Solar Market Insight Reports are available here: http://www.seia.org/research-resources/us-solar-market-insight

[2] Solar Energy Facts: 2014 in Review. http://www.seia.org/sites/default/files/Q4%202014%20SMI%20Fact%20Sheet.pdf.

[3] SEIA/GTM Research *U.S. Solar Market Insight* Q2 2015.

combined cycle plants range from $52 to $78/MWh. Gas peaking plants have a significantly higher LCOE of $165/MWh - $218/MWh.[4]

7. The U.S. Energy Information Administration (EIA) provides similar estimates. According to the EIA, the average unsubsidized LCOE of solar PV is $125/MWh, compared with $115/MWh for advanced coal technologies and $75/MWh for conventional combined cycle natural gas technologies.[5]

8. The steady decline in solar energy costs makes it a cost-effective solution to reducing greenhouse gas emissions, modernizing grid operations, and increasing energy independence, while simultaneously lowering long-term electricity supply costs and providing significant economic benefits. Solar contributes to a balanced portfolio of energy resources, and can help achieve an optimal long-term strategy for the economy and the environment.

9. Renewable energy makes up an increasingly large share of new electric capacity. Since 2006, at least 21% of electric capacity added every year has been from renewable sources.[6] From 2012-2014, renewables made up 50% of all electric capacity added to the grid, and reached 55% of new installed capacity in 2014.[7] Through the first 6 months of 2015, solar made up 40% of all new electricity capacity added to the

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[4] Lazard, Levelized Cost of Energy Analysis Version 9.0, September 2015, https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf.

[5] U.S. Energy Information Administration, Levelized Cost and Levelized Cost of New Generation Resources in the Annual Energy Outlook 2015, http://www.eia.gov/forecasts/aeo/electricity_generation.cfm.

[6] SEIA/GTM Research U.S. Solar Market Insight Report Q2 2015.

[7] EIA 860 and EIA Electric Power Monthly.

grid, with renewables making up 75% of all new electric capacity added in the first half of 2015.[8]

10. The EPA's Clean Power Plan recognizes and bolsters the current opportunity to reduce carbon emissions by transitioning the United States electric grid from fossil fuel dominance to a balanced energy portfolio with a higher percentage of renewable energy resources.

11. The Clean Power Plan will require affected electric generating units (EGUs) to reduce their carbon emissions, thus presenting the opportunity for utilities and states to shift towards sources that generate energy with little or no carbon emissions such as solar energy. The EPA has recognized the importance of renewable energy and the role for renewable energy to play in this transition, and has included renewable energy as a part of the best system of emission reduction (BSER) that has been adequately demonstrated to reduce emissions from affected EGUs.

12. Solar energy is generated through a variety of technologies. *Photovoltaic* (PV) panels generate electricity directly from sunlight via an electrochemical process that occurs naturally in semiconductors. Utility-scale PV projects have come on line at a rapid pace in the past five years, and are cost-effective in markets from Massachusetts to Minnesota to Texas to California. *Concentrating solar power* (CSP) uses reflective materials like mirrors and lenses to concentrate sunlight to generate thermal energy, which is in turn used to generate electricity. CSP projects with thermal energy storage can store energy for six to twelve hours or more, and are as dispatchable as

[8] SEIA/GTM Research *U.S. Solar Market Insight* Q2 2015, EIA Form 860 and EIA Electric Power Monthly.

electricity generated from conventional sources. *Distributed generation* (DG) refers to electricity that is produced at or near the point where it is used. DG solar projects can be located on rooftops or ground-mounted.

13. Solar and other types of renewable energy are already being integrated reliably into the grid today and have been proven to perform well at high penetration levels. This increase is being driven by, among other things, falling costs and recognition by states of the need to decarbonize their energy portfolios and reduce the risks, both cost and grid-related, associated with over-reliance on limited energy sources. For example, California served 18.77% of total load in 2013 with renewable resources, not including distributed generation (DG) solar resources,[9] and approximately 25% of total load with renewables in 2014.[10] On an instantaneous basis, California regularly serves above 25% of load with renewable resources. California is on track to use renewable sources to generate 33% of load with no serious reliability or grid integration issues.

14. The experience of California and other states shows that high levels of solar can be integrated into the grid without affecting reliability or grid stability. In California, as of 2013, the three largest investor-owned utilities collectively served 22.7% of their 2013 retail electricity sales with renewable power and approximately 25% of total load with renewables in 2014.[11] Due to this success, California recently

[9] http://energyalmanac.ca.gov/electricity/total_system_power.html

[10] http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf

[11] http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf; http://www.cpuc.ca.gov/PUC/energy/Renewables.

implemented a law that mandating that at least 50% of its power be generated from renewables by 2030, with much of the power coming from distributed and utility-scale solar.[12] Similarly, the Governor of New York has announced plans to direct the Public Service Commission to promulgate rules mandating that 50% of New York's power supply come from renewable energy by 2023.[13] Hawaii, which is already among the highest generators of solar in the country measured as a percentage of total electricity generation, recently enacted legislation mandating 100% renewable use by 2045.[14] Vermont has also increased its renewable energy mandate to 75% by 2032.[15] Additionally, Minnesota and Illinois are currently considering increasing their renewable energy procurement under their RPS laws.[16]

15. In fact, solar energy and renewables can improve grid reliability and provide benefits to the existing energy infrastructure, including reducing transmission

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[12] http://www.latimes.com/politics/la-pol-sac-jerry-brown-climate-change-renewable-energy-20151007-story.html.

[13] http://www.nytimes.com/2015/11/23/nyregion/gov-cuomo-to-order-large-increase-in-renewable-energy-in-new-york-by-2030.html?_r=0; New York State Energy Planning Board, The Energy to Lead; 2015 New York State Energy Plan, www.energyplan.ny.gov; http://ny-sun.ny.gov/.

[14] "Hawaii Passes Legislation to Go 100% Renewable," Greentech Media (May 12, 2015), http://www.greentechmedia.com/articles/read/hawaii-passes-legislation-to-go-100-renewable.

[15] http://www.vpirg.org/resources/vermont-just-passed-a-renewable-energy-standard-heres-what-it-does/

[16] "Illinois Lawmakers Introduce Far-Reaching Clean Energy Bill With Bipartisan Support," Think Progress (Feb. 20, 2015), http://thinkprogress.org/climate/2015/02/20/3625138/illinois-clean-energy-bill/; "Minnesota lawmakers consider bills on RPS, efficiency, CPP compliance," Utility Dive (Mar. 19, 2015), http://www.utilitydive.com/news/minnesota-lawmakers-consider-bills-on-rps-efficiency-cpp- compliance/376899/.

losses and relieving congestion on the grid.[17] Solar energy can be configured and operated to provide various reliability services and transmission benefits that streamline electric power system operations. Solar PV can include advanced features that enable it to operate more like conventional power plants and actively contribute to the stability and reliability of a regional grid.[18] These advanced features can enable solar PV to provide a state or region with additional system flexibility by responding to utility and independent system operator (ISO) instructions.

16. Concentrating solar power plants possess valuable system reliability attributes. With the integration of thermal energy storage, CSP facilities can be fully dispatched by utilities and system operators, meaning that the plants are capable of ramping power output up and down to meet changing energy demand, without material efficiency losses. In addition, CSP plants with storage are a significant source of essential grid flexibility services, such as ramping, regulation and spinning reserves, which are critical to a reliable system.

17. On an aggregated basis, utility-scale and distributed solar resources can provide significant reliability and transmission benefits to a state or regional grid, even if solar output varies at individual locations due to localized cloud coverage. When the sum of the solar installations in a geographic area is assessed, the variability is

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[17] *See* NREL Renewable Electricity Futures Study, http://www.nrel.gov/analysis/re_futures/; "Integrating High Penetration Renewables: Best Practices from International Experience," http://www.jisea.org/high_pen.cfm.

[18] Some of these features may include voltage regulation, active power controls, ramp-rate power controls, fault ride-through, and frequency response controls. *See* Morjaria & Anichkov, "Grid Friendly" Utility-Scale PV Plants, First Solar (Aug. 13, 2013).

reduced and can be managed by the grid operator. In a recent study regarding the integration of wind and solar in the PJM (Pennsylvania-Jersey-Maryland) ISO, General Electric International, Inc. (GE) found that PJM's large geographic footprint significantly reduced the magnitude of variability-related challenges as compared to smaller balancing areas.[19] GE noted that an individual solar plant's variability is significantly reduced when solar plants are aggregated and located in a geographically diverse manner throughout PJM.[20]

18. Further, targeted deployment of solar in congested areas provides relief to transmission systems, defers costly transmission upgrades, and helps maintain grid reliability. For example, unlike central station power plants, solar installed on-site does not experience transmission and distribution system losses, which can be as high as 7 percent on a utility distribution system and up to 20 percent at the time of system peak.[21] Similarly, utilities may site small utility-scale power plants in specific locations to ease congestion on a particular transmission line.

19. Finally, solar technologies do not require pipelines, coal transport or the associated production and processing infrastructure needed by coal and gas industries. This has the potential to save immense costs as the energy infrastructure in the U.S.

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[19] General Electric International, Inc., PJM Renewable Integration Study at 12 (Feb. 28, 2014). *See also*, the National Renewable Energy Laboratory (NREL) report on its extensive modeling of grid operations with significant wind and solar generation, which found that in such scenarios the grid will operate reliably. "Relevant Studies for NERC's Analysis of EPA's Clean Power Plan 111(d) Compliance," http://www.nrel.gov/docs/fy15osti/63979.pdf

[20] *Id.* at 12, 15.

[21] Regulatory Assistance Project, Regulatory Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements (Aug. 2011), www.raponline.org/document/download/id/4537.

ages and more repairs become necessary. For similar reasons and because renewables do not depend on unpredictable fossil fuel prices, the cost of electricity from renewables is subject to less price volatility than electricity from fossil fuel-fired EGUs.[22]

20. By repurposing existing transmission resources, expansion of grid infrastructure, including transmission lines, can be minimized. Transmission formerly used to deliver coal-fired power to distant loads is already being used to deliver renewable energy without new infrastructure. The Moapa project, under construction by SEIA member First Solar, will use transmission built to deliver coal-fired power from the Navajo Power Station to Los Angeles. NV Energy's retirement of the Reid-Gardner Generating Station, a coal-fired EGU, will free up additional transmission capacity. The Milford wind projects in Utah already utilize transmission that was built to deliver coal power to Los Angeles.

21. Solar energy is both scalable and modular, allowing for short construction timelines in most cases. Solar systems can range from a 2-kilowatt (kW) residential system to a 500-plus-MW utility-scale system. The development and construction timeline for a large, centralized conventional fossil fuel EGU is typically a multi-year process. By comparison, the time from conception to operation for renewable energy projects is generally much faster. Medium and small solar facilities can be built especially quickly. In places with streamlined permitting and

[22] Utility-Scale Solar 2014: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States (Lawrence Berkeley National Laboratory September 2015) (https://emp.lbl.gov/sites/all/files/lbnl-1000917.pdf)

interconnection procedures, it is possible for a three-person crew to install up to three residential PV systems in one day. A six-person crew can install a large commercial distributed generation project, such as a 100 kW flat-roof PV system, in one day. A 10-kW residential system can go from conception to completion in less than one month. Even multi-megawatt commercial systems can be constructed in less than six months. Utility systems less than 20 MW can use streamlined small generator interconnection procedures (SGIP) to bring projects to fruition quickly.

22. Energy storage will increase the flexibility of the entire system, benefitting the entire grid, including conventional generation. When combined with thermal storage, CSP generation provides additional reliability. The 280-MW Solana project, for example, operated in Arizona by SEIA member company Abengoa, is dispatchable and has the ability to store electricity for six hours by storing heat produced during the day in molten salt. Additionally, new technologies, including both fast-response and flow batteries, are increasingly being deployed and are rapidly decreasing in price. For example, an electric car manufacturer has invested billions of dollars in a state of the art lithium-ion battery factory in Nevada that is expected to drive down costs of batteries significantly and help scale batteries to be used for both residential/small commercial and utility applications.[23]

23. CSP can provide large quantities of flexible, dispatchable renewable energy to meet the grid's need for firming or shaping services without increasing emissions, thus complementing variable energy resources. CSP's ability to store and

[23] http://www.utilitydive.com/news/updated-tesla-gigafactory-will-cut-battery-costs-50-analyst-says/405970/

produce energy at any time supports grid reliability by: (1) reducing the magnitude of upward and downward generation, or ramps, throughout the day; (2) providing quick upward and downward ramping capabilities and wide operating ranges that can be sustained for the full duration of the ramping period; (3) providing predictable net output, thereby reducing forecast errors and intra-hourly variability of the aggregate variable energy resource portfolio; and (4) providing vital grid services such as voltage support, frequency response, and spinning and non-spinning reserves. Further, CSP with thermal storage avoids emissions associated with increased starts and stops and the ramping associated with fossil-fired resources, or maintaining gas-fired generation at minimum operating levels.

24. Solar energy is already cheaper than electricity from fossil fuel-fired EGUs in some cases. Costs will decrease even further as states add more solar capacity to their grids, economies of scale expand, and technologies such as thermal storage advance. The experience of states using relatively high amounts of solar, and those states' stated desire to add more renewables and especially solar, indicates that solar and renewable energy can achieve high penetration rates without affecting grid reliability. In fact, as shown above, solar already provides reliability benefits. Existing transmission and retirements of coal-fired EGUs that are no longer economical will

provide additional transmission capacity. Solar energy can and will be used by states to comply with the Clean Power Plan.

Executed at Oakland, CA, on December 4, 2015.



Sean Gallagher

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases
(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF STEVE GAW

I, **Steve Gaw**, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors and am supplying this declaration at the request of movant-intervenors the American Wind Energy Association ("AWEA").

2. I currently consult with the Wind Coalition, 610 Brazos Street, Suite 210, Austin, Texas 78701, focusing on policy issues regarding electricity within the

Southwest Power Pool ("SPP") region. I have served in that capacity since 2007.

3. I was elected to the Missouri House of Representatives in 1992 and was Speaker from 1996 to 2000. I was on the Missouri Public Service Commission from 2001 through the fall of 2007, serving as Chairman from 2003 to 2005. I was one of the founding directors of the Organization of MISO States ("OMS") and the SPP Regional State Committee. I served in every officer position with the OMS, including the office of President. I have also been a speaker and moderator in regional, national, and international forums on energy policy dealing with both electricity and natural gas.

4. The purpose of my declaration is to provide information to the Court relating to the question of whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

5. Portions of my declaration are based on my direct experience as a former state official responsible for implementing state and federal statutes and regulations and deciding state matters related to electric utilities and power plants. Among many other things, my state service included responsibility for reviewing and approving proposals to site utility infrastructure projects and contracts for power supply.

6. I am familiar with EPA's Clean Power Plan, the subject of this litigation. Based on my former role as the Chairman of the Missouri Public Service Commission and Speaker of the Missouri House of Representatives, I have the personal knowledge and experience to understand what steps the State of Missouri will need to undertake to implement the Clean Power Plan, including preparation of a state plan. My work has intimately involved me in the implementation of utility and environmental statutes and regulations by state governments, as well as reliability, transmission planning and cost allocation, and regional transmission issues related to the electric industry.

Missouri Will Have to Devote Limited Time and Resources to Produce a State Plan

7. In my experience, many of the assertions made by the movants overestimate and misstate the duties that will be imposed on state agencies by the Clean Power Plan, including Missouri's.

8. In my experience on the Missouri Public Service Commission, OMS, and the SPP Regional State Committee, Missouri's energy regulators, as well as other states' regulators, have consistently been able to effectively and efficiently discharge the duties placed on them as part of the cooperative relationship embodied in federal statutes, such as the Clean Air Act.

9. Based on my experience and my review of the Clean Power Plan, the preparation and planning that the Missouri Public Service Commission will be

required to conduct under the Clean Power Plan during the pendency of this litigation will not significantly exceed the planning duties that are often conducted by the agency in accordance with other federal rules.

10. Under the Clean Power Plan, Missouri is afforded sufficient time to develop a state plan. Missouri is not required to submit a state plan or conduct any interstate coordination before September 2016. States requesting an extension will have until September 2018 to submit final plans either alone or in cooperation with other states. In short, EPA has provided a time period of almost three years for states to prepare plans that implement the Clean Power Plan.

11. From my experience, this should be sufficient. The involvement of the Missouri Public Service Commission in the implementation of the rule is primarily related to impacts on resource planning of state regulated electric utilities and potentially on the prudency of regulated utility responses to the Clean Power Plan in future rate cases. It is anticipated that the Missouri Public Service Commission will provide information to the primary state regulatory body developing a state implementation plan. While this work is not necessarily required, it may be helpful to the state air regulatory authority (the Department of Natural Resources, Division of Environmental Quality) in drafting a state plan. In light of this limited role and the Missouri Public Service Commission's knowledge and experience in this area, the agency will

have ample time to fulfill its role in helping Missouri comply with the Clean Power Plan. Compliance with federal rules is an integral responsibility of the Department of Natural Resources and the Missouri Public Service Commission, as well as other state agencies. To the extent any costs associated with creating a state plan will occur over the next year or so, the costs and staff required by these compliance duties are factored into the agencies' annual budget and staffing plans. Creating a state plan under the Clean Power Plan falls within these compliance duties. Although movants depict the rulemaking process as complex, Missouri can prepare its Clean Power Plan implementation plan using the same process that has proven successful for other programs.

12. The final rule provides ample flexibility and a wide range of compliance paths to fit states' varying generation mixes and regulatory structures. Emissions trading, often cited by economists as the most cost-efficient emissions reduction measure, are favored by the plan and are part of the proposed federal implementation plan that Missouri, as well as other states, can choose to adopt instead of developing and submitting its own plan.

13. Missouri could also adopt an emission trading program in a state plan of its own in order to ensure its electric generating units comply with the Clean Power Plan. As such, the rule would not require the state legislature to grant the Missouri Public Service Commission new powers. Missouri will not, as movants assert, need authority to mandate the construction of power plants,

require electric generating units to enter into power purchase agreements, or otherwise direct the actions of existing generators. Missouri already has a process established for the addition of new generation capacity through construction and power purchase agreements.

14. A properly structured emissions trading program could integrate seamlessly with the regional competitive electricity markets and provide appropriate economic incentives for operators of electric generating units to reduce emissions — without any need for central planning or direction from the Missouri Public Service Commission. Under the Clean Power Plan, those having operational control of electric generating units will continue to make decisions about the amount and type of generation to construct and operate, given a wide array of economic and regulatory considerations.

15. Contrary to the assertions of movants that state planning for the Clean Power Plan would require burdensome coordination among state agencies, interaction among agencies is already routine. Since the issuance of the proposed rule on the Clean Power Plan, the Department of Natural Resources and the Missouri Public Service Commission have been engaged in communication with each other and with stakeholders on the subject. As Chairman of the Missouri Public Service Commission I observed significant collaboration between state agencies on a wide range of issues. As a Board Member of the SPP Regional State Committee and the OMS, I am aware that the Missouri Public Service

Commission is in frequent contact with SPP and the Midcontinent Operating System ("MISO") regarding the precise matters that would necessitate coordination under the Clean Power Plan. There is also a very strong working relationship among public utilities commissioners in the SPP and MISO regions, facilitated by organizations such as the SPP Regional State Committee and the OMS.

16. In addition, regulators and owners of electric generating units in Missouri have extensive experience administering and complying with emissions trading programs for non-greenhouse gas pollutants.

17. One of the objectives of the Missouri Public Service Commission in discharging its duties as the energy regulator is to provide a clear path forward for market participants in the form of regulatory certainty. Missouri will therefore seek public input and engage in a planning process regarding the state's implementation of the Clean Power Plan. A stay of the Clean Power Plan would derail this process, further prolonging market uncertainty and hindering the ability of affected business in Missouri from making informed investment decisions.

Missouri Has Readily Available Opportunities for Fulfilling the Clean Power Plan

18. Existing electric generating units in Missouri are well-positioned to comply with the Clean Power Plan due to the state's and utilities' established mechanisms for investing in renewable energy, energy efficiency, and other

clean energy programs. For example, the state already has mechanisms in place to increase the deployment and utilization of renewable energy.

19. The state programs have already helped deploy clean energy resources will continue to reduce emissions from existing electric generating units in the years ahead. Renewable energy resources that have been incorporated into the energy mix purchased by Missouri utilities continue to displace fossil fuel-fired generation, reducing overall emissions and fossil generation. Clean energy resources that have been developed since 2012 and that will continue to be developed through 2030 will also assist owners and operators of existing electric generating units in complying with Clean Power Plan.

20. Missouri has the resources and ability to dramatically increase renewable energy generation. Missouri has tremendous potential for wind energy. Missouri already has an installed wind capacity of 459 MW and has six wind projects online. The DOE Wind Vision Scenario projects that Missouri could produce enough wind energy by 2030 to power the equivalent of 1.5 million average American homes. The National Renewable Energy Laboratory estimates that Missouri's land-based technical wind potential at 110 m hub height is over 340,000 MW. Missouri utilities have contracted for even more wind located outside of the state. Because Missouri's regulated utilities operate in a regional transmission organization, wind generation is always dispatched, when available, reducing the need for the dispatch of electric generating units.

Missouri utilities have access to high-capacity factor, low-cost wind resources in SPP and MISO that can be used in far greater quantities than they are now to help achieve Clean Power Plan compliance.

21. Based on my experience, renewable energy projects generally have a much shorter lead time from permitting to generation, relative to fossil fuel electric generating units and other types of electric generating units. If wind turbines and other large project components have been ordered and preliminary site work has been completed, the time required for on-site construction can be as short as a few months. Most wind project financing, including equity and debt, is typically arranged late in the development cycle after all of the following approvals have been obtained and the decision to proceed to construction has been made. Moreover, in nearly all cases the wind project developer incurs all development costs and the utility purchaser is not responsible for any costs until a power purchase agreement is signed or a deal to purchase the wind project is closed. Claims by movants that wind project financing requires a significant lead time and therefore financial commitments must be made by utilities in the next several years for wind projects that will be used for Clean Power Plan compliance are false.

22. Each of the utilities in Missouri has teamed up with renewable developers and others to develop policies to incorporate alternative energy sources into the electricity mix of Missouri. The Missouri Renewable Electricity Standard

(MoRES) is an energy initiative that was voted for and passed in 2008, becoming effective in September 2010. Proposition C, as it was named, requires Ameren Missouri, Empire District and Kansas City Power & Light to utilize renewable energy resources as a percentage of the total sales that each utility makes to its customers throughout the state. Proposition C requires 15 percent of the state's generated electricity to come from renewable energy sources by 2021.

23. Utilities are required to file compliance plans by April 15 each year describing how they will meet the standard for the current year and the two subsequent years. Utilities are also required to file annual reports demonstrating compliance with the standard by April 15 after the most recently completed year.

24. Missouri would not necessarily need to modify its existing clean energy programs, such as the MoRES, in order to comply with the Clean Power Plan. Electric generating units in Missouri could utilize renewable energy to meet Clean Power Plan requirements without any change to existing programs. The policy changes Petitioners' declarants describe would be entirely optional and would not need to be implemented, or even considered, during the period of litigation. To the extent that Missouri chose to make any amendment, such as extending the end date for the MoRES, that could easily be done as a

complement to its state plan to comply with the Clean Power Plan and would not need to be done formally in that plan.

The Clean Power Plan Will not Alter Missouri Public Service Commission's Traditional Roles

25. Based on my experience, the Clean Power Plan would not substantially change the Missouri Public Service Commission's traditional role of overseeing utility investments, reliability, and electric rates.

26. Missouri power companies participate in wholesale markets operated by SPP and MISO, and regulated by the Federal Energy Regulatory Commission. Under emissions trading programs for carbon pollution, owners of electric generating units would incorporate the costs of obtaining emission credits or allowances into the bids that are used to set the energy market clearing price and determine the dispatch order in the SPP real-time and day-ahead energy markets. The Missouri Public Service Commission, which does not oversee wholesale electricity markets, would not incur an administrative burden in connection with offers submitted into the wholesale market.

27. The Missouri Public Service Commission does not determine environmental compliance strategies for Missouri electric generating units under this competitive market structure. It would be up to owners and operators of Missouri electric generating units to determine how best to comply with environmental requirements. Owners and operators could choose whether to

upgrade their plants to reduce carbon emissions, reduce the amount of dispatch of the plants through increasing offer prices or using them primarily during times of the years when more capacity is needed, purchase emissions allowances, or retire some plants. No prior ratemaking proceeding under Missouri's authority would be necessary.

28. Missouri has a robust, multilayered system to maintain electric reliability that will continue to serve the state's electricity consumers during the implementation of the Clean Power Plan. The rule should not result in increased costs for reliability planning and other measures, as any reliability needs related to the Clean Power Plan can be incorporated into these existing processes. The Missouri Public Service Commission holds hearings and performs investigations pertaining to reliability for resourceadequacy.

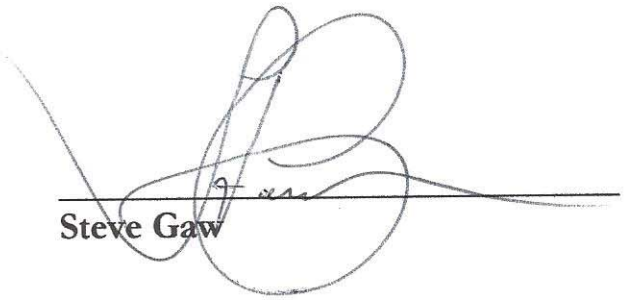
29. SPP, the regional transmission organization serving the western part of the state, and MISO, in which Ameren is a member, help to ensure reliability by, among other things, monitoring the transmission system. SPP also serves as the reliability coordinator for three of the regulated utilities in Missouri and assures compliance with the national reliability standards approved by FERC.

30. In the recent past, SPP has moved swiftly to reinforce the reliability of the Missouri electric grid within its footprint. All utilities now must meet rigorous requirements pertaining to planning, staffing, and other needs to maintain reliability, and are subject to penalties if they fail to do so. In addition, SPP

maintains a reserve margin that is designed to ensure sufficient generating capacity is available to meet demand several years in advance. These overlapping institutions and processes will continue to be available to protect reliability going forward as the Clean Power Plan is implemented.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Holts Summit, Missouri on December 7, 2015.



Steve Gaw

DECLARATION OF GREG GELLER

ON BEHALF OF ENERNOC, INC.

I, Greg Geller, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief.

1. I am a Director for Regulatory and Government Affairs at EnerNOC. In this position, I advocate for policies and regulatory constructs that incentivize more intelligent, cost-effective use of energy. I have regulatory and government responsibility for several states in the eastern half of the United States, wholesale activities involving the New York Independent System Operator, and engagement with the federal government.

2. EnerNOC is a leading provider of cloud-based energy intelligence software (EIS) and services to thousands of enterprise customers[1] and utilities globally. EnerNOC's EIS solutions for enterprise customers improve energy productivity by optimizing how they buy energy, how much they use, and when they use it. EnerNOC's EIS is a decision-support system for the enterprise featuring: budgeting and procurement, including an online auction platform and utility bill management; facility optimization; visibility and reporting, including capabilities for GRESB, ENERGY STAR, and other reporting standards; project

[1] Enterprise customers include commercial, institutional, and industrial customers.

tracking; demand management; and demand response. EnerNOC's EIS solutions for utilities and energy retailers provide customer engagement, energy efficiency, and demand response applications, all while improving operational effectiveness and ensuring that utilities meet demand-side management objectives. The Company works with utilities and grid operators to provide its demand response solutions throughout the United States, as well as internationally including in Australia, Canada, Germany, Ireland, Japan, New Zealand, and South Korea. EnerNOC believes that it is the largest provider of demand response in the world, measured by megawatts.

3. EnerNOC is a member of Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in connection with proposed-intervenor AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan"). In this declaration I will demonstrate that significant amounts of demand response and energy efficiency resources can be deployed quickly, cost-effectively, and reliably, and

that states, utilities, and EGUs should incorporate these resources into their compliance efforts for the Clean Power Plan.

4. Contrary to Petitioners' assertions, the Clean Power Plan will not jeopardize reliability. The Clean Power Plan expressly contemplates that Electric Generation Units (EGUs) and system operators will rely on customer-sited resources such as demand response[2] and energy efficiency measures to diversify the electricity grid—and improve reliability. See 80 Fed. Reg. at 64692. A more diverse grid enhances reliability by mitigating the impact of power plant generation outages, disruptions in fuel supply, and transmission failures.

5. For instance, during the polar vortex in 2014, several EGUs were unable to produce power, and demand response was credited by electric grid operators with preserving reliability. Indeed, PJM Interconnection, LLC, the electric grid operator for 13 mid-Atlantic and mid-western states and the District of Columbia, has stated in briefing before this Court that

> Although demand response is usually only needed by grid operators in the summer, operators also successfully deployed it during the power

[2] Demand response is defined by the Federal Energy Regulatory Commission as: "Changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized." See http://www.ferc.gov/industries/electric/indus-act/demand-response/dem-res-adv-metering.asp.

> emergencies occasioned by the bitter cold "Polar Vortex" weather in January 2014. As PJM set multiple winter peak records early that month, it called on demand response, and received more megawatts as load reductions than it could obtain as generation from all but the very largest generating stations. . . . In the midst of those challenging conditions, demand response—responding to PJM's dispatch as a wholesale market resource—helped maintain the reliability of the system."[3]

6. In addition to being reliable, the potential for demand response and energy efficiency is largely untapped and has significant growth capability. For example, the Federal Energy Regulatory Commission ("FERC") has found that, under an "Expanded Business as Usual Scenario," demand response can reduce peak energy demand by 82 GW in 2019—a 9% reduction in peak demand from a 2009 baseline.[4] As of the end of 2012, FERC reported that only 28.5 GW of this potential had been met, leaving over 50 GW of unrealized potential.[5] For reference, 50 GW is approximately equivalent to the combined demand for energy at any one time from the New England region and the states of New York and New Jersey. To put this 50 GW in the context of our nation's overall usage, FERC

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[3] Petition For Rehearing En Banc Of PJM Interconnection, L.L.C., *Electric Power Supply Ass'n v. FERC* at 10-11, No. 11-1486 (D.C. Cir. July 7, 2014).

[4] Federal Energy Regulatory Commission Staff Report, *A National Assessment of Demand Response Potential*, at xi (June 2009), http://docplayer.net/1100429-A-national-assessment-of-demand-response-potential.html.

[5] Federal Energy Regulatory Commission Staff Report, Assessment of Demand Response & Advanced Metering, at 9 (December 2014), http://www.ferc.gov/legal/staff-reports/2014/demand-response.pdf.

expected 950 GW of total peak load in the United States in 2019, so there is the potential for over 5% of expected peak load in the U.S. to be met with *incremental* demand response. This would result in a steep decrease in carbon emissions from Electric Generating Units.

7. A 2014 report about the Clean Power Plan prepared by Navigant Consulting for the Advanced Energy Management Alliance also confirms that demand response can result in significant reductions in peak energy demand—and reductions in carbon emissions under the Clean Power Plan:

> Overall Navigant estimates that [Demand Response, or "DR"] can directly reduce CO_2 emissions by more than 1 percent through peak load reductions and provision of ancillary services, and that it can indirectly reduce CO_2 emissions by more than 1 percent through accelerating changes in the fuel mix and increasing renewable penetration. For context, 1 percent of 2012 CO_2 emissions from affected sources under the CPP is 19.5 million metric tons. This emission reduction potential is significant when compared to the EPA's targets, which propose to reduce emissions from fossil-fuel power plants by 20 percent from 2012 levels by 2030. Navigant's analysis demonstrates that DR is able to provide valuable CO_2 emission reductions and should be a strategic part of implementation of the CPP.[6]

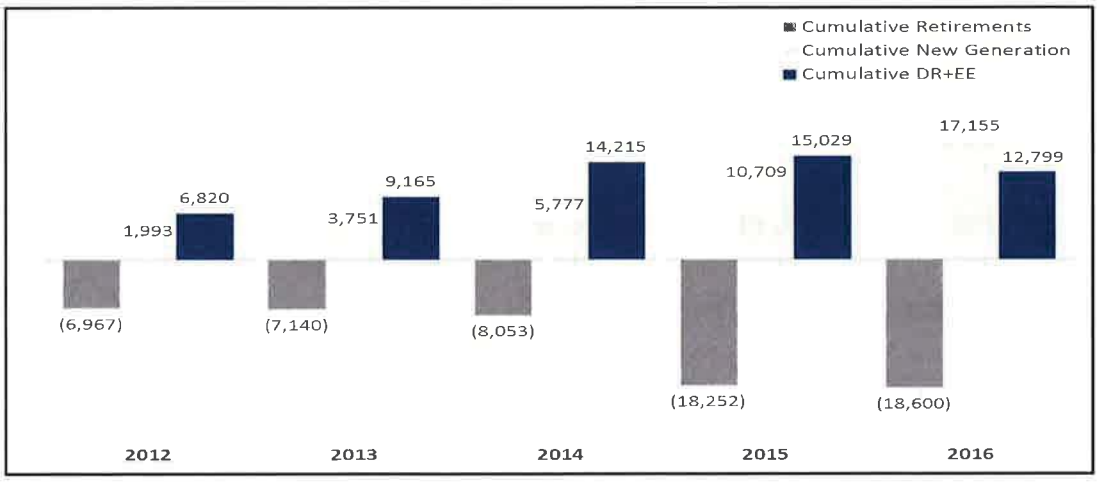
8. It is well within states' authority to implement policies and programs to enable these demand response scenario's to be met. When given proper signals, there is a proven track record of demand response being able to grow quickly, cost-

[6] Navigant Consulting. "Carbon Dioxide Reductions from Demand Response." November 25, 2014

effectively, and meet the reliability needs of the electric system when power plants retire. Figure 1 below approximates the growth of demand response and energy efficiency by MW in PJM's electricity grid, largely offsetting retirements from power plant generation.[7] The blue bars (on the right for each year) reflect the amount of demand response and energy efficiency that cleared in the PJM Base Residual Auction for that year. This auction is used to procure sufficient capacity for the electric system. Resources that can most cost-effectively meet these capacity needs "clear" the auction. By clearing, they secure an obligation to deliver energy when called upon in return for a fixed payment. In just two years, the amount of these resources that cleared in the auction grew by nearly 7,500 MW, or 7.5 GW. This is equivalent to over a dozen large power plants. With the right policies and programs, other regions of the country can grow demand response in a proportionally similar manner.

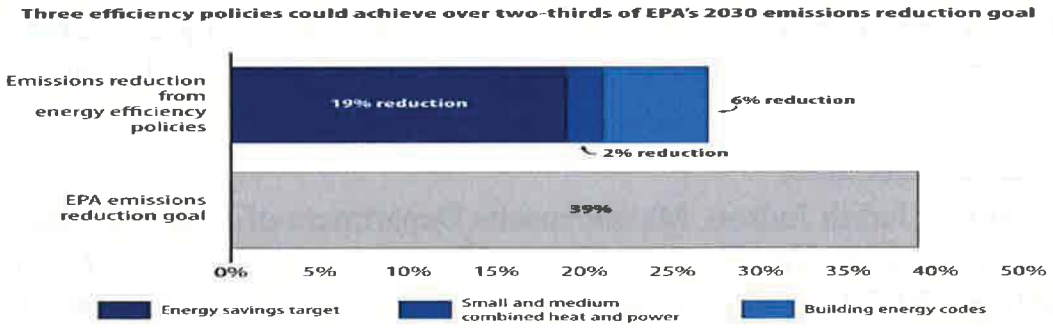
[7] Data comes from annual PJM Base Residual Auction reports, found on pjm.com.

Figure 1: Demand Response and Energy Efficiency in PJM



9. Even more than demand response, energy efficiency has the potential to help states meet their emissions goals. The American Council for an Energy Efficient Economy ("ACEEE") found that energy efficiency could help states meet more than two-thirds of their emission reduction targets, as depicted in Figure 2, below.[8]

Figure 2: Emission Reductions Required By The Proposed Clean Power Plan And Those Achievable Through Energy Efficiency Policies



[8] ACEEE, *States Don't Need to Gamble with EPA Rulemaking. Energy Efficiency Can Achieve Two-Thirds or More of Clean Power Plan Targets*, http://aceee.org/blog/2015/06/states-dont-need-gamble-epa.

10. Energy efficiency has also proven time and again that it can be deployed quickly and at large-scale. For instance, in the Commonwealth of Massachusetts, due to nearly 10,000,000 MWh of cumulative savings from energy efficiency programs since 2008, energy usage will be 15%-20% less in 2018 than it would have been without energy efficiency.[9]

The Clean Power Plan Will Not Increase Energy Costs

11. Petitioners also contend that the Clean Power Plan will increase energy costs. But states can reduce overall costs for their customers by leveraging demand response and energy efficiency as part of their compliance strategy for the Clean Power Plan. There are several examples of these resources lowering costs for consumers. Five such examples are described below:

- According to the Internal Market Monitor for PJM, demand response and energy efficiency saved PJM customers nearly $11,800,000,000 in costs in just one year.[10]
- The Commonwealth of Pennsylvania has energy efficiency and demand response programs under Act 129 of 2008. As of 2014, Act 129 had

[9] Commissioner Judith Judson, Massachusetts Department of Energy Resources, *Restructuring Roundtable: The Next Wave of State Energy Efficiency Plans in New England* (June 19, 2015), http://environment.harvard.edu/events/2015-06-19-130000-2015-06-19-163000/new-england-electricity-restructuring-roundtable.

[10] Monitoring Analytics, Analysis of the 2013/2014 PJM Base Residual Auction Revised and Updated, at 53 (September 20, 2010), http://www.monitoringanalytics.com/reports/Reports/2010/Analysis_of_2013_2014_RPM_Base_Residual_Auction_20090920.pdf.

delivered $4.2 billion in benefits with only $1.8 billion in costs for Pennsylvania customers.[11]

- Since demand response and energy efficiency reduce the need for power to be delivered from central station generation to end-use customers, they can defer or avoid the construction of costly new transmission lines. For instance, in New England, energy efficiency was credited with deferring $260 million worth of transmission upgrades.[12]

- A recent report from Navigant Consulting released by Advanced Energy Economy highlighted that using demand response and energy efficiency to reduce peak demand in Illinois could save customers $2.62-$2.73 for every $1.00 spent. In Massachusetts, that number increases to $3.26-$4.07 for every $1.00 spent when using demand response to reduce peak load.[13]

- The American Council for an Energy Efficient Economy found that energy efficiency is two-to-three times less expensive than traditional sources of power.[14]

12. Petitioners contend that it will be impossible to meet the Clean Power Plan's compliance deadlines because it will take many years to build new gas-fired plants or other generation units. But as described above, energy efficiency and

[11] Prepared Testimony of James H. Cawley, Commissioner, Pennsylvania Public Utility Commission, before the Pennsylvania House of Representatives, Consumer Affairs Committee Hearing on the Costs and Benefits Associated with the Overall and Peak Load Reductions Required by Act 129 of 2008, at 1 (February 25, 2014), http://www.puc.state.pa.us/general/pdf/testimony/Cawley-House-Act129_022514.pdf.

[12] Presentation given by Steven Rourke, Vice President of System Planning at ISO-NE, Draft 2013 Energy-Efficiency Forecast (February 15, 2013).

[13] AEE, Peak Demand Reduction Strategy, at 35 (Oct. 2015), http://info.aee.net/peak-demand-reduction-report.

[14] Maggie Molina, The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs, (March 2014), http://aceee.org/sites/default/files/publications/researchreports/u1402.pdf.

demand response can be deployed in a large-scale fashion in just one-to-two years. Energy efficiency also has an established track record of growing quickly, and can continue to grow long after programs have been implemented. For instance, in Maryland, where robust programs have been in place for several years, utility programs are expected to save 2.3 million MWh from 2015-2017 as a result of energy efficiency programs.[15] That does not include other forms of energy efficiency not funded by utilities, and is the equivalent of running a medium-sized power plant for the majority of the year.

13. In sum, states, utilities, and EGUs can leverage energy efficiency and demand response as part of their compliance efforts for the Clean Power Plan, while reducing costs and improving reliability.

Dated: December 4, 2015

Greg Geller
Director, Regulatory and
Government Affairs
EnterNOC

[15] Public Service Commission Of Maryland, The EmPOWER Maryland Energy Efficiency Act Standard Report of 2015, at 2 (April 2015), http://www.psc.state.md.us/wp-content/uploads/2015-EmPOWER-Maryland-Energy-Efficiency-Act-Standard-Report.pdf.

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF MICHAEL GOGGIN

I, Michael Goggin, declare as follows:

1. I am the Senior Director of Research at the American Wind Energy Association ("AWEA"). In that role I oversee AWEA's wind industry data collection and analysis, as well as analysis related to wind's integration onto the power system. I hold a B.A. with honors from Harvard University and have been employed by AWEA since February 2008. This Declaration makes four main points in response to claims

that were made in Petitioners' stay requests and declarations.

2. I am submitting this declaration in connection with the proposed-intervenor AWEA's brief in opposition to Petitioners' motions to stay implementation of the Clean Power Plan.

3. The purpose of my declaration is to provide information to the Court relating to the question of whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

4. In preparation for this declaration, I have become familiar with: (a) the Clean Power Plan (CPP); (b) the Petitions for Stay; and (c) the declarations thereto. In addition, I am acquainted with the other documents cited in this declaration.

6. My declaration addresses the following:

   a. There is no need to add new wind generation in the immediate future to meet Clean Power Plan targets, and to the extent needed, it can be added quickly without incurring project development costs in the near future. *See* ¶¶ 5-56.

   b. Transmission is not a limiting factor for Clean Power Plan compliance. *See* ¶¶ 57-82.

   c. Electric Reliability is not a concern and will not cause near-term costs for states and utilities. *See* ¶¶ 83-104.

   d. Capacity and coal plant retirement concerns can be easily addressed. *See* ¶¶ 105-123.

e. Renewable energy can be readily used for compliance without new state authority, regardless of the compliance pathway chosen in state plans. *See* ¶¶ 124-128.

f. Harm to wind industry from a stay. *See* ¶¶ 129-142.

New wind generation can be added quickly, rebutting claims that utilities must incur project development costs in the near future to comply with the Clean Power Plan

5. The claim in the Petitioners' brief and declarations[1] that states and utilities will need to incur immediate costs to begin developing low-carbon generation to comply with the Clean Power Plan is incorrect for a number of reasons. First, nearly all wind projects are developed by private developers, so no cost or risk is incurred by the utility until a Power Purchase Agreement ("PPA") to buy the output of the wind project or a contract to purchase the wind project is signed. The signing of a PPA or a wind project purchase agreement typically occurs a year or two prior to a wind project's in-service date, and sometimes even after a wind project has become operational.

6. Wind developers currently have a backlog of dozens of Gigawatts of proposed wind projects that can be built quickly, as time-intensive steps such as resource assessment, permitting, and interconnection studies have already been completed. In addition, the full development cycle for a wind project is sufficiently short that even projects for which no development steps have begun could be brought online before the start of Clean Power Plan ("CPP") compliance requirements.

[1] *See, e.g.,* Okl. Mot., Exh. 1, Wreath Decl. ¶ 9.

As a result, there will be no shortage of wind projects available for utilities to use for CPP compliance if they chose to do so in the future, and utilities need not bear any cost for developing those projects in the near term.

7. Because either signing a PPA or purchasing a late-stage wind project from a developer is always an option for a utility, no utility can correctly argue that they must incur cost or risk in the next several years for developing wind projects for CPP compliance. Real-world experience confirms that utilities can add a large amount of wind generation in a short period of time and without incurring any cost prior to signing a purchase contract, whether for a PPA or direct project ownership, indicating a stay is not necessary for utilities to avoid near-term development costs for generation to comply with the CPP.

8. As of the end of 2014, more than 77 percent of the total installed wind capacity in the U.S. is owned by Independent Power Producers (IPPs) and sold to utilities and other electricity users under Power Purchase Agreements (PPAs). Around 15 percent of the total U.S. wind capacity was directly owned by utilities as of the end of 2014,[2] while most of the remaining 8 percent are merchant wind projects that sell their output into wholesale power markets without a long-term contract.

9. Moreover, for around half of the 15 percent of wind capacity that is directly owned by utilities, it has been publicly disclosed that the project was initially developed by a private wind developer and sold to the utility at a later date.[3] This

[2] AWEA Annual Market Report (2015), *available at* http://www.awea.org/marketreports.

[3] AWEA Market Database Pro, *available at* http://www.awea.org/Resources/Content.aspx?ItemNumber=5728&navItemNumber=5776.

likely greatly understates the share of utility-owned wind projects that were initially developed by a private developer, as in many cases the sale of a potential project to a utility is not publicly reported, particularly for projects for which some development work has been completed but construction work has not yet begun. In particular, utility purchases of proposed wind projects that are in early stages of development are typically not publicly reported. However, because few utilities have the in-house expertise and risk appetite to conduct early stage wind project development, the initial development work for the vast majority of wind projects that are ultimately purchased by utilities is done by private developers.

10. Therefore, for at least 90 percent of wind projects, and likely essentially all wind projects, the utility incurs no cost or risk for developing a wind project until very late in the development process, ensuring that utilities need not incur any costs for procuring generation to comply with the CPP until many years from now at the earliest. This is true regardless of whether a utility pursues direct wind project ownership or a Power Purchase Agreement. As established later in this declaration, many if not all utilities could secure CPP compliance, particularly for the early CPP compliance targets, through the procurement of wind energy alone.

11. Most wind project PPAs are signed very late in the wind project development process, sometimes even after a wind project has become operational. This is possible because, as the wind industry has matured, wind project developers have gained greater access to capital markets, enabling developers to secure financing to build wind projects for which they have not yet secured a long-term power purchaser. AWEA examined data for the approximately 29,600 Megawatts (MW)

of U.S. wind capacity for which a power purchase agreement signing date has been publicly disclosed,[4] which accounts for more than half of all wind projects with a PPA. For these projects, PPAs were signed between four years prior to when a project began producing electricity to two and one-half years after a wind project became operational. On a capacity-weighted basis, the average PPA in this sample was signed less than a year before the wind project became operational. Around 2,900 MW of PPAs were signed for wind projects in the same calendar year quarter that the projects came online, with another 2,900 MW signed at least one calendar year quarter after the wind project became operational. Overall, more than 27,500 MW of the 29,600 MW of projects for which PPA signing dates are available were signed less than 2.5 years before the wind project became operational.

12. As a result, at this point in time a utility can wait at least several more years to sign a contract for wind generation and still have that wind generation online by the 2022 start of the CPP compliance time period, or even the 2020 start of the Clean Energy Incentive Program crediting period. While the signing of a PPA is the best indicator of when a utility makes a generation procurement decision for which it will incur irreversible costs, as a PPA is a legally-binding contract, it should be noted that utilities that purchase wind energy under PPAs typically only begin to incur costs when the wind project becomes operational and the utility begins paying for electricity delivered under that contract, further delaying the

[4] *Id.*

date at which CPP-related costs will actually be incurred.

13. The claims made by many utility declarants in the Petitioners' case about the lengthy amount of time it takes to procure new low-carbon generation are directly rebutted by the short timeframe in which those utility declarants have previously purchased wind energy. For example, in his declaration Tri-State's CEO McInnes states that "Decisions about replacement generation need to be made many years in advance to allow adequate time for planning, permitting, and construction. If the Rule is not stayed, Tri-State will need to begin making these decisions now, and once these decisions are made, they cannot be reversed without harm to Tri-State."[5] However, Tri-State has previously bought wind generation under two PPAs, and those wind projects were brought online the same year or the year after the signing of those PPAs.[6]

14. A number of other electric cooperative declarants similarly argue that the long lead time to bring new generation online would require immediate action if projects are to be online by the start of CPP compliance. National Rural Electric Cooperative Association (NRECA) declarant Johnson summarizes those claims by stating that "Cooperatives must engage in capital project planning years before making any new investments. Building new generation resources and related infrastructure in particular requires many years of advance planning. To construct

[5] McInnes Decl. ¶ 13.

[6] The 91 MW Colorado Highlands project began producing power in 2012 after the PPA was signed in 2012, and the 51 MW Kit Carson Project became operational in 2010 after the PPA was signed in 2009.

a new power plant or renewable resource, cooperatives must create a site plan, apply for the necessary permits, finalize technology studies, conduct transmission and interconnection studies, complete regulatory filings, confirm the fuel source, construct or contract for pipelines to be built or capacity to be used, if needed, sign construction contracts, and construct the new resource."[7] Johnson also states that "If G&Ts are required to materially increase their capital expenditures to comply with the 111(d) Rule, their equity-to-total-capitalization ratio will be adversely affected and will result in pressure on, and likely downgrading of, their credit ratings."[8]

15. There are several problems with these claims. First, they ignore the fact that over 80 percent of wind purchases by rural electric cooperatives are made through PPAs, as documented by the statement on NRECA's own website that "Co-ops own nearly 1.2 GW of renewable energy generation and have long-term power purchase agreements (PPAs) for nearly 5.2 GW."[9] Under a PPA, a utility does not need to incur a significant capital expenditure, as the capital cost is incurred by the wind project developer and the utility only pays for wind energy as it is delivered. Second, regarding timing, under either a PPA or direct ownership, the vast majority of utility contracts to purchase wind energy are signed within a year or two of a wind project coming online, rebutting the claim that utilities must

[7] Johnson Decl. ¶ 13

[8] *Id.* at ¶ 19

[9] NRECA, Renewable Energy, *available at* http://www.nreca.coop/nreca-on-the-issues/energy-operations/fuels/renewable-energy/.

incur costs in the immediate future for them to secure generation needed to comply with the CPP in 2022.

16. For example, NRECA member Associated Electric Cooperative, Inc. (AECI) has signed a number of PPAs for wind projects that became operational within a year or two of contract signing. Specifically, in 2011 AECI signed a PPA for 300 MW of capacity at the Flat Ridge 2 wind project in Kansas, which became operational in 2012. As another example, Western Farmers Electric Cooperative obtains around 17 percent of its electricity from wind energy through a number of wind projects that became operational within two years of signing a PPA, and some that became operational less than a year after signing a PPA.[10]

17. Utilities purchasing wind energy from other regions have also been able to bring those projects online within a short period of time after signing a PPA, demonstrating that even utilities without strong economic wind resources in their region can quickly add zero-carbon generation. In February 2015, Florida's Gulf Power filed a PPA to purchase 180 MW from the Kingfisher wind project in Oklahoma, which is expected to achieve commercial operations by the end of 2015. Similarly, in 2011 Alabama Power signed a PPA for a 235 MW wind project in Oklahoma that became operational in 2012, and in 2012 it signed a PPA with a 250 MW wind project in Kansas that came online in 2013.

18. This experience contradicts the statement in the Declaration by Alabama Power's Heilbron that "Alabama Power would have to begin activities immediately in

[10] WFEC, Our History, *available at* http://www.wfec.com/about-wfec/our-history.

2016 and 2017" to comply with the CPP because "new generation plants require from four to seventeen years to obtain regulatory approvals, plan, site, design, permit, construct, and commission."[11] A nearly identical statement appears in the declaration from Michael Burroughs with Gulf Power, as both utilities are owned by the same parent company.

19. PPAs are available as a procurement option for all utilities. However, even utilities that opt to own their wind projects can quickly bring them online, because in most cases utilities opt to buy a wind project from a developer who has completed development work ranging from some early development steps to fully completing construction of the project. Because either signing a PPA or a purchasing a late-stage project from a developer is always an option for a utility, no utility can correctly argue that they must incur cost or risk in the next several years for developing wind projects for CPP compliance.

20. As additional evidence that states and utilities need not incur any wind project development costs in the near future, private developers have begun resource assessment, permitting, and interconnection request work for a large number of wind projects that will be available for utilities to use for CPP compliance, either through a PPA or a utility purchase of these projects. Because these time-intensive steps have been completed or are well underway, these wind projects will be available in time for CPP compliance, and utilities need not incur any costs for buying these wind projects or their output for several more years at least.

[11] Heilbron Decl. ¶¶ 3, 7.

21. Once these preliminary project development steps have been completed, the time needed to build a wind project is quite short. If wind turbines and other large project components have been ordered and preliminary site work has been completed, the time required for on-site construction can be as short as a few months. Most wind project financing, including equity and debt, is typically arranged late in the development cycle after all of the following approvals have been obtained and the decision to proceed to construction has been made. Moreover, in nearly all cases the wind project developer arranges financing, and as explained above the utility purchaser is not responsible for any costs until a PPA is signed or a deal to purchase the wind project is closed. Claims made in some Petitioners' declarations that wind project financing requires a significant lead time and therefore financial commitments must be made by utilities in the next several years are false.

22. Under the two most recent extensions of the renewable Production Tax Credit ("PTC") and the accompanying Internal Revenue Service ("IRS") rules[12] for the "safe harbor" provision that most wind projects use to qualify for the PTC, wind projects have had to come online within about two years of passage of extensions of the PTC to ensure they qualify for the credit. As a result, utilities, wind developers, and wind turbine manufacturers have become adept at completing all steps of project development that impose large irreversible costs, such as securing

[12] IRS, Beginning of Construction for Purposes of the Renewable Electricity Production Tax Credit and Energy Investment Tax Credit, *available at* https://www.irs.gov/pub/irs-drop/n-13-29.pdf.

financing and manufacturing and installing the turbine and other expensive components, in under two years. As discussed in more detail later in this section, utilities of all type have demonstrated their ability to bring a large amount of new wind generation online, through both direct ownership and PPAs, within the two year window provided under current IRS rules to qualify for PTC.

23. Publicly available data from a number of sources indicate that dozens of Gigawatts (GW) of proposed wind projects have completed the steps necessary for a wind project to be completed in under two years, while many more proposed wind projects are at varying stages of completing those steps. Not all wind projects that complete these steps ultimately proceed to construction, while other wind projects that have not yet completed these steps can and almost certainly will complete all necessary development steps and come online before the 2022 start date of the CPP or the 2020 start of the Clean Energy Incentive Program. As a result, the following numbers are only provided to indicate the large number of wind projects that are currently under development that could be completed on short notice if a utility were interested in buying wind energy for CPP compliance in the future.

24. Applying for a Federal Aviation Administration (FAA) permit is one essential step that must be completed before a utility-scale wind project can be placed in service. Public FAA data show that applicants have applied for permits for 28,282 utility-scale wind turbines since January 1, 2013, but have not yet provided FAA with a build date, indicating those wind projects have likely not yet become operational. 28,282 proposed utility-scale wind turbines at the 2014 average

turbine size of 1.94 MW equals around 55,000 MW of wind projects that have applied for FAA permits since 2012. These FAA applications cover proposed wind projects in 43 states, and approximately 66% of those turbine proposals were submitted since the beginning of 2014.

25. Some Petitioners' Declarations incorrectly claim states and utilities would need to begin permitting work in the near future so that wind plants could be built in time for CPP compliance. 98.8 percent of wind capacity installed to date has been built on private land, where the permitting requirements and timeline for obtaining them are much shorter than for wind projects on federal lands, so in many cases near-term permitting applications would not be necessary for wind projects with proposed 2022 in-service dates.[13] Moreover, many of the dozens of GW of proposed wind projects that are currently under development have likely already applied for or even obtained any needed state and local permits. Regardless, as explained above, in almost all cases private wind project developers incur all costs for developing a wind project, including permitting costs, up until a PPA or sale agreement is closed with a utility, which is typically immediately before a wind project becomes operational. In addition, in many jurisdictions the private wind project developer that applies for a siting permit pays an application fee and the cost of any siting studies, so there is no merit to the claim that those costs would be imposed on a state permitting office. To the extent states are incurring any cost, it is insignificant and would be incurred in the absence of the CPP because

[13] AWEA Annual Market Report (2015), *available at* http://www.awea.org/marketreports.

generation projects are being developed and permitted anyway and such permitting is a routine function of government. As a result, there should be no significant near-term cost to states or utilities associated with permitting wind projects that private developers may begin to develop in anticipation of CPP demand.

26. Applying to interconnect to the transmission system by securing a place in the interconnection queue is another essential step for a proposed wind project. This step typically requires a sizeable and non-refundable deposit from the project developer to begin the interconnection study process, and all study costs are typically paid by the project developer.[14] The Department of Energy's (DOE's) 2014 Wind Technologies Market Report found 96 GW of proposed wind projects in the interconnection queues for all seven U.S. Independent System Operators (ISOs) and 28 large U.S. utilities outside of ISO regions.[15] Moreover, the DOE report documents that these proposed wind projects are spread across all regions.

27. Similarly, North American Electric Reliability Corporation (NERC) data show nearly 29 GW of planned wind projects in NERC's Tier 1 (under construction or have had planning requirements approved) and an additional 45 GW in Tier 2

[14] For example, see MISO, FAQs for Generation Interconnection, *available at* https://www.misoenergy.org/Planning/GeneratorInterconnection/Pages/GenerationInterconnectionFAQ.aspx.

[15] DOE, 2014 Wind Technologies Market Report, at 13-14, *available at* https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.

(have requested but not received approval for planning requirements),[16] for a total of 74 GW of proposed wind projects in development.

28. Energy industry data and analysis firm SNL Energy similarly states that "There are 49 GW of wind capacity in various stages of development across the U.S.; 9,502 MW, or 19%, is under construction. Another 6,103 MW, or 13%, is currently in advanced development. SNL Energy considers a project to be in advanced development when two of the following five criteria are met: financing is in place, a power purchase agreement is signed, turbines are secured, required permits are approved or a contractor has signed on to the project."[17]

29. Public statements by wind project developers also indicate a large number of wind projects are in some stage of development. Wind developers responsible for approximately 51% of cumulative U.S. wind development have recently made public statements indicating that they have at least 28,500 MW of additional wind projects under development.

30. This number is almost certainly a major underestimate of the quantity of wind projects currently under development. Notably, many early stage wind project developers who typically sell their projects to a utility or another developer before they commence construction are not included in this tally. These early stage developers account for a large share of wind projects that are ultimately built. In

[16] NERC, 2014 Long-Term Reliability Assessment, *available at* http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf.

addition, some of the largest wind developers do not disclose any information about how many wind projects they have under development, and these large developers have the greatest resources to fund early stage project development. As a result, the development figures presented in public statements grossly understate the actual quantity of wind projects under development.

31. These wind project development figures include projects for which local and state permitting, land acquisition, wind resource data acquisition, and other developed steps have begun and may even have been completed. Many of these wind projects could be ready to move forward into interconnection queues and other steps towards being constructed if developers perceive there will be increased demand from utilities and other buyers. Moreover, many more new wind projects could rapidly enter development in response to an increase in demand, such as the demand for wind energy driven by the CPP, and even these new wind projects could be ready well in advance of the start of CPP compliance in 2022.

32. Importantly, the total development timeline for a wind project is sufficiently short that a new project could not yet have begun any steps towards development at this point and still be ready to commence construction and enter commercial operations by the time the CPP takes effect in 2022, or even by the time CEIP crediting begins in 2020. The typical development timeline for a wind project, from start to finish, can be as short as three years.[18]

[18] Wayne Walker, An Overview of the Wind Power Project Development Process and Financial Performance of Wind Energy Projects, *available a*t http://www.fws.gov/habitatconservation/windpower/Past_Meeting_Presentations/Walker.pdf.

33. In addition, that total development timeframe is shortening as the wind industry matures. With greater experience, improved methods, and greater financial resources, wind plant developers can significantly shorten that development timeline. The short eligibility timelines afforded under recent PTC extensions have further incentivized wind project developers to devise methods that enable them to quickly complete project development steps.

34. Many more wind plants that are operating or will be operational in the near future are also eligible to be used for CPP compliance, but have not yet signed a PPA or been purchased by a utility. This includes around 2,950 MW of operating wind projects completed after 2012 that have not disclosed a utility buyer and are currently selling their output into wholesale electricity markets on a merchant basis, and nearly 5,400 MW of wind projects that are under construction but have not disclosed a utility buyer, for a total of around 8,350 MW of wind capacity that appears to be available to a utility purchaser interested in using it for CPP compliance.

35. In addition, unmet state Renewable Portfolio Standard requirements are expected to drive around 150 TWh/year of additional renewable energy supply by the year 2025, the equivalent annual output of about 50 GW of wind capacity.[19] Most if not all of this additional renewable capacity can be counted for compliance with

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Jerry Grundtner, The Future of Wind Energy, *available at* http://www.scranet.org/sites/scra/files/pdfs/2011crw/Grundtner.pdf.

[19] AWEA RPS Market Assessment 2015. RPS demand from California increasing its RPS from 33% to 50% in September 2015 is not included in this total.

the CPP, as all post-2012 renewable energy additions can be used for CPP compliance.

36. All of these operating, under construction, under development, and potential new wind projects can be available to utilities to use for CPP compliance, regardless of their location and the compliance pathways chosen by states.[20]

37. Typically, the most direct way in which renewable energy can be used and credited for CPP compliance is by directly displacing fossil generation that otherwise would have been used as part of a state or utility's generation mix, reducing emissions and facilitating compliance with the CPP. Under other circumstances, such as interstate renewable energy purchases, renewable energy can also be credited through the following means.

38. Under a rate-based compliance pathway, the entity retaining the environmental attributes from a wind project's output will be directly credited towards compliance at the emissions rate of the state where the wind project is located. That credit is conveyed through emission reduction credits ("ERCs"), which can either be used directly for CPP compliance or sold to another entity. Even if the state where the wind project is located chooses not to participate in interstate ERC trading with the state where a utility or EGU owner has a CPP compliance obligation, the ERCs will have significant financial value in the state where they are generated that compensates the entity purchasing the wind plant's

[20] This rebuts the claim made in the Patton Decl. ¶ 27, and other Petitioner declarations, that the value of renewable generation for CPP compliance is uncertain until states decide on a compliance pathway.

environmental attributes for the plant's lack of carbon emissions.

39. Under either a rate- or mass-based system, wind projects developed anywhere in the country will also be economically compensated for their lack of emissions because the wholesale electricity market price, or the cost of competing generation if one is outside of an organized market, will be higher due to the CPP. This is because the cost of purchasing CPP mass-based carbon allowances or rate-based ERCs will be factored into the marginal production cost of fossil-fired generators, driving the wholesale electricity market clearing price and the cost of competing fossil generation higher. The cost of wind generation would not increase because wind generation produces no carbon emissions, and this higher revenue resulting from the higher market price or the less competitive price from competing generation would directly compensate the wind plant for wind's role in providing emissions reductions to meet the CPP.

40. Under either a rate- or mass-based system, to the extent a state or utility develops a wind project in the same electrical Balancing Authority as its footprint, which many will likely do anyway, the carbon emissions of fossil-fired generators in that state and utility would be reduced as the generation from those fossil generators is displaced by the wind generation, also facilitating CPP compliance.

41. Finally, under a mass-based system, to the extent a state opts to allocate emissions allowances to renewable energy, either to comply with the proposed leakage provisions under the existing source-only CPP requirements or for other policy reasons, wind generation will be further directly compensated for its contribution to CPP compliance by receiving valuable carbon allowances that it can sell to

those with a compliance obligation.

42. Given the large quantity of wind projects that are under development and new wind projects that could be deployed in time to be used for CPP compliance, all states and utilities could secure CPP compliance through the procurement of wind energy and other resources that can be deployed on similarly short notice, such as energy efficiency, other renewables, and increased generation at existing gas power plants. Given the short timeline for deploying these resources, states and utilities would not need to incur any cost for developing these resources in the next several years and still use them to fully secure CPP compliance.

43. This is particularly true for the first interim compliance period in 2022-2024, as most states are well on track to achieve their emission reduction obligations for that time period. Specifically, analysis by the Union of Concerned Scientists shows that, after accounting for emission reductions that are already in process due to existing commitments, under rate-based compliance at least 21 states are already on track to surpass their 2022 emission reduction targets, while at least 31 states are on track to be more than halfway towards meeting their 2022 targets.[21] Moreover, at least 16 states are already on track to achieve their 2030 rate-based emission reduction targets. More states are in an even better compliance position under a mass-based system in their analysis, with 28 states on track to exceed their 2022 targets, 36 states more than halfway to those 2022 targets, and 24

[21] Union of Concerned Scientists, States of Progress, *available at* http://www.ucsusa.org/sites/default/files/attach/2015/08/States-of-Progress-Update-Slidedeck.pdf.

states more than halfway to their 2030 targets.

44. The quantity of viable wind energy resources that could be quickly deployed far exceeds Building Block 3 and even total CPP compliance obligations. The National Renewable Energy Laboratory (NREL) has quantified the wind energy resource for each state using technology assumptions for current wind turbines (assuming 110 meter turbine hub heights) as well as future wind turbine technology (assuming 140 meter turbine hub heights).[22] According to NREL's wind resource assessment, all states have large quantities of viable wind energy resources using current technology, with a national wind resource in excess of 10,000 GW. For comparison, this is around 10 times larger than the installed capacity of all power plants in the United States. Assuming the use of larger and more productive wind turbines in the future further expands the potential wind resource in many states.

45. DOE and NREL recently completed the comprehensive Wind Vision analysis, which assessed the full cost of developing available wind energy resources in all regions, including grid connection costs. The resulting wind energy supply curves show a massive quantity of economically feasible wind resources in all regions.[23] Notably, this analysis is conservative, particularly for much of the Eastern U.S., as

[22] National Renewable Energy Laboratory, Estimates of Wind Energy Potential by States, *available at* http://apps2.eere.energy.gov/wind/windexchange/docs/wind_potential_80m_110m_140m_35percent.xlsx.

[23] DOE, Wind Vision Appendices, at 62, 110-112, *available at* http://www.energy.gov/sites/prod/files/wv_appendix_final.pdf.

it assumes the use of turbines with an 80 meter hub height.[24] As documented in the following section, 100 meter or greater towers already account for the majority of recent installations in the Eastern U.S., with 90-100 meter towers accounting for a large share of the remainder.[25] 110 to 120 meter towers are commonly commercially deployed in Europe today and are beginning to be deployed in the U.S.[26]

46. As noted by updated wind resource maps released by NREL and the DOE, taller turbine towers and other technological advances are opening up large new areas for economic wind development, particularly in the Eastern U.S.[27] As documented by NREL's state-by-state wind resource data,[28] moving from 80 meter hub heights to 110 meter hub heights increases the viable wind resource in most Eastern U.S. states by an order of magnitude or more. The increasing cost-effectiveness of wind energy in all regions is confirmed by data released by

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[24] *Id.* at 72.

[25] DOE, 2014 Wind Technologies Market Report, at Fig. 27, *available at* https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.

[26] Des Moines Register, MidAmerican Building Tallest Land-Based Wind Turbine, *available at* http://www.desmoinesregister.com/story/money/2015/11/16/midamerican-building-tallest-land-based-wind-turbine/75874738/.

[27] See 110 meter and 140 meter wind resource maps in DOE, Enabling Wind Power Nationwide, *available at* http://energy.gov/sites/prod/files/2015/05/f22/Enabling-Wind-Power-Nationwide_18MAY2015_FINAL.pdf, and Mapping the Frontier of New Wind Power Potential, *available at* http://energy.gov/eere/articles/mapping-frontier-new-wind-power-potential.

[28] National Renewable Energy Laboratory, Estimates of Wind Energy Potential by States, *available at* http://apps2.eere.energy.gov/wind/windexchange/docs/wind_potential_80m_110m_140m_35percent.xlsx.

DOE.[29] The role of technological advances in driving expanded wind development opportunity in all regions is further discussed in the next section, while the section following that discusses studies and grid operating experience that demonstrate very high levels of wind energy can be reliably integrated onto the power system.

47. Given the extent to which economically viable wind resources exceed the CPP needs of all states and regions, arguments made by some declarants that they lack sufficient renewable resources to meet the CPP are without merit. For example, Kansas[30] and Wyoming[31] argue that siting restrictions limit their ability to deploy renewable resources in sufficient quantity to meet the CPP. However, the NREL data show that, assuming the use of 80 meter wind turbines that are most commonly deployed in the U.S. Interior region, Kansas has more than 884 GW of viable wind energy resources and Wyoming more than 422 GW. Because such a large percentage of the land area in these states has viable wind resources, it is not credible to say that siting restrictions in some areas would prevent these states from meeting their CPP needs using wind energy. Moreover, because advances in turbine technology are expanding the areas in which wind turbines can be economically deployed, wind plant developers have more options for avoiding any siting restrictions. In addition, the CPP provides numerous options for states

[29] DOE, 2014 Wind Technologies Market Report, at Fig. 46, *available at* https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.

[30] Gross Decl. ¶ 3.

[31] Parfitt Decl. ¶ 5.

to use interstate renewable energy purchases for CPP compliance, and such interstate purchases are common today,[32] so even if a state did have limited options for deploying wind energy in-state it could source wind energy from other states.

48. The wind industry and its network of manufacturers and other suppliers is capable of meeting large growth in utility demand for wind energy, so supply chain constraints would not be a concern for the industry's ability to deliver wind turbines in time to be used for CPP compliance. In fact, EPA conservatively based its calculation of the Building Block 3 based on an average of the wind industry's demonstrated past performance in building and installing wind turbines. The industry could greatly exceed this average level of installation, as it notably has in prior years such as the record 13 GW installed in 2012. The wind industry has also demonstrated that it can quickly ramp up its supply chain, with the industry growing from 50,500 jobs in 2013 to 73,000 jobs in 2014. This is particularly true given the longer lead time associated with CPP demand that makes it possible to invest in manufacturing facilities and other aspects of the supply chain.

49. In addition, recent and ongoing cost reductions for wind energy make EPA's assessment of the achievable level of renewable deployment in its formulation of

[32] AWEA Market Database Pro. Analysis using this dataset in 2014 found that 13,000 MW, or more than 20% of the nation's installed wind generating capacity at that point in time, was under a PPA contract with a utility in a state other than the one in which the generation is located.

Building Block 3 likely to be conservative. Data from DOE[33] and Wall Street Investment firm Lazard[34] document that the cost utilities pay for wind energy has fallen by more than 60 percent since 2009, and solar has also experienced similar cost declines.[35] The DOE and NREL Wind Vision analysis projects that wind energy costs will continue to fall through the year 2030,[36] and DOE's SunShot analysis makes similar projections for solar energy costs.[37] NREL's recently-released Annual Technology Baseline also includes estimates for future costs for all energy technologies that show continued cost reductions for renewable energy resources.[38]

50. Analysis by DOE's Energy Information Administration and others confirms that renewable energy is poised to provide large contributions to cost-effectively achieving CPP compliance. EIA's analysis of the proposed CPP identifies a leading role for renewable energy in providing cost-effective compliance.[39]

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[33] DOE, 2014 Wind Technologies Market Report, at Fig. 46, *available at* https://emp.lbl.gov/publications/2014-wind-technologies-ma.

[34] Lazard, Levelized Cost of Energy Analysis 9.0, *available at* https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/.

[35] LBNL, Tracking the Sun VIII, *available at* https://emp.lbl.gov/publications/tracking-sun-viii-install

[36] DOE, Wind Vision Appendices, *available at* http://www.energy.gov/sites/prod/files/wv_appendix_final.pdf, Appendix H

[37] DOE, Sunshot Vision Study, *available at* http://energy.gov/eere/sunshot/sunshot-vision-study.

[38] NREL, Annual Technology Baseline, *available at* http://www.nrel.gov/analysis/data_tech_baseline.html.

[39] EIA, Analysis of the Impacts of the Clean Power Plan https://www.eia.gov/analysis/requests/powerplants/cleanplan/; AWEA summary available at

51. Some Petitioner declarants[40] express concerns about the CPP leading to changes in the generation mix that increase the risk of fuel price volatility. However, wind energy driven by the CPP can play a critical role in reducing that risk. EIA's analysis of the proposed CPP shows that, as the use of renewable energy ramps up to comply with the CPP, natural gas prices return to what they had been without the CPP in place.[41] Many utilities and state public utility commissions have recognized the value of wind energy for protecting consumers against fuel price risk,[42] as have various experts.[43] DOE's Wind Vision report found that expanding the use of wind energy made electricity prices 20 percent less sensitive to fuel price fluctuations.[44]

52. Many states and utilities have rapidly changed their resource mixes by adding a large amount of wind generation in recent years, confirming that states and

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EIA analysis shows wind is most cost-effective option for Clean Power Plan compliance, http://awea.files.cms-plus.com/AWEA%20report%20on%20EIA%20CPP%20analysis%20July%202015.pdf.

[40] *See, e.g.*, Steven Decl. ¶ 3; Bracht Decl. ¶ 11.

[41] AWEA, EIA Analysis Shows Wind Is Most Cost-Effective Option for Clean Power Plan Compliance, *available at* http://awea.files.cms-plus.com/AWEA%20report%20on%20U.S. Energy Information Administration %20CPP%20analysis%20July%202015.pdf.

[42] AWEA, Wind Power's Consumer Benefits, available at http://awea.files.cms-plus.com/AWEA%20White%20Paper-Consumer%20Benefits%20final.pdf.

[43] Lawrence Berkeley National Laboratory, Accounting for Fuel Price Risk: Using Forward Natural Gas Prices Instead of Gas Price Forecasts to Compare Renewable to Natural Gas-Fired Generation, available at https://emp.lbl.gov/publications/accounting-fuel-price-risk-using-forward-natural-gas-prices-instead-gas-price-forecasts, Lawrence Berkeley National Laboratory, Revisiting the Long-Term Hedge Value of Wind Power in an Era of Low Natural Gas Prices, *available at* https://emp.lbl.gov/sites/all/files/lbnl-6103e.pdf.

[44] DOE, Wind Vision Report, *available at* http://energy.gov/eere/wind/wind-vision.

utilities can wait several more years and still bring a large amount of wind generation online in time to comply with the CPP. The table below highlights examples of utilities that have rapidly expanded their use of wind energy through both direct ownership and Power Purchase Agreements.[45]

Wind capacity or output purchased by utility, as a share of utility's total owned capacity	2009	2010	2011	2012	2013	2014	2015
Alabama Power	0.0%	0.0%	0.0%	1.6%	3.3%	3.3%	3.3%
Consumers Energy	0.9%	0.9%	2.2%	5.4%	5.4%	6.7%	6.7%
Idaho Power	7.7%	11.0%	18.4%	25.6%	25.6%	25.6%	25.6%
Interstate Power and Light	14.6%	14.6%	14.8%	15.4%	15.4%	15.4%	15.4%
MidAmerican Energy	14.4%	14.4%	20.5%	24.7%	25.2%	30.5%	30.7%
Northern States Power Minnesota	11.6%	14.3%	16.3%	19.1%	19.1%	19.1%	19.1%
Oklahoma Gas & Electric	2.5%	4.3%	5.8%	9.2%	9.2%	9.2%	9.2%
PacifiCorp	10.9%	13.3%	13.6%	14.6%	14.6%	14.6%	14.6%
Portland General Electric	10.4%	15.5%	15.5%	15.5%	15.5%	22.9%	22.9%
Public Service Co of Colorado	18.4%	18.4%	25.6%	32.0%	32.0%	35.2%	35.2%
Public Service Co of Oklahoma	11.2%	13.1%	13.1%	13.1%	13.1%	16.9%	20.7%
Puget Sound Energy	16.1%	16.1%	16.1%	27.7%	27.7%	27.7%	27.7%
Southwestern Electric Power Company	1.3%	1.3%	1.3%	6.5%	6.5%	6.5%	6.5%
Southwestern Public Service	12.9%	13.3%	13.5%	18.2%	18.2%	27.8%	28.3%
DTE Electric Company (Detroit)	0.2%	0.3%	1.1%	4.2%	5.7%	7.5%	7.5%
Westar Energy	6.3%	6.3%	6.3%	12.5%	12.5%	12.5%	12.5%
Wisconsin Power & Light	4.9%	4.9%	9.5%	9.5%	9.5%	9.5%	9.5%

53. Notable examples include the three Xcel Energy companies: Northern States

[45] AWEA Market Database Pro.

Power Minnesota, Public Service Company of Colorado, and Southwestern Public Service. Each Xcel utility has quickly ramped up its use of wind energy, primarily through the use of PPAs, so that owned and contracted wind capacity now accounts for between 19.1 percent and 35.2 percent of its total utility-owned installed capacity of all generation resources. Xcel's example also illustrates that wind energy can be quickly added under different regulatory and market systems, as Public Service Company of Colorado is a vertically-integrated utility while Xcel's other two utilities are part of interstate wholesale power markets operated by Independent System Operators ("ISOs").

54. Alabama Power is another noteworthy example, as the vertically-integrated utility was able to quickly ramp up its use of wind energy by purchasing the output of wind projects located several states away. These purchases allowed Alabama Power to rapidly grow from zero wind energy in 2011 to 1.6% wind capacity in 2012 and 3.3% wind capacity in 2013. The Tennessee Valley Authority, Georgia Power, Florida's Gulf Power, and a number of California utilities have similarly used large interstate wind purchases.

55. Other utilities in the table demonstrate that utilities can quickly ramp up wind energy use through direct ownership of wind projects. For example, MidAmerican Energy in Iowa has primarily used direct ownership to increase its wind use to more than 30 percent of its installed capacity. Over the last five years, Consumers Energy and DTE Electric Company in Michigan have both used direct ownership to quickly scale up their wind capacity from almost nothing to around 7 percent of their total installed generating capacity.

56. Specific states also stand out for the rapid rate at which they have been able to expand their use of wind energy. In addition to the Alabama, Idaho, Iowa, Minnesota, Oregon, Colorado, Washington, Oklahoma, and Wisconsin examples in the table above, Texas has rapidly increased its use of wind energy. Texas ramped up from 1,290 MW of wind capacity in 2004 to 10,000 MW in 2010.[46] The state currently has 16,406 MW[47] of installed wind capacity and an additional 6,300 MW under construction that is expected to be completed within the next year and half. ERCOT, the main grid operator in Texas, received 10.6 percent of its electricity from wind energy in 2014,[48] and that figure is expected to grow significantly over the next two years as new wind capacity comes online.

Transmission is not a limiting factor for CPP compliance

57. Some Petitioners' declarations claim that the lead time to build transmission requires immediate action, and cost, to begin planning transmission that will be needed for CPP compliance. This claim is incorrect for the following reasons that are explained in more detail in this section. First, a large amount of new transmission that will support the generation changes associated with the CPP, including both reduced coal generation and the addition of natural gas generation and zero-carbon generation, is already under construction or in advanced stages

[46] DOE, Wind Installed Capacity, *available at* http://apps2.eere.energy.gov/wind/windexchange/wind_installed_capacity.asp.

[47] AWEA, Third Quarter Market Report 2015, *available at* http://awea.files.cms-plus.com/FileDownloads/pdfs/3Q2015%20AWEA%20Market%20Report%20Public%20Version.pdf

[48] ERCOT, 2014 total energy use in ERCOT region up by 2.5 percent from 2013, *available at* http://www.ercot.com/news/press_releases/show/51654.

of development, including receiving the permits needed to proceed. Second, many transmission system upgrades do not require new right-of-way and therefore can be completed relatively quickly. Third, while transmission expansion is important for the most cost-effective compliance with the CPP in the long-term, it is not essential in the near-term because sufficient resources can be deployed to comply with the CPP interim targets without new transmission in place. Regardless, all regions are already required to conduct transmission planning exercises to identify needed grid upgrades, and virtually all transmission costs are associated with permitting and construction for specific projects and not general transmission planning, so incorporating CPP demand into transmission planning that is already happening should result in little to no incremental cost. Moreover, well-planned transmission upgrades more than pay for themselves by providing a large range of consumer and reliability benefits, so there is no downside risk to planning transmission that will still provide net benefits under any policy outcome.

58. Many near-term transmission projects that will support the generation changes associated with the CPP are already well underway. As a result, Petitioners' claims that they will not be able comply with the CPP unless they immediately invest in planning and permitting additional transmission infrastructure are incorrect.

59. The Edison Electric Institute ("EEI") compiles a detailed list[49] of transmission

[49] EEI, Transmission Projects at a Glance, *available at* http://www.eei.org/issuesandpolicy/transmission/pages/transmissionprojectsat.aspx.

projects that are being developed by its membership of investor-owned utilities. EEI's 2015 report found that its members plan to invest at least $47.9 billion in 170 specific transmission projects through 2025. These projects are geographically spread across the entire country, and most will at least in part address economic and reliability needs associated with the changing generation mix. Much of this transmission investment will be front-loaded in near-term projects that are already under construction or have received all necessary permits; EEI's report notes that only "$10.5 billion of the reported $47.9 billion are projects in the conceptual or initial planning phase or subject to approval in regional planning processes." EEI's report also projects that its members will spend at least $19 billion on transmission in each of 2015, 2016, and 2017, indicating these projects are currently under construction or in very advanced development and will be available to facilitate CPP compliance. Confirming that most of these transmission projects that are being developed anyway will also facilitate the changes in the generation mix associated with CPP compliance, EEI notes that 46% of the projects identified in its report will at least in part support the interconnection of renewable resources.

60. EEI's report only includes transmission lines that are being developed by its membership of investor-owned utilities, so the total amount of transmission investment in the U.S. is even larger than indicated by EEI's figures. A number of additional transmission projects under construction or in advanced development by publicly owned utilities or private transmission developers are not included in EEI's figures. For example, various transmission projects being built by the

Bonneville Power Administration, such as the Big Eddy – Knight and Central Ferry – Lower Monumental transmission lines, are not included in EEI's list and therefore are additional to the investment figures cited above.

61. Similarly, many large transmission lines that have been proposed by independent transmission developers to deliver renewable energy across long distances are not included in EEI's list. This includes four high-voltage direct current (HVDC) transmission lines and one alternating current line being developed by Clean Line Energy Partners, Power Company of Wyoming's proposed TransWest Express HVDC line, Pattern Energy's Southern Cross HVDC transmission line, and other similar lines. Each of these proposed HVDC lines can deliver 3,000 MW or more of high-quality renewable resources to regions with significant electricity demand. Nearly all have expected in-service dates well before CPP compliance begins, and most are in advanced stages of obtaining the necessary permits.

62. NERC's 2014 Long-term Reliability Assessment similarly identified "7,400 circuit miles of lines currently under construction, 20,622 circuit miles of planned lines, and 7,360 miles of conceptual lines" planned for the next 10 years.[50]

63. AWEA has also identified many near-term transmission projects that can support a large build out of additional wind capacity, as indicated in the table below that was compiled in early 2015.[51] Many of these transmission projects are currently

[50] NERC, 2014 Long-Term Reliability Assessment, at 31, *available at* http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf.

[51] AWEA Annual Market Report (2015), *available at* http://www.awea.org/marketreports.

under construction or have received all necessary permits, including nearly all of MISO's Multi-Value Projects,[52] which alone are expected to enable 43 million MWh of additional wind supply across the MISO footprint, the approximate output of 14,000 MW of new wind capacity.[53]

Transmission Project Name (State)	**Voltage (kilovolts, kV)**	**Estimated In-service Date**	**Estimated Potential Wind Capacity, MW**
Big Eddy – Knight and Central Ferry – Lower Monumental (OR, WA)	500	2015	4,700
Tehachapi Phases 2-3 (CA)	500	2015-2016	3,800
Maine Power Reliability Program	345, 115	2015-2017	?
Valliant - NW Texarkana (TX; SPP Priority Project)	345	2015	(SPP Priority Project Component)
Lower Rio Grande Valley (TX)	345	2016	?
Southline Transmission Project (NM, AZ)	345, 230	2016	1,000
MISO Multi-Value Projects (ND, SD, IA, MN, WI, IL, MO, MI)	345, one 765 line	2015-2020	14,000
Transwest Express (WY)	600 DC	2017	3,000
Grand Prairie Gateway (IL)	345	2017	1,000
Nebraska City - Mullin Creek - Sibley (NE-MO; SPP Priority Project)	345	2017	(SPP Priority Project Component)
Colstrip Upgrade Project (MT)	500	2018	480
Clean Line Projects (KS, OK, TX, NM, IA)	600 DC	2018-2020	15,500
Pawnee - Daniels Park (CO)	345	2019-2020	500
Gateway West (WY, ID)	500	2019-2021	3,000
Sunzia (NM, AZ)	500	2020	3,000

[52] MISO, Multi-Value Project Status as of July 2015, *available at* https://www.misoenergy.org/Library/Repository/Study/MTEP/MVP%20Portfolio%20Triennial%20Review/MVP%20Dashboard.pdf.

[53] MISO, MTEP14 MVP Triennial Review, at 2, *available at* https://www.misoenergy.org/Library/Repository/Study/Candidate%20MVP%20Analysis/MTEP14%20MVP%20Triennial%20Review%20Report.pdf.

Gateway South (WY, UT)	500	2020-2022	1,500
Boardman-Hemingway (OR, ID)	500	2020	1,000
SPP 2012 ITP10 Projects (TX, OK, KS, MO)	345	2018-2022	3,500
Total Potential New Transmission Capacity			**55-60 GW**

64. While most of the transmission projects discussed above involve building new transmission lines on new right-of-way, other types of transmission system upgrades that also facilitate changes to the generation mix but do not require new right-of-way can be completed with shorter lead times. Examples of solutions that can significantly increase power transfer on existing rights-of-way include upgrading substation equipment to higher capacity,[54] re-conductoring existing transmission paths with advanced materials,[55] adding second circuits to existing transmission towers,[56] rebuilding existing transmission paths with new towers and conductors,[57] and installing series compensation,[58] synchronous condensers, or Flexible AC Transmission devices[59] to improve power flow on

[54] *See, e.g.,* PJM, RTEP Upgrades Status, *available at* http://www.pjm.com/planning/rtep-upgrades-status/construct-status.aspx.

[55] EPRI, Demonstration of Advanced Conductors for Overhead Transmission Lines, *available at* http://www.energy.ca.gov/2013publications/CEC-500-2013-030/CEC-500-2013-030.pdf.

[56]ERCOT, Panhandle Renewable Energy Zone Study Report, *available at* http://www.ercot.com/content/news/presentations/2014/Panhandle%20Renewable%20Energy%20Zone%20Study%20Report.pdf.

[57] Bold, Projects, *available at* http://www.boldtransmission.com/projects/.

[58] PSC, Review of Series Compensation for Transmission Lines, *available at* http://www.spp.org/documents/22902/17_ju4715%20-%20spp%20-%20review%20of%20series%20compensation%20-%20final%20-%202.1.pdf

[59] GridTechEU, Flexible AC Transmission System, *available at* http://www.gridtech.eu/project-scope/technologies/12-technologies/21-facts-flexible-alternating-current-transmission-system.

existing lines. Because these upgrades do not involve the acquisition of new right-of-way, they typically do not require a lengthy permitting process if any and therefore can typically be completed in a short timeframe. There may also be significant potential to use existing transmission capacity that is being opened up due to changes in the generation mix to deliver low or zero-carbon generation.

65. In many cases utilities could even complete new transmission development on new right-of-way in time to meet CPP compliance obligations, even without beginning transmission development or incurring costs while litigation over the CPP is resolved. For example, the Arkansas Public Service Commission Declarant Thomas states that it takes 5-7 years to permit and build new transmission.[60] This timeframe allows meeting 2022-2024 CPP requirements with new transmission, and certainly later CPP needs, even without incurring incremental transmission planning or development costs in the near future. This timeline is assisted by the fact that in some regions transmission planning that includes the CPP is already underway as part of routine transmission planning exercises, as explained below.

66. In Texas, most of the Competitive Renewable Energy Zone (CREZ) transmission lines were placed into service towards the end of 2013, about 5.5 years after the initial CREZ planning report was released by ERCOT in the

[60] Thomas Decl. ¶ 10.

spring of 2008,[61] and many CREZ line segments were completed before that. The CREZ projects were quite large, at $6.9 billion and 3,600 miles built almost entirely on new right-of-way, so smaller projects would likely have a significantly shorter timeline. Public Utility Commission of Texas declarant Lloyd claims that the CREZ process took nine years;[62] however, he starts from the date legislation was passed authorizing CREZ in 2005. In many regions that authority already exists and is being used to conduct transmission planning of the type that did not begin in earnest in Texas until around 2007,[63] so the timeline that would be most comparable to the current starting point for many regions would be around 6 years from the start of planning to transmission project completion.

67. Even without beginning transmission development in the next several years, new transmission can certainly be ready in time to meet CPP obligations in the latter half of the 2020s. While transmission expansion is important for the most cost-effective CPP compliance, it is not essential – particularly in the early years of CPP compliance. As explained above, the 2022-2024 CPP targets are sufficiently achievable that – while it would not be cost-effective – they could be met entirely without new-transmission-enabled renewable energy by instead making use of less productive renewable resources, ramping up existing gas generation, implementing fossil unit heat rate improvements, and deploying end use energy

[61] ERCOT, Competitive Renewable Energy Zone Planning report, *available at* http://www.ercot.com/content/meetings/board/keydocs/2008/B0415/Item_6_-_Competitive Renewable Energy Zone_Transmission_Report_to_PUC_-_Woodfin_Bojorquez.pdf.

[62] Lloyd Decl. ¶ 76.

[63] Oncor, CREZ update, *available at* http://www.texasre.org/CPDL/CREZ.pdf.

efficiency. In fact, EPA's Integrated Planning Model analysis assumes that no new transmission capacity is available and is still able to achieve compliance with the CPP;[64] however, that compliance strategy is likely to be significantly higher-cost than one that uses transmission to access higher-quality low-carbon resources.

68. Even if transmission upgrades will not be complete by 2022, wind developers and utilities have demonstrated the ability to bring wind plants online in advance of full completion of transmission upgrades by accepting some level of wind curtailment for a short period of time. Specifically, DOE data on historical wind curtailment in ERCOT and current wind curtailment in MISO curtailment show wind projects can accept significant curtailment for a short period of time until transmission expansion is complete.[65]

69. In some cases new renewable energy can also be deployed without new transmission. This is particularly true given advances in wind turbine towers and blades that make lower wind speed sites economically viable and provide more flexibility for expanding wind use without large transmission needs.

70. Longer turbine blades increase wind turbine productivity and also provide access to higher wind speeds farther above the earth's surface, making more wind sites economically viable. This can be particularly beneficial for opening up wind

[64] EPA, Analysis of the Clean Power Plan, *available at* http://www2.epa.gov/airmarkets/analysis-clean-power-plan.

[65] DOE, 2014 Wind Technologies Market Report, at Fig. 31, *available at* https://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.

resource areas that were not previously thought to have economically viable wind resources but do have access to transmission capacity or are in close proximity to electricity demand centers. The DOE/LBNL 2014 Wind Technologies Market Report documents how the average turbine blade diameter has increased from around 80 meters in 2008 to nearly 100 meters today.[66] Because the area swept by the turbine blades and therefore the wind energy capture potential is proportional to pi*r^2, this corresponds to a more than 50% increase in swept area and energy capture. The increase in energy capture can be even greater because the longer blades typically reach higher wind speeds farther above the earth's surface.

71. Taller turbine towers are also already providing access to stronger winds farther above the earth's surface, particularly in more populated regions where there tends to be greater access to available transmission capacity. While the sparsely-populated Interior region of the U.S. continues to primarily use 80 meter turbine towers, in the more densely populated Eastern U.S. turbine towers in excess of 100 meters are now widely used. Taller towers are widely used in the East because most parts of the Eastern U.S. have relatively high wind shear, defined as the difference between wind speeds closer to the ground versus higher aloft, versus low wind shear in the Interior region. Towers of 100 meters or greater height account for the majority of recent installations in the Eastern U.S., with 90-100 meter towers making up a large share of the remainder.[67]

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[66] DOE, 2014 Wind Technologies Market Report, at Fig. 20, *available at* http://emp.lbl.gov/sites/all/files/lbnl-188167.pdf.

[67] *Id.* at Fig. 27.

72. As noted by updated wind resource maps released by NREL and the DOE, these advances are opening up large new areas for economic wind development, making all regions of the U.S. viable for wind energy development.[68] As a real-world example of these technological advances opening up new areas for economic wind development, Iberdrola and Amazon recently announced they have started construction on a 208 MW wind project in eastern North Carolina, the first utility-scale wind project in the state and the largest in the Southeast by far. The turbines used at that project will use 114 meter diameter rotors and other technologies to maximize energy production.

73. The National Renewable Energy Laboratory (NREL) has quantified[69] how these technological advances have increased the economically viable wind resources in each state. In many highly populated states the viable wind resource potential has increased by several orders of magnitude, and NREL projects further increases from continued technological advances. The expansion of the viable wind resource from these technological advances is particularly large in more populous states with large electricity demand and little prior wind development. As a result of their large electricity demand and lack of prior wind development, these regions can reasonably be expected to have greater potential for adding new wind

[68] See 110 meter and 140 meter wind resource maps in DOE, Enabling Wind Power Nationwide, *available at* http://energy.gov/sites/prod/files/2015/05/f22/Enabling-Wind-Power-Nationwide_18MAY2015_FINAL.pdf, and Mapping the Frontier of New Wind Power Potential, *available at* http://energy.gov/eere/articles/mapping-frontier-new-wind-power-potential.

[69] NREL, Estimates of Wind Energy Potential by States, *available at* http://apps2.eere.energy.gov/wind/windexchange/docs/wind_potential_80m_110m_140m_35percent.xlsx.

capacity to their existing transmission infrastructure.

74. Regardless, the claim made by the Petitioners' declarants that the CPP will cause them to incur significant transmission planning costs in the near-term is without merit because there is little to no incremental cost associated with transmission planning for the CPP. Regional and inter-regional transmission planning is already conducted in all regions; in fact, this planning is legally required under FERC Order 1000.[70] Incorporating the expected impact of the CPP into transmission planning that is already happening should not result in any significant incremental cost. Several grid operators have already incorporated the CPP into their routine multi-year transmission planning processes, including SPP, MISO, and PJM, and they do not appear to have noticeably increased their spending on transmission planning.

75. The largest components of transmission planning expenses are typically compiling the starting information to characterize the existing power system in the power system model, buying licenses for the software to run the analysis, buying computing hardware, and paying the staffers who compile the existing power system information to run the analysis. All of those are fixed costs that will be incurred regardless of how many transmission planning scenarios are run, so the incremental cost of running additional transmission planning scenarios related to the CPP should be minimal to nonexistent. The most likely outcome in most transmission planning processes is that CPP scenarios will simply replace other

[70] FERC, Order No. 1000 - Transmission Planning and Cost Allocation, *available at* http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp.

transmission planning scenarios that would have been run, so there should be approximately zero incremental cost.

76. Almost all total transmission costs are associated with permitting, land acquisition, and construction work for specific transmission projects, and not general early stage transmission planning. The vast majority of transmission costs are not incurred until transmission construction begins, which only takes place in the last year or two of the transmission development process.

77. Only about 2 percent of total transmission project costs are spent on all development activities, and of those development costs the vast majority would not be spent until much later in the development process, after initial transmission planning studies. David Berry with Clean Line Energy testified in Missouri that "We estimate that of the total cost of a transmission project, such as the Grain Belt Express Project, approximately 2% is spent in development activities (obtaining siting authority, interconnection studies, routing, permitting, and public outreach), approximately 10% is spent in pre-construction activities (order the DC converters, acquiring rights-of-way), and the remaining approximately 88% is spent in construction and commissioning activities."[71] Of that 2 percent of costs related to development work, expensive components like detailed routing and engineering studies, public outreach, and legal and regulatory work comes later in the development process and would not be required during

[71] Direct Testimony of David Berry, *available at* https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=EA-2014-0207&attach_id=2014014813, page 41.

any CPP-related transmission planning that would be conducted over the next several years.

78. Moreover, well-planned transmission upgrades more than pay for themselves by providing a large range of consumer and reliability benefits, so there is no downside risk to planning transmission that will still provide net benefits under any policy outcome.

79. The Mid-Continent Independent System Operator (MISO),[72] Southwest Power Pool (SPP),[73] and other experts[74] have documented that transmission upgrades provide many types of benefits that greatly exceed the cost of transmission. SPP found a benefit-to-cost ratio of around 2:1 for major transmission upgrades in its region, while MISO found a benefit-to-cost ratio of between 2.6:1 and 3.9:1 for its Multi-Value Projects.

80. Transmission is also an important mechanism to protect consumers against the inherent but unpredictable volatility in the price of fuels used to produce electricity. Transmission can alleviate the negative impact of fuel price fluctuations on consumers by making it possible to buy power from other

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[72] MISO, MTEP14 MVP Triennial Review, *available at* https://www.misoenergy.org/Library/Repository/Study/Candidate%20MVP%20Analysis/MTEP14%20MVP%20Triennial%20Review%20Report.pdf.

[73] SPP, Benefits of a Robust Transmission Grid, *available at* http://www.spp.org/documents/10047/benefits_of_robust_transmission_grid.pdf.

[74] Brattle, The Benefits of Electric Transmission, *available at* http://www.brattle.com/system/news/pdfs/000/000/020/original/The_Benefits_of_Electric_Transmission_-_Identifying_and_Analyzing_the_Value_of_Investments_Chang_Pfeifenberger_Hagerty_Jul_2013.pdf?1377791283.

generators and regions and move it efficiently on the grid. This increased flexibility helps to modulate swings in fuel price, as it makes demand for fuels more responsive to price as utilities are able to respond to price signals by decreasing use an expensive fuel and instead importing cheaper power produced from other sources.

81. Transmission infrastructure is also a powerful tool for increasing competition in wholesale power markets and reducing the potential for generators to harm consumers by exercising market power. In Order 890, the Federal Energy Regulatory Commission (FERC) explained how transmission constraints can restrict electricity market competition, discussing how those with incumbent generating assets "can have a disincentive to remedy transmission congestion when doing so reduces the value of their generation or otherwise stimulates new entry or greater competition in their area. For example, a transmission provider does not have an incentive to relieve local congestion that restricts the output of a competing merchant generator if doing so will make the transmission provider's own generation less competitive."[75] Texas's longstanding policy of broadly allocating transmission costs is heavily based on their understanding of the essential role transmission plays in maintaining a competitive wholesale market for electricity.

82. Transmission upgrades also provide significant value by improving electric reliability, though it is often difficult to quantify that benefit. Reducing congestion

[75] FERC, Order 890, *available at* http://www.nerc.com/files/order_890.pdf.

and providing greater redundancy in transmission paths inherently improves electric reliability and makes the power system more resilient to unexpected generator and transmission outages. Texas has real-world experience with the multi-faceted net benefits of transmission upgrades. ERCOT, the Texas grid operator, has documented how grid upgrades primarily designed to accommodate new wind energy have had the unexpected benefit of addressing reliability concerns caused by the potential retirement of fossil generators.[76] Former Public Utilities Commission of Texas Chair Barry Smitherman has explained how those grid upgrades also unexpectedly addressed reliability concerns caused by the increased electricity demand from oil and gas drilling in West Texas.[77] Because transmission upgrades more than pay for themselves by providing a large range of consumer and reliability benefits, there is no downside risk to planning transmission that will provide net benefits under any policy outcome.

Electric reliability is not a concern and will not cause near-term costs for states and utilities

83. Some Petitioners' declarants also incorrectly allege that generation changes caused by the CPP could trigger electric reliability concerns and generator retirements that will cause them to devote additional resources to reliability planning and analysis in the next year or two. This claim is false for the following reasons that

[76] ERCOT, Long-Term System Assessment, at 33-35, *available at* http://www.ercot.com/content/news/presentations/2013/2012%20Long%20Term%20System%20Assessment.pdf.

[77] Texas Energy Report (subscription), *referenced here* http://www.quorumreport.com/Quorum_Report_Daily_Buzz_2014/texas_energy_report_smitherman_chafes_at_comptroll_buzziid22608.html.

will be explained in more detail in this section.

84. First, electric reliability analysis is already conducted anyway by the North American Electric Reliability Corporation (NERC), NERC's regional entities,[78] independent system operators, and others. Incorporating CPP-related changes to the generation mix into reliability analyses that will be conducted anyway should not impose a significant incremental cost, particularly in the near-term. Regardless, in most cases the states and utilities who submitted declarations claiming they will face reliability analysis cost are not the entities who actually bear those costs. Interconnecting generators typically pay the full cost of conducting reliability studies that determine if they can be reliably connected to the power system. Moreover, in many regions market mechanisms drive decisions to add new generating capacity, so there is no need for additional planning resources to assess resource adequacy concerns.

85. More importantly, expanded use of wind energy will not harm electric reliability, contrary to several erroneous claims made by Petitioners' declarants that are based on an outdated understanding of power system operations and the technical capabilities of modern wind turbines. Many utilities and grid operators already reliably obtain a large share of their electricity from wind energy, and comprehensive studies indicate far more wind energy than is needed for CPP compliance can be integrated without any reliability concerns. These studies and operating experience have shown that wind energy's impact on the total power

[78] NERC, Regional Entities, *available at* http://www.nerc.com/AboutNERC/keyplayers/Pages/Regional-Entities.aspx.

system need for flexible operating reserves is far smaller than that caused by the abrupt failures of large conventional power plants. Thanks to technological advances, modern wind plants are now capable of providing all reliability services provided by conventional power plants, and in many cases wind plants provide these reliability services better than conventional power plants.

86. Nothing in the CPP requires coal power plants to retire, and any decisions about coal plant retirements need not be made for at least several more years, so there is no merit to declarants' claims about near-term cost and reliability concerns related to coal plant retirements. Several studies have demonstrated that using wind energy for CPP compliance tends to reduce the likelihood of coal power plants retirements. Wind energy itself does help meet system capacity needs, and never harms them. Decisions about steps to address potential reliability concerns, including demand response, energy efficiency, generation and transmission additions, and even a decision not to retire an existing generator, need not be made for several more years at least. As a result, there is no need for a stay of the CPP as there will be no near-term costs or reliability concerns associated with the CPP.

87. Turning to a more detailed explanation of these points, electric reliability analysis and planning is already extensively conducted by a number of entities, and incorporating CPP planning into planning exercises that are conducted anyway should not impose any incremental cost in the near-term. NERC and regional reliability entities already conduct extensive planning to assess reliability concerns,

releasing annual[79] and seasonal[80] reliability reports. Regional Independent System Operators/Regional Transmission Organizations (ISOs/RTOs) also conduct extensive planning exercises, and outside of ISO/RTO areas regional reliability entities like the Western Electric Coordinating Council and Peak Reliability, SERC, and FRCC fulfill that role. Incorporating CPP planning into planning exercises that are being conducted anyway should result in little to no incremental cost.

88. Typically, interconnecting generators pay the full cost of studies to assess whether they can be reliably interconnected to the power system, and they also typically bear the cost of any local grid upgrades that are needed to reliably accommodate their interconnection.[81] As explained above, for new wind energy additions these costs are almost always incurred by private generation developers, with no cost obligation on the utility until an agreement to purchase a wind project or its output has been signed. In addition, a large amount of planned new generation has already successfully passed the interconnection study process, so in many cases no new additional cost must be incurred and projects could quickly proceed

[79] NERC, Long-Term Reliability Assessment, *available at* http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf.

[80] NERC, 2015 Summer Reliability Assessment, *available at* http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015_Summer_Reliability_Assessment.pdf.

[81] *See, e.g.,* CAISO, Generator Interconnection Application Process, *available at* https://www.caiso.com/planning/Pages/GeneratorInterconnection/GeneratorInterconnectionApplicationProcess/Default.aspx; PJM, Generator Interconnection, *available at* http://www.pjm.com/planning/generation-interconnection.aspx.

to construction.

89. In many regions market mechanisms drive decisions to add new generating capacity, so there is no need for additional planning resources to assess resource adequacy concerns, particularly in the near-term. Several ISOs, such as PJM, New York, New England, and MISO[82] use capacity markets to meet system needs for generating capacity, essentially placing the obligation for generation planning on those who would like to build new capacity resources. Moreover, most capacity markets only look three years into the future, so the cost of planning for the 2022 time period when CPP compliance begins will not be incurred until several years from now, rebutting declarants' stated concerns that reliability planning will impose near-term costs.

90. Concerns expressed by several Petitioners' declarants about the reliable integration of renewable energy are contradicted by utilities' real-world experience with reliably integrating large amounts of wind energy.[83] As documented by the Table in the previous section, many utilities have rapidly expanded their use of wind energy and experienced no reliability concerns. In 2014, wind energy provided more than 15 percent of electricity in a total of seven states, more than 10 percent in a total of nine states, and more than five percent in a total of 19

[82] MISO, Auction Results, *available at* https://www.misoenergy.org/Library/Repository/Report/Resource%20Adequacy/AuctionResults/2015-2016%20PRA%20Results.pdf.

[83] For citations to additional sources, see AWEA, Wind Energy Helps Build a More Reliable and Balanced Electricity Portfolio, *available at* http://awea.files.cms-plus.com/AWEA%20Reliability%20White%20Paper%20-%202-12-15.pdf.

states. Iowa led the nation by producing 28.5 percent of its electricity from wind power, followed by South Dakota at 25.3 percent and Kansas at 21.7. At times, wind has supplied more than 61 percent of the electricity on the main utility system in Colorado, and over 40 percent on the main Texas power system.

91. Individual grid operators, or Balancing Authorities, have reliably integrated high levels of renewable energy use. Xcel Energy's Public Service Company of Colorado, which operates its own Balancing Authority, obtains around 20 percent of its electricity from wind and solar energy. ERCOT, the grid operator for most of Texas, obtained 10.6 percent of its electricity from wind energy last year. The Southwest Power Pool, the grid operator for Kansas, Oklahoma, Nebraska, and parts of neighboring states, obtained 12 percent of its electricity from wind energy last year.[84]

92. Other countries have demonstrated that far higher amounts of wind energy can be reliably integrated under less favorable grid operating conditions than those in the U.S. Ireland, Spain, and Portugal obtain 20-26% of their electricity from wind on an annual basis, and Denmark is at nearly 39%.[85] Germany, the U.K., and Romania all obtain 10-15% of their electricity from wind. Including solar and other renewable energy sources, Germany, Spain, and Portugal obtain over 25% of their electricity from non-hydro renewable resources. Wind energy leaders

[84] SPP, State of the Market Report, at 42 *available at* http://www.spp.org/documents/29399/2014%20state%20of%20the%20market%20report.pdf.

[85] DOE, 2014 Wind Technologies Market Report, at Fig. 4, *available at* https://emp.lbl.gov/publications/2014-wind-technologies-ma.

Denmark, Ireland, Spain, and the Netherlands all have some of the most reliable power systems in the world, and they have seen their reliability improve significantly as they have increased their use of wind energy.[86]

93. Reliably and cost-effectively integrating large amounts of renewable energy will be even easier in the U.S., as American renewable resources are more diverse and produce more energy more consistently. The U.S. power system is larger and more flexible than that in most of Europe, with abundant hydroelectric resources, flexible gas generation, and more weather-driven electricity demand variability that, as explained below, cancels out much of the variability of renewable energy. In contrast, Ireland and the U.K. are essentially electrical islands with minimal transmission ties and an inflexible generation fleet, and Spain and Portugal have similarly succeeded with minimal transmission ties to neighbors.

94. All studies by utilities, grid operators, and other experts confirm that the U.S. can reliably obtain a much higher share of its electricity from wind and solar energy.[87] Several U.S. studies have looked at very high renewable use levels and found wind and solar can reliably provide between 24 and 50 percent of electricity, with many studies taking a comprehensive look at all grid services needed to maintain electric reliability.[88]

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[86] James Ayre, German Grid Reaches Record Reliability in 2011 Thanks to Renewables, *available at* http://cleantechnica.com/2012/09/12/german-grid-reaches-record-reliability-in-2011-thanks-to-renewables/.

[87] UVIG, Variable Generation Integration Library, *available at* http://uvig.org/resources/.

[88] NREL, Relevant Studies for NERC's Analysis of EPA's Clean Power Plan 111(d) Compliance, *available at* http://www.nrel.gov/docs/fy15osti/63979.pdf.

95. A key reason grid operators are able to reliably integrate large amounts of wind energy is that changes in wind energy output occur gradually and can be forecast, unlike other changes in electricity supply and demand on the power system. Because wind turbines are spread across a large geographic area, it typically takes many hours for a weather event to affect a large share of a region's wind output, as confirmed by wind plant operating data from ERCOT.[89] In addition, most changes in wind energy output are canceled out by opposite changes total power system variability, caused by the constant fluctuations in electricity demand and conventional power plants deviating from their expected output levels. This allows grid operators to reliably integrate large amounts of wind energy by modestly increasing the amount of slower-acting flexible operating reserves beyond what they already hold to accommodate fluctuations in electricity supply and demand.[90]

96. In contrast, large conventional power plants occasionally experience sudden outages that can take several thousand MWs offline in a fraction of a second. Because these outages can occur instantly and without warning, large quantities of fast-acting operating reserves must be maintained at all times. Importantly, the cost of flexible operating reserves to accommodate slower changes in power

[89] NREL, Analysis of Wind Power Ramping Behavior in ERCOT, *available at* http://www.nrel.gov/docs/fy11osti/49218.pdf.

[90] *See, e.g.,* EnerNex Corporation, Final Report - 2006 Minnesota Wind Integration Study, *available at* http://www.uwig.org/windrpt_vol%201.pdf; PJM, Renewable Integration Study, *available at* http://www.pjm.com/~/media/committees-groups/subcommittees/irs/postings/pjm-pris-task-3a-part-b-statistical-analysis-and-reserves.ashx.

system variability is typically a fraction of the cost of faster-acting reserves. As a result, the cost of reliably integrating wind energy is a fraction of the cost of integrating large conventional power plants, as documented by ERCOT's own analysis of operating reserve needs and data on ERCOT operating reserve prices.[91]

97. Recent analysis by the National Renewable Energy Laboratory ("NREL") similarly found that inflexible "baseload" conventional generation imposes a larger increase in operating costs on other generators than the addition of an equivalent amount of wind generation.[92] Other NREL analysis shows that adding wind generation actually tends to reduce total power system operating reserve costs by freeing up conventional generators to provide greater quantities of operating reserves.[93] As a result, in NREL's analysis of the Colorado and Wyoming power systems, total operating reserve costs actually fell from $32.3 million at a 25% renewable penetration to $31.2 million at a 35% renewable penetration, even though the quantity of operating reserves increased.

98. Despite this data, several Petitioners' declarations fall into common misconceptions about the impact of wind energy on the power system. The

[91] AWEA, Wind's Integration Costs Are Lower Than Those For Other Energy Sources, *available at* http://www.aweablog.org/fact-check-winds-integration-costs-are-lower-than-those-for-other-energy-sources/.

[92] NREL, A Systematic Approach to Better Understanding Integration Costs, *available at* http://www.nrel.gov/docs/fy15osti/64502.pdf.

[93] NREL, Fundamental Drivers of the Cost and Price of Operating Reserves, *available at* http://www.nrel.gov/docs/fy13osti/58491.pdf, page 31.

Public Utility Commission of Texas declarant writes that "Finally, assumptions about the ability of power markets to reliably incorporate large amounts of incremental renewable energy fail to recognize the operational modifications that must result in such markets and, within the ERCOT power market, the existing substantial penetration of these technologies and the unique reliability issues that already exist in the ERCOT power region at the current levels of renewable energy that are unprecedented elsewhere in the country. ERCOT, Inc. has already found a need to procure additional "ancillary services" or back-up fossil fueled capacity in order to reliably integrate the large amounts of wind generation that has connected to the ERCOT power grid."[94]

99. ERCOT's own analysis,[95] discussed above, shows that the impact of a large amount of wind generation on its need for operating reserves has been trivially small. Subsequent ERCOT analysis confirms that the impact of wind on its need for operating reserves has been very small, even smaller than predicted by a 2008 wind integration study.[96] MISO has also explained that the impact of more than 12,000 MW of wind generation on its need for fast-acting operating reserves has

[94] Lloyd Decl. ¶¶ 65-68.

[95] Maggio, Methodology for Calculating Reserves in the ERCOT Market 2012, *available at* http://www.uvig.org/wp-content/uploads/2012/12/Maggio-Reserve_Calculation_Methodology_Discussion.pdf.

[96] GE Wind Study, Analysis of Wind Generation Impact on ERCOT Ancillary Services Requirements, *available at* http://www.ercot.com/content/meetings/qmwg/keydocs/2013/1007/GEStudyAnalysis_ERCOTInternalReport.pdf.

been "little to none."[97] Several declarants whose power systems are part of MISO claim they would face challenges reliably integrating greater amounts of wind energy.[98] One problem with this claim is that MISO operates their power systems for them, so they do not need to integrate wind energy themselves. All sources of variability are aggregated across MISO, and resources provided through MISO's energy, ancillary services, and capacity markets meet the aggregate need for these services across the MISO footprint. Moreover, MISO has clearly stated on numerous occasions that it is able to reliably integrate large amounts of wind energy.[99]

100. As another example of a MISO footprint declarant falling into the misconception that renewable generators experience large and fast changes in output and are unique in imposing integration costs on the power system, Public Service Commission of Wisconsin declarant Nowak claims that "Currently, gas plants that can ramp production up and down very quickly and are used to respond to load variances caused by more intermittent renewable energy resources. For example, if the wind dies or the sun is blocked by clouds, natural gas plants are used to quickly ramp up energy production to make up for the production loss from the renewable sources, maintaining a balance of supply and

[97] MISO, Multi-Faceted Solution for Managing Flexibility with High Penetration of Renewable Resources, *available at* http://www.ferc.gov/CalendarFiles/20140411130433-T1-A%20-%20Navid.pdf.

[98] *See, e.g.,* McLennan Decl. ¶ 19.

[99] Wind Output in MISO Surpasses 10GW, *available at* http://www.prnewswire.com/news-releases/wind-output-in-miso-surpasses-10gw-181059021.html.

demand on the electric grid. Other generation types, such as nuclear and coal facilities, are not able to ramp energy production up and down fast enough to respond to the rapid changes resulting from renewable resources….The inability to use the natural gas fleet to respond to these rapid supply-demand changes could result in system overloads, equipment failures, forced shutdown of customer energy supply, and significant reliability concerns."[100] As documented above, changes in wind generation occur gradually and are predictable, causing a very small increase in the system need for operating reserves, particularly fast-acting operating reserves, while in contrast conventional generator outages occur suddenly and without notice. In addition, in many instances coal generators do provide a large share of operating reserves.[101]

101. Other declarants fall for the outdated misconception that wind plants are unable to provide grid reliability services while all conventional generators provide those services, when in reality in many cases the reliability services contributions of wind generators exceed those of conventional generators. For example, PUCT declarant Lloyd states that "Fossil-fueled generation plants often provide services to power grids that intermittent renewable energy sources cannot."[102]

102. However, as summarized in the following table, which compiles analytical

[100] Nowak Decl. at ¶ 14.

[101] NREL, Fundamental Drivers of the Cost and Price of Operating Reserves, *available at* http://www.nrel.gov/docs/fy13osti/58491.pdf.

[102] Lloyd Decl. ¶ 64.

conclusions by NERC staff, NREL, and other experts,[103] wind plants are capable of providing all grid reliability services provided by conventional generators, in many cases exceeding the ability of conventional generators to provide a service. For example, wind plants far exceed the ability of conventional generators to ride-through and remain online during voltage and frequency disturbances on the power system, which is a critical service as the failure of conventional generators to ride-through disturbances has been a significant contributing factor in recent reliability events.[104] In ERCOT and the rest of the country, wind plants meet a significantly more stringent standard for voltage and frequency ride-through than can be met by many conventional power plants. ERCOT requires wind plants to provide reactive power and active power control service at levels comparable to that provided by conventional generation, and FERC recently proposed adopting a similar reactive power requirement for wind in the rest of the nation.[105]

Reliability service	**Wind**	**Conventional generation**
Ride-through	- Excellent voltage and frequency ride-through per FERC Order 661A requirements - Power electronics electrically separate wind turbine generators from grid disturbances, providing them with much greater ability to	- Many cannot match wind's capabilities or meet Order 661A ride-through requirements

[103] See AWEA, Wind Energy Helps Build a More Reliable and Balanced Electricity Portfolio, *available at* http://awea.files.cms-plus.com/AWEA%20Reliability%20White%20Paper%20-%202-12-15.pdf.

[104] RTO Insider, PJM, Pepco Investigating Cause of DC-Area Outage, http://www.rtoinsider.com/pjm-utility-dc-area-outage-14217/.

[105] FERC, Notice of Proposed Rulemaking, *available at* http://ferc.gov/whats-new/comm-meet/2015/111915/E-3.pdf.

	remain online through disturbances	
Reactive and voltage control	- Wind turbine power electronics provide reactive and voltage control equivalent to that of conventional generators[106] - Power electronics can provide reactive power and voltage control even when the wind plant is not producing power[107]	- Provides
Active power control	- Can provide extremely fast response in seconds, far faster than conventional generation[108] - Like other generators, wind will provide this response when it is economic to do so - Xcel Energy sometimes uses its wind plants to provide some or all of its frequency-responsive automatic generation control[109]	- Like wind, many baseload generators do not provide active power control for economic reasons, though they technically can
Frequency response	-Adding wind can help system frequency response by causing conventional generation to be dispatched down[110]	- Changes in conventional generator operating procedures have greatly reduced frequency response[112]

[106] NERC Accommodating High Levels of Variable Generation, at 22, *available at* http://www.nerc.com/files/ivgtf_report_041609.pdf ("As variable resources, such as wind power facilities, constitute a larger proportion of the total generation on a system, these resources may provide voltage regulation and reactive power control capabilities comparable to that of conventional generation. Further, wind plants may provide dynamic and static reactive power support as well as voltage control in order to contribute to power system reliability.").

[107] A. Ellis et al., Reactive Power Performance Requirements for Wind and Solar Plants, *available at* http://energy.sandia.gov/wp/wp-content/gallery/uploads/ReactivePower_IEEE_final.pdf.

[108] NREL, Active Power Controls from Wind Power, *available at* http://www.nrel.gov/electricity/transmission/active_power.html ("Wind power can act in an equal or superior manner to conventional generation when providing active power control, supporting the system frequency response and improving reliability.").

[109] Drake Bartlett, Wind Plants on Automatic Generation Control, *available at* http://www.nrel.gov/electricity/transmission/pdfs/wind_workshop2_13bartlett.pdf.

[110] NERC, Long-Term Reliability Assessment, *available at* http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.

	-Wind can provide frequency response, but it is typically more costly for it to do so than for other resources as it requires curtailing wind generation in advance[111]	- Only 70-75% of generators have governors that are capable of sustaining frequency response for more than one minute, and about half of conventional generators have controls that may withdraw sustained frequency response for economic reasons[113] - "Only 30% of the units on-line provide primary frequency response. Two-thirds of the units that did respond exhibit withdrawal of primary frequency response." So, "Only 10% of units on-line sustain primary frequency response."[114]
Inertial response	-Can provide with no lost production by using power electronics and the inertia of the wind turbine rotor; this capability is commercially available but not widely deployed because there is no payment for any resource to provide this service[115]	-Provides

pdf ("However, by causing conventional generators to have their output dispatched down, wind and solar generation can increase generator headroom and, therefore, the amount of total frequency response being provided.").

[112] NERC, Comments in Response to FERC Technical Conference, *available at* http://www.nerc.com/files/FinalFile_Comments_Resp_to_Sept_Freq_Resp_Tech_Conf.pdf.

[111] NERC, Long-Term Reliability Assessment ("Wind resources can offer inertia and frequency response, depending on the design attributes of a given wind plant.").

[113] NERC, Frequency Response Initiative Report, *available at* http://www.nerc.com/docs/pc/FRI_Report_10-30-12_Master_w-appendices.pdf, pages 32-33

[114] *Id.* at 37.

[115] GE, Impact of Frequency Responsive Wind Plant Controls on Grid Performance, *available at* http://web.mit.edu/windenergy/windweek/Presentations/GE%20Impact%20of%20Frequency%20Responsive%20Wind%20Plant%20Controls%20Pres%20and%20Paper.pdf.

Increases need for operating reserves, integration cost	- Very small impact on total reserve need and integration cost	-Contingency reserve needs and costs are quite large

103. PUCT declarant Lloyd further discusses "unique reliability needs related to voltage support, system inertia, and stability issues" related to the delivery of additional wind generation from the Texas Panhandle.[116] However, analysis by ERCOT demonstrates that those are transmission system issues primarily caused by the fact that the CREZ transmission upgrades were never fully built out as planned.[117] ERCOT's analysis finds that completing that buildout with the low-cost upgrades of adding a second circuit on an existing CREZ transmission path and building one new double-circuit 345-kV transmission line, in combination with the addition of reactive power devices to strengthen the local grid, will allow full delivery of an additional 2,800 MW of wind generation from the Panhandle.

Capacity and coal plant retirement concerns can be easily addressed

104. Lloyd and other declarants[118] also discuss concerns about addressing the power system's need for capacity to meet peak demand. First, it should be clarified that adding wind generation always contributes to meeting the power system's need for capacity, with wind only reducing the need for capacity. Contrary to common

[116] Lloyd Decl. ¶ 29

[117] ERCOT, Panhandle Renewable Energy Zone Study, *available at* http://www.ercot.com/content/news/presentations/2014/Panhandle%20Renewable%20Energy%20Zone%20Study%20Report.pdf.

[118] *See, e.g.,* McLenna Decl. ¶ 19.

misconceptions, such as those voiced by AECI declarant Jura,[119] adding wind energy cannot increase the power system's need for capacity. As explained above, the impact of wind energy on total power system variability is quite small, so all U.S. power systems have more than enough technical flexibility to accommodate even a very large addition of renewable generation without adding any new flexible capacity.[120] Studies by grid operators and other experts confirm that wind energy does make large contributions to meeting power system capacity, with between 50% and 100% of a wind plant's capacity factor typically counting towards meeting system capacity needs.[121]

105. While this capacity value is lower than that of some other resources, it should be kept in mind that all resources experience forced outages, output derates due to high ambient air or cooling water temperatures, fuel unavailability, transmission congestion, and other challenges that keep all power plants significantly below 100% capacity value. As a result, declarant Lloyd's statement that "actual production of wind energy during peak demand periods can fall substantially below even this discounted number"[122] is true of all power plants. All power plants can and do experience an outage, derate, or fuel unavailability

[119] Jura Decl. ¶ 27 ("The construction costs associated with building new renewable generation (including any backup generation to up-balance renewables due to a variable capacity factor").

[120] No renewable integration study has found physical limits to power system flexibility that would constrain very high renewable penetrations, *available at* http://uvig.org/resources/ (detailing studies).

[121] NREL, Eastern Wind Integration and Transmission Study, at 54. *available at* http://www.nrel.gov/docs/fy11osti/47078.pdf.

[122] Lloyd Decl. ¶ 13

that causes them to contribute little or no power, well below their capacity value, when the system needs it most. For example, last year one-third of MISO coal plants had their fuel supplies curtailed due to railroad constraints,[123] natural gas pipelines regularly experience congestion or even supply shortages,[124] and fossil and nuclear plants can fail to function in extreme weather or when their cooling water supplies are too hot.[125]

106. As one noteworthy example, wind plants operated at a very high level of output while other power plants experienced unexpected outages or fuel supply shortages during several extreme cold events across the country in January 2014.[126] During these cold snaps, many coal plants experienced outages due to equipment failures, frozen coal piles, and other unexpected problems, rebutting claims by some declarants that only coal plants are reliable during extreme weather.

107. Given these recent events in which many conventional power plants of the

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[123] RTO Insider, Low Coal Stockpiles Boost MISO Off-Peak Prices, *available at* http://www.rtoinsider.com/miso-coal-stockpiles-11821/.

[124] PJM, Analysis of Operational Events and Market Impacts during the January 2014 Cold Weather Events, *available at* https://www.pjm.com/~/media/documents/reports/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx.

[125] NERC, Polar Vortex Review, *available at* http://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf; UCS, Energy and Water Use, *available at* http://www.ucsusa.org/clean_energy/our-energy-choices/energy-and-water-use/infographic-energy-water-collision.html#.VlRq9r8k1mo.

[126] AWEA, Wind Energy Saves Consumers Money During The Polar Vortex, *available at* http://awea.files.cms-plus.com/AWEA%20Cold%20Snap%20Report%20Final%20-%20January%202015.pdf.

same type experienced unexpected simultaneous "common mode" failures, energy portfolio diversity is becoming an increasingly important consideration. Wind energy provides significant value by diversifying our electricity mix, making it more reliable.

108. Because all generating resources experience outages, wind's capacity value contribution can be accounted for using the same statistical methods used for other power plants.[127] Decisions about meeting the power system's need for capacity should be made by looking at the balance of the energy, capacity, and flexibility needs of the system and finding the best mix of resources to meet those needs. Because no single resource excels at providing all three of those needed services, grid planners typically rely on a division of labor among resources to most cost-effectively meet the system's need for reliability, and wind energy makes valuable contributions to meeting those needs.[128]

109. Many U.S. power systems currently have a surplus of capacity. For those that do not, additional capacity can be obtained at relatively low cost through demand response, energy efficiency, the more than 45,000 MW of new gas generation that is already being built,[129] or even retaining existing generating capacity, as discussed below. Retaining capacity is often an attractive option, as doing so only

[127] NREL, Determining the Capacity Value of Wind: An Updated Survey of Methods and Implementation, *available at* http://www.nrel.gov/docs/fy08osti/43433.pdf.

[128] AWEA, Wind energy helps build a more reliable and balanced electricity portfolio, Chapter 7, *available at* http://awea.files.cms-plus.com/AWEA%20Reliability%20White%20Paper%20-%202-12-15.pdf.

[129] NERC, Long-Term Reliability Assessment, at 18, *available at* www.nerc.com/pa/RAPA/ra/Reliability Assessments DL/2014LTRA_ERATTA.pdf.

incurs a plant's ongoing fixed costs and does not significantly affect emissions because emissions are a product of energy production, not maintaining capacity.

110. Energy costs are a far larger component of consumers' electric bills than capacity costs. The value recovered in PJM's separate capacity market is only about 1/6 of the total value recovered in the energy market.[130] This is confirmed by comparing the very large total production cost of the power system, which is largely composed of fuel costs, versus the far smaller fixed costs and annualized capital cost of total power plant capacity levelized over the very long lifetime of those assets.

111. In many cases, the power system's needs for capacity can be most cost-effectively met by simply not retiring some existing resources, combined with the capacity value contributions of new resources that are being added anyway. A common misconception, expressed in most of the Petitioners' declarations, is that the CPP requires fossil power plant retirements. Rather, the CPP only requires that, in aggregate, high-emitting generators run less so that total power system emission caps can be met. Unlike generating capacity-focused environmental regulations, the CPP is an energy-focused rule with many viable pathways for existing power plants to meet aggregate power system emission limits through changes in their operating hours and thus the overall generation mix.

112. As a result, nothing in the CPP imposes a specific requirement for a power

[130] PJM State of the Market 2013, at 12, *available at* http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2013/2013-som-pjm-volume1.pdf.

plant to install pollution control equipment or incur other costs for it to be able to continue operating at all. Rather, the CPP sets a cap on total power system emissions and establishes market-based solutions to obtain those reductions using all resources available on the power system. Retaining a high-emitting generator to run during a reduced number of hours to meet reliability needs has a negligible impact on carbon emissions and therefore is a viable strategy for CPP compliance.

113. Interestingly, a number of analysts have found that deploying wind energy while maintaining some existing coal generating capacity is a highly cost-effective way to comply with the CPP.[131] Combining low-cost existing coal plants with the low-cost, zero-emission generation and additional capacity value provided by wind energy can be an attractive way to meet the CPP emission reduction requirements while also retaining low-cost sources of energy and capacity.

114. The Energy Information Administration (EIA) and other analysts have found that wind and other zero-emission resources make it more economically possible to maintain existing coal capacity by allowing those generators to operate for more hours and still meet the CPP. Specifically, an often under-appreciated benefit of using wind energy for CPP compliance is that it allows states and utilities to make less drastic changes to their power systems, relative to using a

[131] AWEA, EIA analysis shows wind is most cost-effective option for Clean Power Plan, *available at* http/\/awea.files.cmplus.com/AWEA%20report%20on%20EIA%20CPP%20analysis%20July%202015.pdf; EIA, Analysis of the Impacts of the Clean Power Plan, *available at* https://www.eia.gov/analysis/requests/powerplants/cleanplan/.

resource with some emissions for CPP compliance. For example, because a MWh of gas generation emits nearly half as much CO2 as a MWh of coal generation, nearly twice as many MWh of coal generation must be displaced to achieve the same level of emissions reductions versus if a zero-emission compliance option were used instead. As a result, zero-emission resources like wind provide states with the greatest flexibility for complying with the CPP and reduce the magnitude of changes that are required in the generation mix.

115. As shown in Figures 9, 10, and 11 in AWEA's summary of EIA's analysis of the Proposed CPP,[132] regions that used the most wind energy for CPP compliance in EIA's analysis saw the least drastic changes to their power systems, as indicated by them experiencing far fewer coal plant retirements. This is because zero-emission wind energy provides states with valuable flexibility for finding the optimal CPP compliance mix, relative to low-carbon energy sources that have some emissions.

116. Many Declarants misguidedly express concerns about expected coal power plant retirements based on the results of Integrated Planning Model (IPM) modeling runs released by EPA as part of the non-binding Regulatory Impact Analysis that accompanied the CPP. A crucial flaw in this reasoning is that IPM modeling is indicative, not determinative. As explained by Respondent declarant Burtraw, any modeling result is simply a product of the assumptions and methods used in that analysis, and all modeling exercises are an imperfect representation of

[132] *Id.*

reality. Even the American Coalition for Clean Coal Electricity paper submitted as an attachment to Petitioner declarant Heidell's testimony argues against some of the assumptions and results in EPA's IPM CPP analysis.[133] As a result, the results of that IPM modeling, like the results of any modeling exercise, should not be viewed as a deterministic or perfect prediction of the future. This is particularly true with modeling of the CPP because, as explained above, the CPP does not require any specific power plant to retire and provides a wide range of options for states to comply without retiring existing generators.

117. For example, due to what I believe to be conservative assumptions, the IPM modeling shows far less wind deployment to comply with the CPP than I expect will occur in reality. Importantly, this underestimated deployment of wind energy in EPA's IPM modeling likely caused an overestimate of the fossil capacity retirements that would result from the CPP. As explained above, EIA and other analysts have found that greater use of renewable energy leads to fewer coal retirements because renewable energy provides more emissions reductions per MWh than coal-to-gas shifting, so a smaller shift in the generation mix is needed for CPP compliance with the use of zero-emission resources like wind. As a result, the IPM modeling likely overestimated fossil retirements because it underestimated wind generation additions. This example illustrates one of the many ways in which IPM modeling is subject to uncertain assumptions and therefore is not determinative.

[133] For example, see the statement in this paper that "This [EPA] estimate is far greater than what is projected by other analyses…."

118. Turning to specific Petitioner declarations, Luminant's declaration makes the misguided claim, without evidence, that expanding wind generation for CPP compliance will accelerate and not prevent coal retirements. First, this claim does not take into account the mechanism described above, wherein wind's lack of emissions allows greater CPP compliance flexibility that helps preserve existing coal capacity. Second, Luminant's claim that the CPP would provide preferential dispatch for renewable energy does not make sense. Market-based economic dispatch already places wind generation as one of the first resources to be used on the electricity supply curve due to its lack of fuel cost and therefore low marginal production cost,[134] and carbon regulation would not change that.

119. Luminant's claim that wind has an "artificial" impact on electricity markets that will increase coal plant retirements is also incorrect. This impact is no more "artificial" than low-fuel-cost coal, nuclear, or hydroelectric generation driving down the electricity market clearing price. Moreover, because fossil generators almost always set the electricity market clearing price and wind generators almost never do, low fossil fuel prices have a drastically larger impact on electricity market prices than adding wind generation.[135] Regardless, any market-based impact from the CPP driving greater use of wind generation will not happen until the wind plant comes online. Because EIA and other analysts predict that will not

[134] AWEA, The facts about wind energy's impacts on electricity markets, *available at* http://awea.files.cms-plus.com/FileDownloads/pdfs/AWEA%20white%20paper-Cutting%20through%20Exelon's%20claims.pdf.

[135] AWEA, FERC Commissioner: Exelon attacks on PTC "a distraction," *available at* http://www.aweablog.org/ferc-commissioner-exelon-attacks-on-ptc-a-distraction/.

occur until wind plants begin earning CPP credit many years from now,[136] there is no near-term cost or threat of coal plant retirements to Luminant as a result of the CPP.

120. Statements made in many Petitioners' declarations also undermine their argument that the CPP is likely to cause coal power plants to retire in the next year or two. If utilities and states truly believe that irrecoverable costs will be incurred due to the CPP and the CPP is likely to be overturned, as they claim in their declarations, then a utility is unlikely to retire a plant any earlier than is necessary to comply with the CPP, which is not until 2022. Moreover, there is currently an incentive to retire as late as possible due to EPA's proposal that, under the Federal Implementation Plan, fossil plants that retire significantly in advance of the CPP compliance period would forfeit their mass-based emission allowances.[137] In contrast to the IPM analysis, EIA's analysis of the proposed CPP found the CPP would cause few if any generator additions or retirements until the year the CPP takes effect.[138]

121. Returning to the strategy of using new wind and existing coal to comply with the CPP, the cheapest and fastest solution to Petitioners' and declarants' concerns about meeting capacity needs is often simply retaining the capacity resources that

[136] EIA, Analysis of the Impacts of the Clean Power Plan, *available at* https://www.eia.gov/analysis/requests/powerplants/cleanplan/.

[137] EPA, Allowance Allocation Proposed Rule Technical Support Document, *available at* http://www.epa.gov/sites/production/files/2015-11/documents/tsd-fp-allowance-allocations.pdf.

[138] EIA, Analysis of the Impacts of the Clean Power Plan, dataset, *available at* https://www.eia.gov/beta/aeo/#/?id=9-CPP2015&cases=ref_CPP2015~rf15_111_all

already exist on the power system. There is no lead-time associated with retaining existing generating capacity. Because wind generation can be added to the power system quickly, in sufficient quantity to meet the CPP, and without any near-term cost to states or utilities, as established in the first section above, this solution addresses all objections raised by Petitioners that the CPP must be stayed to protect them from incurring immediate costs.

122. Regardless of the compliance pathway chosen by a state or utility, there are a number of quickly-deployable solutions for any reliability concerns that may emerge at a later point, so no near-term costs need to be incurred under any circumstance. Beyond the transmission and renewable and natural gas generation additions that are already in progress, a number of other solutions can be quickly added on short notice. Demand response and energy efficiency can be quickly deployed, as can a number of the transmission system equipment upgrades described in the preceding section of this declaration. As established earlier in this declaration, many renewable generators can also be quickly deployed, particularly those for which development is already well underway.

123. Finally, not retiring an existing generator is often the easiest and cheapest, and certainly the fastest, solution to a potential reliability concern that could emerge at a later point in time. There is a well-established precedent of some generators being temporarily awarded reliability-must-run status by grid operators to provide essential reliability service support to the power system until longer-term solutions, like transmission upgrades or new generation additions, can be

completed.[139] Unlike previous environmental regulations, the CPP provides even greater flexibility for such solutions because the rule is based on energy and not capacity requirements, so retaining a higher-emitting generator to run during a reduced number of hours to meet reliability needs will have a minimal impact on compliance.

Renewable energy can be readily used for compliance without new state authority, regardless of the compliance pathway chosen in state plans

124. Compliance with federal rules is an integral responsibility of state environmental regulatory authorities, public utility commissions, and other state agencies. To the extent that there are any costs associated with creating a state compliance plan over the next year or so, the costs and staff required by these compliance duties are factored into the agencies' annual budget and staffing plans as this falls within their routine duties. In addition, contrary to the assertions of movants that state planning for the CPP would require burdensome coordination among state agencies, interaction among agencies is already a routine function of these agencies and thus should not impose significant incremental costs.

125. Although movants depict the CPP rulemaking process as complex, states can prepare CPP implementation plans using the same process that has proven successful for other federal regulatory programs. The final CPP rule provides ample flexibility and a wide range of compliance paths to fit states' varying generation mixes and regulatory structures.

[139] PJM, Generation Deactivation Study Results, *available at* http://www.pjm.com/planning/generation-deactivation/gd-study-results.aspx.

126. Some movants incorrectly claim that states must enact new authorities and use state policies to achieve CPP compliance. However, state policies are only required under the "state measures" compliance pathway, which states are not obligated to pursue.

127. Emissions trading, often cited by economists as the most cost-efficient emissions reduction measure, is favored by the plan and is part of the proposed federal implementation plan and model rule that states can choose to adopt instead of developing and submitting their own plan. A state could also adopt an emission trading program in a state plan of its own in order to ensure its electric generating units comply with the Clean Power Plan. As such, the rule would not require a state legislature to grant state public utility commissions new powers. States will not, as movants assert, need authority to mandate the construction of power plants, require electric generating units to enter into power purchase agreements, or otherwise direct the actions of existing generators. States already have a process established for approving the addition of new generation through construction and power purchase agreements.

128. A properly structured emissions trading program could integrate seamlessly with the regional competitive electricity markets and provide appropriate economic incentives for operators of electric generating units to reduce emissions — without any need for central planning or direction from a state utility commission. Under the CPP, those having operational control of electric generating units will continue to make decisions about the amount and type of generation to construct and operate based on electricity market prices. In

addition, regulators and owners of electric generating already have extensive experience administering and complying with emissions trading programs for non-greenhouse gas pollutants, such as acid rain and other permit trading programs.

Irreparable harm to wind industry from a stay

129. While Petitioners claim a stay would prevent harm to them – an incorrect claim that is rebutted by all of the points provided above – a stay would cause irreparable harm to the wind industry. There are several ways in which the wind industry is asymmetrically exposed to the cost of a stay, while Petitioners are not exposed to such costs in the absence of stay.

130. First, the Clean Energy Incentive Program takes effect earlier than the other provisions of the CPP, making the wind, solar, and low-income energy efficiency industries subject to harmful near-term costs and uncertainty associated with a stay while, for the many reasons enumerated throughout this filing, Petitioners would not be harmed in the near-term from the absence of a stay.

131. Under the proposed CEIP, wind and solar projects that commence construction following submission of a state compliance plan (i.e. sometime between September 6, 2016 to September 6, 2018) are eligible to begin receiving CPP emission credits for all generation produced after January 1, 2020. In contrast, CPP compliance obligations on EGUs do not commence until January 1, 2022. Because the CEIP commences at least two and potentially more than five years before the start of CPP compliance, the wind, solar, and low-income energy efficiency industries are exposed to harm from a stay that EGUs and other

Petitioner parties are not exposed to from the lack of a stay.

132. Second, the uncertainty associated with a stay will impose costly risk on long-term business decisions that are being made by renewable energy manufacturers, such as decisions about whether to close existing manufacturing facilities or invest in new manufacturing facilities. Because the CPP is expected to drive demand for adding new renewable capacity, but a stay of the CPP would not drive demand for manufacturing capacity to construct new high-emitting fossil generating capacity,[140] a stay asymmetrically harms the renewable energy industry while lack of a stay could not harm the non-existent supply chain for building new high-emitting EGUs.

133. While states and utilities would not need to incur near-term costs associated with developing wind resources that could be used for CPP compliance, as explained at length in the first section of this Declaration, wind project developers, wind turbine manufacturers, and component suppliers are making long-term investment decisions that would be negatively affected by the uncertainty caused by a stay.

134. For example, wind project developers assess likely future demand from utilities for wind energy when making decisions about starting to develop wind projects. This can include sizeable investments in wind resource assessment equipment, decisions about staffing, the hiring of wind resource assessment and site

[140] *See, e.g.,* EIA, Scheduled 2015 capacity additions mostly wind and natural gas, retirements mostly coal https://www.eia.gov/todayinenergy/detail.cfm?id=20292; additional data *available at* https://www.eia.gov/beta/aeo/#/?id=9-CPP2015&cases=ref_cpp2015~rf15_111_all.

permitting experts, and other costs.

135. Wind turbine manufacturers and their numerous component suppliers also routinely make major long-term decisions about investments in manufacturing facilities and equipment, R&D, staffing and worker training, and other costs. These can include decisions about adding new manufacturing facilities and staff or shutting down existing facilities and reducing their current workforce. Given the size, longevity, and irreversibility of these manufacturing investments, demand for wind energy 5-10 years in the future is a key factor in these decisions.

136. Unfortunately, the wind industry has previously seen the economic harm associated with policy uncertainty like that which would be caused by a stay of the CPP. In 2012, Congress did not extend the renewable Production Tax Credit until the first days of January 2013. Because at that time the PTC required wind plants to be placed in service by the end of 2012, manufacturing of wind turbine equipment and other components had essentially dried up in early 2012 when turbines and other components that were to be installed that year were completed but no new orders were being placed due to uncertainty about whether the PTC would be extended. As a result, dozens of manufacturing facilities closed, employment in the U.S. wind industry was reduced by around 30,000 jobs in 2013, and wind project investment fell 92% in 2013 from what it had been in 2012. Employment in the U.S. wind industry has still not fully recovered from the impact of that uncertainty, and many turbine and component manufacturers permanently closed or have not returned to the U.S. market. Lawrence Berkeley National Laboratory and other experts have documented how policy uncertainty

harms the wind industry.[141]

137. The uncertainty associated with a stay could have major impacts on the U.S. wind industry that would ripple throughout the broader economy. Currently, American wind power supports 73,000 jobs in all 50 states, including nearly 20,000 manufacturing jobs at more than 500 factories in 43 states.[142] DOE's Wind Vision study projected that with stable policy, the wind industry could grow to drive $30 billion/year in investment during the 2020s. Wind industry employment would reach 201,000-265,000 jobs by 2030, with $350 million in wind plant land lease payments in 2020 and $650 million in 2030, and $900 million in property tax payments in 2020 and $1.77 billion in 2030.[143]

138. A large share of these benefits accrue to rural impoverished areas. More than 99.8 percent of online utility-scale wind projects in the U.S. are in rural areas, and nearly 70 percent of online wind capacity is installed in rural areas that fall below the median household income in the U.S. Wind projects have provided a cumulative $95 billion in private investment and continue to provide $140 million in annual lease payments to landowners in these low-income counties alone. In low-income counties where the wind industry has invested at least $200 million,

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[141] *See, e.g.,* LBNL, Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States, *available at* https://emp.lbl.gov/sites/all/files/REPORT%20lbnl%20-%2063583_0.pdf.

[142] AWEA, Wind energy facts at a glance, *available at* http://www.awea.org/Resources/Content.aspx?ItemNumber=5059.

[143] DOE, Wind Vision Report, at xlix, *available at* http://www.energy.gov/sites/prod/files/wv_executive_summary_overview_and_key_chapter_findings_final.pdf.

that investment translates to more than $15,000 per resident. In low-income counties where wind industry investment totals more than $1 billion, the per capita investment is more than $25,000. These investments typically directly translate into increases in property tax revenue, investment in local school districts and other government services, and significant local economic development from the construction and operation of the wind projects.[144]

139. As a separate metric, nearly 50 percent of online wind capacity is installed in designated rural child poverty areas. Wind projects in these areas have provide more than $65 billion in private investment and over $100 million in annual payments to landowners.

140. Future wind development is expected to continue to occur in these rural impoverished areas. In fact, under construction wind projects are more heavily located in these rural impoverished areas than operating wind projects, with 58 percent of under construction wind capacity located in rural child poverty areas (versus 50 percent for operating projects) and 77 percent of under construction wind capacity located in counties that fall below the national median for household income (versus 70 percent for operating projects).

141. The economic benefits of wind industry manufacturing are large and widely dispersed, and many wind industry manufacturing facilities are also located in low-income areas. A significant number of these manufacturing facilities are

[144] *See, e.g.,* Wind project helps provide every student in Ohio school district a computer, *available at* http://www.aweablog.org/wind-project-helps-provide-every-student-in-ohio-school-district-a-computer/.

located in parts of the Eastern U.S., and particularly the Southeast, that have not yet seen major wind industry deployment, ensuring that the wind industry employs a significant number of people in all 50 states. A stay would introduce uncertainty into long-term wind industry business decisions that would result in significant harm to all of these communities.

142. In conclusion, Petitioners' request for a stay is without merit, and the grant of a stay would harm the wind industry and the broader U.S. economy.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 7th day of December, 2015, in Washington, D.C.

Signature

Michael Goggin

Michael Goggin

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents

DECLARATION OF JOHNATHAN HLADIK

I, Johnathan Hladik, declare as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors.

2. I am Johnathan Hladik, Policy Program Director for the Center of Rural Affairs ("the Center") .

3. I have Bachelors in Environmental Economics and Natural Resources, a Masters in Environmental Policy, and a Juris Doctorate in Environmental Law.

4. The Center for Rural Affairs is a nonprofit organization founded in 1973 to establish strong rural communities, social and economic justice, environmental stewardship, and genuine opportunity for all while engaging people in decisions that affect the quality of their lives and the future of their communities.

5. The Center does not advocate for the interests of a particular group but advances a set of values that reflect the best of Rural America, including stewardship of the natural environment. Rural communities are intertwined with the local environment and are disproportionately impacted when the environment is harmed. The Center advocates environmental stewardship through several achievable goals, including conservation, a clean energy economy, energy efficiency, and strong regulations on carbon pollution. The Center focuses on clean energy because it provides a significant opportunity to diversify the rural economy, create new opportunity and address the root cause of climate change.

5. My declaration is based on my direct experience as a professional responsible for assisting landowners and other rural stakeholders

in equitable and sustainable clean energy projects.

6. I am supplying this declaration at the request of movant-intervenors the American Wind Energy Association ("AWEA").

7. The purpose of my declaration is to provide information to the Court relating to the question of whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

8. In preparation for this declaration, I have become familiar with: (a) the Clean Power Plan; (b) the Petitions for Stay; and (c) the declarations thereto. In addition, I am acquainted with the other documents cited in this declaration.

9. Renewable energy, like wind, has a proven record of benefitting rural communities. Renewable energy provides new opportunities, new sources of revenue, and a new source of income for many farmers and ranchers.

10. For example, communities in the state of Iowa have seen economic and environmental community-wide benefits due to wind energy. Around 85% of Iowans view wind energy favorably (a higher rate

than that of any other generation source) and communities throughout the state have already been engaged in new wind energy development as the state approaches its milestone of getting 30% of the energy generation mix from wind. Wind's economic benefits to Iowa communities have not gone unnoticed: over 5,700 megawatts of wind capacity have been developed in the state in the past two decades, leading to nearly 7,000 new jobs created to manufacture, construct, and operate turbines and wind farms. These jobs bring employees to rural areas, providing a boost to the local area.

11. As the wind energy industry has grown, more small towns and rural areas have been able to experience the new possibilities that wind development can deliver. Bringing new opportunities like renewable energy development to these places has proven to be an essential aspect to creating vibrant and healthy communities. An immediate halt on policies that promote renewable energy, even a temporary measure like a stay of the Clean Power Plan, will harm rural communities that are beginning to realize these benefits and hinder the ability of additional communities to engage in these opportunities.

12. Renewable energy development in rural communities also provides

numerous indirect benefits to the communities. The property tax revenue generated from wind energy projects provides services for the rural communities, including new funds for essential services like schools, polices, and emergency services. Direct land lease payments benefit private landowners, with Iowa landowners receiving over $17 million each year from land lease payments.

13. The benefits of wind energy to rural communities are even felt in states with less wind development. For example, small towns in Nebraska, which has high wind energy potential but less development than Iowa, have experienced these opportunities. Broken Bow, a town of just over 3,500 people in Custer County, Nebraska, had two wind farms built in the county in 2012 and 2014, which created 400 construction jobs, 23 permanent positions operating the facilities, and $16 million in direct community investment in Broken Bow. Custer County also receives an additional $185,000 from these projects in annual tax revenue. Projects the size of just one of Broken Bow's wind farms can also create $4.8 million in land lease payments and $50.14 million in local economic benefits that reenergizes the economies of rural areas. A halt on incentives like those found in the Clean Power Plan will prevent many other small communities from realizing

these significant benefits.

14. The infusion of new money from projects and creation of new permanent jobs can also have a large impact on rural areas that have suffered from slow population loss. Clean energy addresses an economic need in underserved rural communities. For more than half a century rural communities have been losing population, often at a rate of 10% per decade due to a lack of economic opportunity resulting from a changing agricultural economy. Renewable energy offers a significant opportunity to diversify the rural economy and create new opportunity.

15. For example, a 50 megawatt wind project installed near the community of Petersburg, Nebraska, revitalized the town and surrounding county. The construction workers spent money locally and permanent jobs were created within the community. The president of a local bank remarked that after the project "you can see it on people's faces; hope for new jobs and new families, five new homes have been built and for the first time in years, small children can be seen playing in the park. A new grocery store opened in town." For a town that had a population of 333 at the 2010 census, the significance of the influx of employees and economic benefits that followed the development cannot be

understated.

16. The towns of Broken Bow and Petersburg and communities throughout the state of Iowa, along with similar stories in rural areas across the country, show the transformative potential of new industries like wind energy. As rural communities and small towns continue to confront the challenges of shrinking population sand opportunities, it is important for rural advocates like the Center for Rural Affairs, to look towards the future. Wind energy has proven to be one of several new and growing industries that can bring opportunities to small towns and rural areas and it has demonstrated its potential to help build strong and thriving, lasting communities.

17. Solar energy development brings a lot of these same benefits to rural communities. Installing new solar systems provides new jobs in these areas, and solar is one of the most affordable small-scale renewable energy options for households and landowners. As the price of solar continues to drop, more rural communities are considering the benefits of community solar projects as well, using local expertise and investment to install projects that will generate clean and renewable energy locally.

18. Petitioners have requested a stay of the Clean Power Plan.

Petitioners claim that their affected industries will be immediately harmed by the Clean Power Plan. Instead, I believe rural communities and their interests will be greatly harmed by a delay in the implementation of the Clean Power Plan.

19. The claim in the Petitioners' briefs and declarations that states and utilities will need to incur immediate costs to begin developing low-carbon generation to comply with the Clean Power Plan is incorrect for a number of reasons. Rural communities throughout the country have already begun developing low-carbon generation. Based on my experience, the claims made by the Petitioners' declarants about the lengthy amount of time it takes to procure new low-carbon generation, such as wind and solar energy, are unfounded.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 7th day of December, 2015, in Lyons, Nebraska.

Jonathan Heist

Name of Declarant

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF TODD HORSMAN

I, Todd Horsman, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am the Vice President of Regulatory and Delivery. My duties include guiding our position in the North American market for energy related technology solutions and services.

2. Landis+Gyr supplies solutions to the energy sector to enable integration of clean power while ensuring reliability and resilience of the electricity grid for consumers. Specifically, Landis+Gyr provides advanced metering and

intelligent-energy management products and other "smart grid" technologies and services.

3. Landis+Gyr is a member of proposed intervenor-defendant Advanced Energy Economy ("AEE"), and supports AEE's efforts to spur the growth of advanced energy companies and expand awareness of new energy technologies and the benefit these technologies provide to the electricity grid and to consumers. I submit this Declaration in support of AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan," or "CPP").

4. As implementation plans are weighed for the Clean Power Plan, it is important to consider how this effort will be enabled. Contributions to meeting CPP goals will come from a variety of solutions, especially as electric utilities do their part to reduce emissions. As a leading technology provider to electric utilities, Landis+Gyr has developed and implemented a variety of technologies that support these CPP goals and we are pleased to outline the key elements utilities are using today, and will be leveraging for the future. Below we have outlined several areas of compliance and have detailed the relevant enabling technology.

Managing Peak Power to Mitigate Emissions

5. Peak usage of electricity is not only expensive, it can also drive increased carbon emissions due to the use of peaker plants to meet short-term load requirements or required construction of new generation facilities to support increased load on a distribution system. Demand Response applications are one alternative for addressing peak usage without increasing emissions. Utilities can leverage their advanced metering infrastructure ("AMI") networks to remotely and reliably adjust thermostats and other large energy loads (via sophisticated load control devices) during peak grid usage in a way that does not inconvenience or interfere with the customer's lifestyle. Customer-side Energy Management platforms enable customers to set their comfort preferences, which are then applied when there is a peak usage event to ensure customers are protected. Utilities view this saved load as an aggregated resource, allowing them shave the peak demand. This technology enables a partnership between the utility and the customer, where customers are empowered to better manage their utility bills and a cleaner environment. Landis+Gyr's technology platform provides solutions like these for utilities today and anticipates their use in meeting emissions targets.

6. This capability is enhanced through Landis+Gyr's analytics platform, which utilizes AMI meter data to locate, rank, and analyze customers that significantly contribute to daily, monthly and yearly peaks. Identified customers or

specific areas of the distribution grid may be priority targets for demand response initiatives. Utilities can also use this information to determine strategic placement and dispatch of distributed resources for peak load reduction.

7. Distributed energy resources, such as battery storage, provide benefits through mitigation of peak usage and lowering related emissions as well. When strategically deployed to areas that have power delivery constraints or reliability issues, they can improve power quality and resiliency of the grid, providing ancillary benefits beyond peak reduction. Advanced technologies, provided by Landis+Gyr, include both grid-scale batteries as well as the intelligence software platforms required to dispatch and optimize these distributed generation sources. These solutions, or any combination of them, allow the next generation of grid technology to supply the needs of CPP plan implementation.

Integrating Renewables at the Edge of the Grid

8. Another attractive option for reducing long-term emissions is to increase the grid's supply of renewable energy sources. As costs for these new sources of power have dropped rapidly over the last decade, they have become appealing solutions for decreasing emissions. At the same time, the increased penetration of these technologies into a grid that was not originally designed for distributed resources can create challenges. Fortunately, the potential issues associated with renewable resources, such as intermittency, back-flow, and optimal

location selection, are all being solved today with a variety of innovated technology provided by Landis+Gyr.

9. Another example of how Landis+Gyr technology enables utilities is the use of grid analytics to optimize the placement of renewable energy sources on their grid. The Distributed Energy Resource Optimizer application combines meter and sensor data for use in planning and integrating distributed energy resources, while taking into account network safety, compliance, reliability, and cost-effectiveness. This enables utilities to examine the impact of sudden loss of DER generation (such as solar or wind intermittency) on power flows, voltages, and voltage flicker. It also looks at the impacts of distributed resources on the distribution system at different penetration levels, including electric vehicles. With this, the utility is able to determine the optimal amount of distributed resources to integrate on the distribution system, as well as the maximum resources a feeder or substation can handle without adversely affecting power quality or reliability.

10. Energy storage also plays a role in integrating renewable generation efficiently into the grid. Battery storage can store renewables when the demand on the grid is lower, allowing clean energy to be shifted to times it is needed. In

addition, batteries can improve grid stability by injecting power on the grid when renewable sources may be fluctuating and causing frequency disturbances.

11. Altogether, these technological advances and the platforms leveraged for peak emissions can be optimized for renewable integration, allowing Landis+Gyr's demand response, energy storage, and grid analytics platforms to directly mitigate intermittency and support the requirements of a distribution grid.

Improving Grid Reliability with Distributed Sensing

12. The implementation of Landis+Gyr's distribution grid technologies, such as advanced analytics and remote sensing, are dramatically improving reliability for electric utilities. Many outages on the distribution grid are caused by aging or overloaded infrastructure, or environmental conditions such as overgrown vegetation. How a utility manages these reliability threats can be dramatically improved by utilizing advanced sensing and analytics technologies to provide real-time visualization of how the distribution grid, and individual grid assets, are performing.

13. Remote sensors that are integrated into advanced metering infrastructure ("AMI") and the distribution grid provide constant monitoring for a utility, allowing them to proactively improve system reliability. Advanced grid analytics applications take the data from these sensors to create an electricity

distribution model that is capable of analyzing the grid and providing actionable recommendations for improving network performance and grid reliability.

14. An example of this is the Reliability Planner's capabilities within Landis+Gyr's grid analytics platform. Using metering and sensing data, as well as data from other utility sources (including outage management, and geographical information systems), this platform provides upgrade recommendations by identifying specific equipment to target for preventative maintenance, with consideration for maximizing the capital improvement planning and budgeting process. Utilizing this type of analytics allows utilities to strategically improve network reliability in a cost-effective manner as measured by such key performance indicators such as SAIDI, SAIFI, cost per outage event, revenue lost per outage event, and kW unserved. Further, this application recommends various remedial actions including optimal placement of automated switches and a prioritization of which maintenance strategies will result in the greatest reliability improvement for the utility.

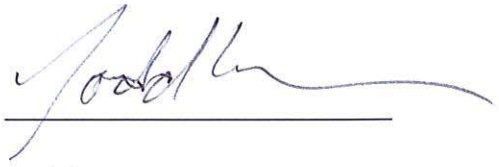
15. In the case of overloaded assets, Landis+Gyr's analytics platform provides system-wide visualization, asset health and performance analysis by using data from meters and Geographic Information Systems to geospatially and dynamically display the distribution network connectivity model. Load profiles of substations, feeders, feeder sections, underground cables, fuses, switches, DA

equipment and distribution transformers are monitored and displayed geospatially. Areas of system overloading are highlighted for action to minimize and even prevent outages caused by equipment failure. By providing utilities with guidance on right-sizing transformers or other assets, they can improve their plans for preventative maintenance and address a grid that is changing more quickly than ever before as distributed and clean generation and more active energy consumers play a greater role in our electricity grid.

Conclusion

16. Landis+Gyr has deployed and continues to develop and enhance technologies that help utilities manage energy better and support the implementation of the Clean Power Plan. Our technologies improve peak load management, reducing the need for additional carbon-emitting generation, improve reliability through improved preventative maintenance strategies, and optimize the addition of renewable resources on to the distribution grid.

DATED : December 7, 2015



Todd Horsman

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases

(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF RONALD L. LEHR

I, Ronald L. Lehr, declare under penalty of perjury as follows:

1. I am supplying this declaration at the request of movant-intervenor the American Wind Energy Association ("AWEA").

2. The purpose of my declaration is to provide information to the court relating to the question of whether renewable energy industry might suffer harm if a stay were granted of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015)("Clean Power Plan" or "CPP").

3. My direct experience relevant to this declaration includes serving for almost seven years as Commissioner and Chairman of the Colorado Public Utilities Commission, a state constitutional body responsible for regulating electric and gas utilities; representing business interests as a practicing attorney, including utility and renewable energy companies, non-profit and non-governmental organizations, and the State of Colorado on a range of matters involving energy, electric utilities, renewable energy, and energy efficiency; and working as an attorney and consultant on business, financial, and public policy issues directly impacting the wind, solar, and geothermal renewable energy industries.

4. In preparation of this declaration, I have become familiar with: (a) the Clean Power Plan ("CPP"); (b) the Petitions for Stay; and (c) the declarations thereto. In addition, I am acquainted with the other documents cited in this declaration.

5. Petitioners have asked for a stay of the CPP. AWEA is concerned that a stay would harm renewable energy industries in Colorado and the Western states, especially related

to implementation of the Clean Energy Incentive Program ("CEIP"). I have the personal knowledge and experience to understand that a stay would harm the industry and energy consumers in Colorado.

6. My declaration addresses the following:

a. Colorado has robust, cost-effective renewable resources available to be tapped to comply with the CPP and the CEIP.

b. The Colorado bid process produces opportunities to bring cost-effective renewable energy from development companies and the firms that supply products and services. The market produces a range of benefits for consumers and for the state of Colorado generally.

c. Colorado's strong renewable energy markets will provide opportunities to comply with the CPP on a timely basis, supervised by the coordinated efforts of the Public Utilities Commission ("PUC") and Colorado Department of Public Health and Environment ("CDPHE").

d. Colorado's experience proves that renewable facilities can be developed and online in a within the time periods allowed under the CEIP, as long as planning proceeds in a step-wise manner.

e. A stay of the CPP would delay, interrupt, and diminish the Colorado market for renewable energy, harming renewable energy companies, and their suppliers and employees, as well as reducing benefits enjoyed by electric consumers and the citizens of Colorado.

Colorado has valuable, cost-effective renewable energy resources that can be tapped to comply which the CPP and the CEIP.

7. Wind and solar developers have been preparing to monitor and participate in Public Service Company of Colorado's ("PSCo") resource planning process in Colorado. As a result, renewable energy projects exist in various stages of development in and around Colorado. Colorado presently ranks 10th in the nation in wind energy, with 2,343 MW online, and ranks 9th in the nation in solar energy, with 412 MW of solar energy online in 2015.

8. Wind and solar developers promote economic development by spending money in local hotels, stores, gas stations, and by employing local workers. Wind and solar industries have invested over $4 billion in their Colorado generation projects, manufacturing plants, and supply chain operations. One wind company recently reported spending $150,000 per year in rural areas in Colorado.

9. These facilities deliver tax revenues to state and local governments when they are completed and in service that are especially important in rural areas where these projects are located. A county commissioner in Lincoln County, Colorado, recently reported nearly $7 million in sales and use taxes from one eastern Colorado wind project, the Cedar Point Wind Project. Bent County, in southeastern Colorado, has reported annual property tax revenue of $291,233 from the Twin Buttes Power Project. These revenues have been extremely helpful in a time when the small rural county has seen little to no growth in assessed valuations and is struggling from drought, a declining agricultural economy, and job losses. Royalties and lease payments to rural landowners who lease land for projects help them continue to pay taxes and make expenditures for local goods and services, and these expenditures have a multiplied impact in Colorado's rural agricultural economies. Rural areas in the West will see increased economic activity from renewable expansion for CPP compliance. Bracht Decl., ¶10.

10. All of this economic activity brings more jobs. In early 2014 Vestas, a large wind turbine manufacture with four manufacturing facilities in Colorado, projected very active sales seasons throughout 2014 and 2015 and into 2016 as they produced wind turbines, blades, and towers for wind projects. Vestas reports growing sales, so its plant managers in Colorado have

been hiring more workers in recent months. The wind industry alone employs an estimated 5,000 Coloradans, and has invested over $5 billion in the state.

11. The CEIP is creating incentives for renewable energy development activity in Colorado. The CPP is projected to increase investments and jobs in the non-hydro renewables, especially in the early years. One half of the renewable energy industry respondents in a recent industry poll indicated they would ramp up investments to prepare for CPP opportunities. Utility plans to add more generation resources are being analyzed carefully by developers who supply renewable energy with the backdrop of the CPP requirements and potential for early emissions reductions to acquire CEIP allocations. The CPP will not require any substantial change in development activity. Colorado developers are poised to provide renewable energy to participate in the CEIP, and they can do so within the time frames allowed.

The Colorado bid process produces opportunities to bring cost-effective renewable energy from development companies and the firms that supply products and services. The market produces a range of benefits for consumers and for the state of Colorado generally.

12. Renewable resources to supply Colorado consumers are developed and acquired in a highly competitive environment. For example, on April 30, 2013, PSCo received twenty-five bids offering a total of approximately 6,500 MW of new wind, solar, and gas in response to its request for proposals issued in the PUC's most recent resource planning proceeding. Due to healthy competition among suppliers, the final approval and acquisition of 450 MW of wind with 170 MW of new solar reduced prices compared with natural-gas portfolio additions and will bring millions of dollars in cost savings to Colorado electricity ratepayers over the next twenty years.

13. Competitive acquisition of generation to serve future loads reduces costs for Colorado consumers. Robust competition requires regular, predictable planning processes. In Colorado the utilities, under PUC supervision, identify all potential resources and their characteristics, followed by competitive bidding to fill out desired portfolios, provides periodic, public review of the market for least-cost resources. By requiring all forms of generation to compete to gain contracts to supply electricity as part of pre-approved generation portfolios, Colorado regulators and utilities assure their consumers that costs for their utility service are as economical as conditions allow at the time of the acquisition of new resources.

14. Stability and predictability in the markets created by utilities accepting bids for new resources increases efficiencies and reduces costs. In the example provided here, Colorado's model of planning and bidding for new generation, very substantial efforts over many years have achieved the assurance required to produce competitive outcomes. That assurance depends on the planning, bidding, and acquisition process being public, transparent, and fair, so bidders have sufficient confidence that their bids will have a reasonable opportunity to win a contract for their proposed project's power. Reasonably assured bidders produce lower cost bids, because financing costs are lower when market and regulatory risks are few and well understood. In addition, when renewable energy developers can rely on a fair and predictable planning process they do not raise their prices to cover uncertainties and risks, including delays and potential loss of economies of scale.

15. Colorado's system for electric generation resource planning, including analysis and acquisition, takes place in four year cycles, with resource acquisitions also taking place occasionally on an opportunistic basis as market conditions and federal tax policy create

favorable circumstances. The Colorado Electric Resource Plan review process, anticipated to commence in early 2016, will include review and approval of new resource types in Phase I, generally lasting one year. Thereafter, in Phase II, resources, including new wind and solar projects, will be acquired through competitive bidding resulting in signed contracts within one to two years, with facilities online another year or so after approval.

16. We now expect that PSCo, which is currently contemplating its CPP compliance options, will file a new planning docket at the PUC in early 2016 that will feature another round of competitive bidding in which wind and solar resources will be expected to compete. PSCo's current modeling turns on its projected CPP requirements and participating in trading systems and the CEIP. Renewable energy project developers, the State of Colorado, and Colorado utilities are all actively engaged in CPP planning and discussions that contemplate compliance with the CPP. Renewable industry representatives are already incorporating CPP-driven demand projections into their budgets, plans, and market projections over the next few years. Contrary to the Stay Movants' assertions, Colorado and many western states are poised to provide reliable and cost-effective resources to comply with the CPP. Bracht Decl., ¶2. A stay of the CPP, and specifically of the Clean Energy Incentive Program (CEIP) found within the CPP, would intrude into this very carefully balanced, periodic process and would confound these expectations, create uncertainty, and result in higher risks, and higher costs, resulting in higher cost electricity for consumers.

Colorado's strong renewable energy markets will provide opportunities to comply with the CPP on a timely basis, supervised by the coordinated efforts of the PUC and CDPHE.

17. Colorado stakeholders, with coordination between its air regulators and the PUC, already have the experience of successfully accomplished early retirements of about half of PSCo's aging coal fleet, including implementing the state's 2010 "Clean Air Clean Jobs" ("CACJ") legislation. The CACJ provided for coordinated multipollutant air quality planning to achieve compliance with current and anticipated Clean Air Act measures in light of the substantial emissions associated with coal plants across much of Colorado's electricity system. The PUC and the CHPHE worked in a coordinated manner to meet relevant air quality standards, transition from high emitting to low emitting generation, and to select and construct replacement power plants, in part by using the planning and bidding process described above. Implementing the CACJ policies at least cost to consumers in this manner demonstrates that Colorado stakeholders have experience with achieving cost-effective and system-wide emissions reductions through a flexible approach, and their experience conditions expectations of what CPP compliance will require.

18. Given the successful outcomes of CACJ, most in Colorado anticipate that CPP can also be implemented quickly and successfully, including additional renewable energy acquisitions. The terms of the CPP rules themselves support these expectations. Colorado has already begun a stakeholder process, including holding a recent public meeting where CDPHE representatives described state analysis of the CPP and invited focused comments. This type of coordinated response shows that Colorado and western states can implement emissions reduction programs promptly and efficiently. Gustafson Decl., ¶13; Hyde Decl., ¶¶25, 36; Lloyd Decl., ¶¶6, 82-86.

19. The CPP includes a number of incentives for the use of renewable energy sources to reduce carbon emissions that are animating market expectations, planning, and project development work in Colorado's renewable energy market today. Some of the many ways that the CPP will encourage addition of renewable energy in utility generation portfolios include restrictions on rates or amounts of carbon that can be emitted into the atmosphere by fossil fueled generation plants. These limits will provide an incentive for utility companies to seek out non-emitting generation options, like wind and solar, to replace or supplant fossil fuel generation.

20. The CEIP is a voluntary program under the CPP designed to provide incentives for near-term development of renewable energy sources, as well as certain demand-side energy efficiency projects. The CEIP will reward developers that are able to complete certain eligible renewable energy projects during the two-year period before the Clean Power Plan's compliance period goes into effect in 2022.

21. Under the CEIP, the EPA will provide additional compliance credits to developers of certain types of renewable projects that commence after a state submits a final plan. Specifically, under the CEIP, a developer of an eligible wind or solar power project will receive one emissions reduction credit from the state and one matching credit from the EPA for every two megawatt-hours that the project generates in 2020 or 2021. The EPA will provide matching credits up to an amount that represents the equivalent of 300 million short tons of carbon dioxide emissions. These credits will be tailored to work within the state CPP compliance programs, regardless of whether a state decides to use rate-or mass-based compliance standards.

22. The EPA indicated in the final rule that it intends to reserve a portion of this compliance credit pool for eligible wind and solar projects; however, the EPA has not yet determined how the pool will be allocated. Renewable energy developers provide cost-effective electricity generation resources that Colorado and other western states will acquire to reduce their carbon emissions within time periods available under the CPP.

23. Acquisition of new renewable energy resources to come online during 2020 and 2021 would allow Colorado to gain access to the 300 million short tons worth of emission reduction credit allocations that the EPA has set aside to distribute to states under the CEIP program. Access to these credits would allow Colorado utilities that produce them to trade them to others, to the benefit of Colorado consumers, resulting in lower cost CPP compliance.

24. Colorado has the rules in place, and a history of agency coordination, to benefit from these opportunities within the next few years. A stay of the CPP programs would, in fact, cause unnecessary interruption of this planned stakeholder coordination and would be wasteful of agency resources and valuable opportunities to obtain the credits available under the CEIP.

A stay of the CPP would delay, interrupt, and diminish the Colorado market for renewable energy, harming renewable energy companies, and their suppliers and employees, as well as reducing benefits enjoyed by electric consumers and the citizens of Colorado.

25. As described above, Colorado has the experience using its system of well-developed laws and rules and competitive bidding practices to efficiently analyze and approve acquisition of cost-effective generation resources, including new wind and solar plants. Colorado has begun preparing its state plan, but does not need to submit a state plan or

conduct any interstate coordination before September 2016. States requesting an extension will have until September 2018 to submit final plans either alone or in cooperation with other states. In short, EPA has provided a time period of almost three years for states to prepare plans that implement the Clean Power Plan. This timing works well for Colorado, but must not be delayed to avoid interruption and damage to its stable markets.

26. In Colorado, recent opportunities to acquire renewable energy at low costs have proven that renewable energy can be built and online within a few years. In December, 2010, PSCo filed with the PUC to approve a renewed request for proposals to gain the benefits of reduced wind and solar prices. The process was expedited to take advantage of production tax credits, then set to expire at the end of 2012, with construction required to begin by the end of 2011. Bids were received and analyzed, with PUC approval through a final decision, and a signed contract was executed for a new 100 MW wind plant before the end of 2010. Construction was commenced on a timely basis and the project was online by the end of 2012 (Limon I).

27. Due to the large cost savings available to its electricity consumers from the plunging costs of wind, PSCo again requested approval of an expansion to the newly approved Limon I wind farm in August, 2011. The Commission acted with dispatch, issuing its decision and order, and a signed contract between the utility and developer was in place by the end of November, 2011. That project was also online and producing clean wind power by the end of 2012 (Limon II). When motivated by potential for cost savings and supportive and consistent public policy initiatives, utilities and regulatory agencies in Colorado have acted promptly to test the market, and then analyze and approve new renewable energy resources that benefit

consumers and the state. A stay of the CPP would harm this pattern of success. Delay or stay of CPP implementation would result in more risk, higher prices, and delays of benefits.

28. Colorado has used these processes to complete new energy resource acquisitions to comply with other emissions reduction initiatives under the Clean Air Act and in response to policies determined by the Colorado state legislature. These processes will be successful in obtaining the resources contemplated in the CPP in a cost-effective manner if they can proceed as currently planned. Our state's experience supports our expectations for CPP compliance on a timely basis, contrary to assertions by Stay Movants that it will take years to bring renewable energy online.

29. Based on that logic and experience, wind and solar developers are, in fact, developing projects in Colorado, so projects will be available to bid when resources are requested. Colorado projects are constantly being prepared for opportunities to bid into utility requests for proposals, since these preparations are necessary for developers to meet bid requirements. When renewable developers submit a response to a request for proposals, bidders are required to report resource studies that detail how much wind and solar power is available at their development site. They must show how they will acquire land and development permission for their proposed location. Their interconnection to the electric grid is required to be studied so interconnection costs can be ascertained. Additional transmission lines might be required to move power from the wind or solar project to a utility's point of interconnection, so transmission planning is required. Financing, management, construction, and operations of the project need to be planned and described. The resulting project economics must be calculated so a price for power produced can be bid. All of this work is

required to prepare a project to compete in Colorado's market for new renewable energy projects.

30. Once development activities are interrupted, it is expensive to reinstate these activities, because economies of scale have been disrupted. For example, renewable energy developers must hire and re-train employees with shorter notice, and re-acquire access to equipment and supplies, from sources which may have gone out of business or raised costs due to the lack of a steady flow of business. These inefficiencies raise overall costs, which eventually must be passed on to utility ratepayers in purchase power agreements or acquisition prices.

31. Colorado wind and solar developers are positioning themselves to respond immediately to the submission of state CPP plans. There are at least 300 million short tons of early action credits for renewable projects available to the industry, which could potentially provide incentives leading to hundreds of additional MW of renewable energy in Colorado. Colorado's renewable energy industries are seeking to take advantage of the CEIP program to jump-start Colorado's emissions reductions. These preparations and investments in project development, based on the CPP and the CEIP program, will be harmed if postponed by a judicial stay. If a stay were granted, the date for the state to elect to participate in the CEIP would be significantly deferred. Colorado developers are putting investment in project development at risk now in anticipation that a smooth path to CPP compliance, like the CACJ implementation, will deliver them opportunities to bid for contracts, win them, and develop their projects.

32. A stay would significantly delay the state's ability to benefit from the CEIP. The state's planning process must proceed in a step-wise manner, dove-tailing with the resource planning processes for each of the state's utilities. A stay would interrupt discussions and planning already developing and create confusion between and among the various regulatory agencies. A stay would disrupt and damage these opportunities and the state's renewable energy industry.

Conclusion

33. The Colorado market for renewable energy to be supplied to utilities depends on predictable planning, periodic issuance of utility requests for proposals, responsive competitive bids from renewable energy development companies, and acquisition of approved generation resource portfolios, all supervised by the Colorado PUC. Colorado's experiences, including the large numbers of bids from renewable energy developers in its largest investor-owned utility's recent all-source request for proposals show that developers trust this competitive market to provide them with predictable and fair opportunities to bid their projects with a chance to win a contract for power, on which they can invest in, construct, and operate their proposed generation projects.

34. The Colorado bid process produces opportunities for renewable energy development companies and the firms that supply products and services on which they depend to create and sell renewable energy development projects. This process produces a range of benefits for consumers and for the state of Colorado generally. Recent results from Colorado's competitive market for new renewable energy generation projects show that wind and solar

added to utility generation portfolios provides lower cost of service for consumers than other alternatives. Colorado utilities and solar and wind developers are anticipating a predictable and consistent implementation of the CPP, and of the CIEP within it. Developers are investing in project development in anticipation of smooth CPP implementation in Colorado.

35. A stay of the CPP would delay, interrupt, and diminish the Colorado market for renewable energy, harming renewable energy companies, and their suppliers and employees, as well as reducing benefits enjoyed by electric consumers and the citizens of Colorado.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Denver, Colorado, on this 7th day of December, 2015.



_____

Ronald L. Lehr

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF ANDREA LUECKE

I, Andrea Luecke, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Response in Opposition to Petitioners' Motions for Stay by Proposed Respondent-Intervenor Solar Energy Industries Association ("SEIA").

2. I am the Executive Director of the Solar Foundation. I have served in that position since August 2010.

3. The Solar Foundation is a national 501(c)(3) nonprofit organization. The mission of the Solar Foundation is to increase understanding of solar energy through strategic research and education that transform markets.

4. The Solar Foundation supports the overall objective of achieving meaningful CO_2 emission reductions from existing power plants and encouraging

investment in a clean energy future, while maintaining electric system reliability. The Clean Power Plan is a reasonable and balanced approach to reducing CO_2 emissions from the electric generating sector that is consistent with the Clean Air Act and EPA's implementing regulations.

5. According to The Solar Foundation's National Solar Jobs Census 2014, the solar industry continues to exceed growth expectations, adding workers at a rate nearly 20 times faster than the overall economy and accounting for 1.3% of all jobs created in the U.S. over the past year. Solar industry employment has grown by 86% in the past five years.

6. As of November 2014, the solar industry employed 173,807 workers, representing a growth rate of 21.8% since November 2013, in all 50 states and the District of Columbia. Employers surveyed expected to see total employment in the solar industry increase by 20.9% to 210,060 workers over the 12-month period between November 2014 and November 2015.

7. As of November 2014, the solar industry employed nearly twice as many workers as the coal mining industry, which employed 93,185 workers.

8. Wages paid to solar workers are competitive with similar industries and provide many living-wage opportunities. Solar installers pay an average wage of $20-24 per hour, manufacturers pay their assemblers nearly $18 per hour, and internal sales professionals at these firms earn approximately $44 per hour. Overall, salespeople have a wide range of pay, from about $30 to more than $60 per hour, and solar designers earn between $30-40 per hour.

9. As of November 2014, the deployment of each megawatt of new

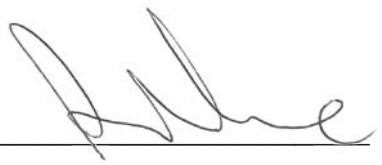
generating capacity from solar employed about 15.5 workers or roughly 20 to 25 times more jobs than a megawatt of capacity from the country's existing fleet of coal-fired power plants and its supporting extractive and transportation infrastructure. This represents the potential for a significant net increase in the size of the U.S. electricity generation workforce as traditional fossil fuel sources, such as coal, are supplanted by solar and other renewable energy sources as a result of the Clean Power Plan.

10. The vast majority of jobs created by the solar industry as a result of the deployment of new generating capacity are geographically diverse and spread across each of the 50 states. These jobs are limited only by demand and not to specific geographic regions based on the natural occurrence of a particular resource, such as coal miners in West Virginia, Kentucky, or Wyoming. To illustrate this point, three of the five states with the highest levels of solar employment in 2014 – Massachusetts, New York, and New Jersey – experience relatively low levels of solar irradiance.

11. Granting a stay of any incentive program that enhances the market for solar energy, such as the Clean Power Plan final rule, would slow job growth in the solar industry if investments in new solar generation are delayed as a result of a stay.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed at Washington, DC, on December 2, 2015.



Andrea Luecke

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al*. Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF COLIN MEEHAN
ON BEHALF OF FIRST SOLAR, INC.

I, Colin Meehan, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of the Advanced Energy Economy ("AEE") and Solar Energy Industries Association's ("SEIA") Response to the Motion for Stay from various Petitioners.

2. I am Director of Regulatory and Public Affairs for First Solar, Inc. ("First Solar"). I have served in that position since June 2, 2014.

3. As Director of Regulatory and Public Affairs at First Solar, I manage

local, state and federal regulatory matters that may impact First Solar's business. In that capacity, I provide information to regulators, legislators, and other public policy decision makers about policies and regulations relating to wholesale power markets that affect First Solar's business. I also support First Solar's development of utility-scale solar photovoltaic ("PV") projects at the state, local, Regional Transmission Organization ("RTO") and federal levels, which includes advocating the adoption of policies that facilitate procurement from renewable energy resources and that enable construction and interconnection of utility-scale solar generating facilities.

4. First Solar is a leading global provider of comprehensive PV solar systems that use its advanced module and system technology. First Solar's integrated power plant solutions deliver an economically attractive alternative to fossil-fuel electricity generation today. From raw material sourcing through end-of-life module recycling, First Solar's renewable energy systems protect and enhance the environment.

5. First Solar is headquartered in Tempe, AZ with offices throughout the U.S. and around the world. First Solar has significant marketing, distribution, and manufacturing operations both within and outside the United States. Currently, First Solar manufactures solar modules in Perrysburg, Ohio, and Kulim, Malaysia. As of December 31, 2014, First Solar had approximately 6,060 full and part-time employees, including approximately 4,320 in module manufacturing positions and approximately

550 who work directly in First Solar's systems business.

6. First Solar was incorporated in February 2006. First Solar's common stock has been listed on the NASDAQ Global Select Market under the symbol "FSLR" since an initial public offering in November 2006. Since that time First Solar has expanded to become a leading solar manufacturer and installer, celebrating a major milestone in early 2015 of 10 gigawatts ("GW")[1] of First Solar modules installed globally. This achievement highlights First Solar's expanding global reach and the increasing worldwide demand for solar energy.

7. First Solar is a member of Advanced Energy Economy ("AEE") and our goal to expand our business in the U.S. through opportunities to develop, construct and operate utility-scale solar power plants aligns with AEE's goals to expand business opportunities for providers of advanced energy solutions, including renewable energy generation.

8. First Solar has also been a member of the Solar Energy Industry Association ("SEIA") since 2006. Currently, First Solar is a member of the SEIA Board of Directors and serves on the executive committee of the Board. I personally serve as Chair of the SEIA Clean Power Plan Committee as well as Chair of the SEIA Committee for the Southeastern U.S.

[1] One gigawatt is a unit of power equal to a billion watts. First Solar's 10 gigawatts of installed capacity produces an estimated 14,000 gigawatt hours (GWh) a year. This is equivalent to the annual energy consumption of the city of Washington, D.C.

9. In the last five years, the solar industry has grown dramatically in the U.S., allowing utility scale PV project developers to gain efficiencies from "learning by doing" that have further reduced the already relatively short construction time for utility-scale PV when compared to conventional thermal Electric Generation Units ("EGU") construction timelines. In 2010, 987 megawatts ("MW") of utility-scale PV capacity was operational in the U.S.;[2] by the end of 2014, the total installed capacity of utility-scale PV was estimated to exceed 10,000 MW.[3][4]

Utility-Scale Solar PV Supports Energy Reliability

10. Contrary to the declarations submitted in support of the Motions for Stay, increasing the amount of electricity generation from solar power will not adversely affect the reliable operation of the electric grid.

11. According to a report of the National Electric Reliability Commission ("NERC"):

> The assessment shows that […] emerging resources [including solar generation] offer the potential to support the flexibility-related reliability functions that in turn will support high levels of variable generation. While many of these resources have not yet been applied to providing these reliability functions, the limitations for doing so are not technical but rather commercial or policy-related.[5]

[2] EIA Form EIA-923
[3] EIA Forms EIA-923, 860
[4] EIA Forms EIA-923, 860
[5] M. G. Lauby et al., "Balancing Act," *IEEE Power Energy Mag.*, vol. 9, no. 6, pp. 75–85, Nov./Dec. 2011.

12. In the U.S., the California Independent System Operator ("CAISO") and Electric Reliability Council of Texas ("ERCOT") have successfully adopted updated operations and planning practices to accommodate increasing volumes of variable renewable energy resources, such as wind and solar, in their balancing areas. In addition to developing high voltage transmission Competitive Renewable Energy Zones, ERCOT has revised system processes to improve wind and solar output forecasting and incorporate generation from variable energy resources into real-time and day-ahead markets. New rules and system improvements have resulted in increased wind generation and dispatch in the ERCOT service area.[6] California has implemented similar improvements to assist the expansion of variable energy resources such as forecasting when variable sources can provide voltage support and implementing a six state Energy Imbalance Market to improve the integration of renewable resources throughout the region.[7]

13. Moreover, solar PV generating facilities can be configured and operated to provide reliability and transmission services that actually *improve* the reliability of electric power grid operations. For example, with the proper programs and incentives

[6] Such examples include running the real-time market every 5 minutes instead of 15, implementing ramp restrictions, and requiring VERs to provide primary frequency response to support expanded solar generation. ERCOT Presentation: "FERC Conference on Increasing Real-Time and Day-Ahead Market Efficiency through Improved Software June 23-25, 2014

[7] CAISO "Benefits of Participating in EIM," February 11, 2015

in place, utility-scale solar PV generating facilities are capable of providing advanced ancillary services that enable these projects to operate more like conventional power plants and to contribute actively to the stability and reliability of a regional grid as part of a balanced energy portfolio.[8] These capabilities can be achieved through the use of a plant-level controller specifically engineered to regulate real and reactive power output of the solar facility such that it behaves as a single large conventional generator.[9] These advanced features can enable solar PV to provide a state or region with additional system flexibility by responding to utility and independent system operator instructions.

14. A number of studies sponsored by NERC have concluded that reliability should be viewed as a management issue rather than a technical limitation in integrating a large volume of variable energy resources.[10] Far from concluding that increased penetration of variable energy resources will destabilize grid operations, the studies recognize that grid stability can be maintained, and provide various recommendations for planning and operational practices, methods and resources

[8] These services include voltage regulation, active power controls, ramp-rate power controls, fault ride-through, and frequency response controls. "The Role of Utility-Scale Photovoltaic Plants in Grid Stability and Reliability," Morjaria *et al.*, IEEE Power & Energy Magazine, May/June 2014, p. 87

[9] According to a study from Lawrence Berkeley National Laboratories, applying this type of aggregation to 23 sites reduces the amount and magnitude of intermittency by 84% over 1 minute and 69% over 1 hour.

[10] In addition to those cited in this section, M. G. Lauby et al., "Balancing act," IEEE Power Energy Mag., vol. 9, no. 6, pp. 75–85, Nov./Dec. 2011.

needed to integrate variable generation resources into the bulk power system reliably.[11]

15. Utility-scale PV installations generally use high-speed digital power electronics technology, which has the potential to revolutionize the way the short-term grid stability and reliability concerns are addressed. Grid operators are also using improved forecasting of variable generation[12], as well as adopting appropriate market mechanisms to support the use of advanced electronics in grid operations and reliability services.[13] These developments further demonstrate that concerns related to the integration of renewable energy and grid reliability may be technically resolved through the effective management of resources and technology that are currently available and already deployed in several operating regions.

Utility-Scale PV is Increasingly Cost-Competitive with Conventional Technologies and Will Help Lower Energy Costs

16. It has been reported that utility-scale PV costs have declined 82% since 2009.[14] Although current clearing prices for utility scale PV generating facilities are

[11] R. Piwko *et al.* 2012. "Special reliability assessment: Interconnection requirements for variable generation." (NERC)
[12] Ahlstrom, M et al., "Atmospheric Pressure," *IEEE Power Energy Mag.*, vol. 9, no. 6, pp. 97–107, Nov./Dec. 2011.
[13] ERCOT Future Ancillary Services
[14] Lazard, "Lazard's Levelized cost of Energy Analysis – Version 9.0," November, 2015, p. 10

likely lower today than what is reported publicly,[15] even publicly available data demonstrates that utility-scale PV installations are now cost- competitive with new coal or natural gas generation units.[16] A confluence of factors, including economies achieved through scale, technology and efficiency improvements and increased competition, enabled by federal, state & local policies, have combined to drive down costs.

Executed at Austin, Texas, on December 6, 2015.



Colin Meehan

[15] Prices for most recently executed contracts are confidential according to the contract terms or to regulatory approval processes, and therefore, publicly reported data by definition does not reflect all contracts or the most recent pricing occurring in the market today. However, clearing prices have consistently demonstrated a downward trend over the last decade and recently published prices, remain consistent with that overall trend.

[16] Lazard, "Lazard's Levelized cost of Energy Analysis – Version 9.0," November, 2015, p. 2

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, *et al.*, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF MICHAEL MENDELSOHN

I, Michael Mendelsohn, declare as follows:

1. I am the Senior Director of Project Finance & Capital Markets at Solar Energy Industries Association (SEIA), where I organize and run a variety of activities to open investment for solar project deployment. I hold a BA in Computer Science from Ithaca College, and an MS in Energy Management and Planning from the University of Pennsylvania.

2. I have worked for 25 years in the energy industry with particular focus on power and gas markets, utility regulation, and solar securitization. I have worked as an economist with the Massachusetts Department of Public Utilities, a consultant with the Boston-based consultancy of Levitan & Associates, Inc., and as a financial analyst with the National Renewable Energy Laboratory (NREL). While at NREL, I organized the solar, investment bank, legal, engineering,

accounting and other industries to facilitate wide-scale investment in solar asset cash flows via asset-backed securitization and other investment vehicles. That effort – called the Solar Access to Public Capital (SAPC) working group – organized 500 entities to standardize contracts, develop public datasets, and implement other innovations designed to reduce finance-related transaction costs and facilitate the pooling of project cash flows into highly liquid and tradable securities preferred by pension funds and other large managers of investment capital.

3. My responsibilities at SEIA include opening new sources of investment such as real estate, local and regional banks and credit unions, and capital markets, and underserved sectors of the solar economy such as low-moderate income households and the large majority of businesses who lack rated credit. My declaration is based on my direct experience as a professional responsible for analyzing and organizing markets.
4. I am supplying this declaration on behalf of SEIA.
5. The purpose of my declaration is to provide information to the court relating to the question of whether renewable energy investments might suffer harm if a stay were granted of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").
6. In preparation for this declaration, I have become familiar with the Clean Power Plan and declarations submitted in support of Petitioners' requests for a stay. I am acquainted with the other documents cited in this declaration.

7. SEIA is concerned about the negative impacts that a stay would have on solar energy development in the United States.

8. Solar energy is a major contributor to the U.S. energy infrastructure and represents a source of energy that is emission-free, has very low operating cost, consumes very little fresh water, and is easily deployed across residential, business and non-profit rooftops and ground-mount systems. As of the end of September, 2015, the U.S. has an installed solar capacity of 22,440 MW_{dc} of photovoltaics (with 6,300 MW_{dc} of solar system capacity deployed in the last year alone) plus another 1,685 MW_{ac} of concentrating solar power plants currently in operation.[1] A new solar project is installed every two minutes in the United States. The number of installations in 2016 is projected to be nearly double the number of 2014 installations.

9. Solar projects have in 2013 were valued at $13.7 billion, compared to $11.5 billion in 2012 and $8.6 billion in 2011. These investments were made by domestic and foreign financial institutions (e.g. banks, insurance companies, etc.), energy companies, other corporations, and hedge funds. A stay of the Clean Power Plan would create significant business and investment uncertainty. This uncertainty could result in redirecting investments that otherwise would be made in solar projects toward other sectors, thereby harming the domestic renewable energy industry by making it more difficult to find affordable project-level debt and equity, including construction loads, project debt, and project equity. This investment is essential to developing, constructing, and operating solar projects,

[1] SEIA and GTM Research "U.S. Solar Market Insight Q3 2015."

including those with signed power purchase agreements.

10. As of the end of 2014, the U.S. solar power industry supports employment of 174,000 people in installation/construction, project development, manufacturing, plant operations, and research and development. Solar power supports jobs in all 50 states. At the same time, the cost of solar energy has decreased by about 85% over the past seven years.[2] These developments, including other factors, have increasingly focused investors on renewable energy.

11. The Clean Power Plan is a significant incentive for the U.S. to continue the transition to renewable and other clean energy sources. Uncertainty caused by a stay regarding the Clean Power Plan could affect the solar financing investment market because the Clean Power Plan provides a market signal to further the maturation of the solar and other renewable energy industries.

12. Decreased or slowed access to financing would cause significant harm to the solar industry.

13. The Clean Power Plan will improve the financing environment for solar projects, which will in turn lower the cost of clean solar energy and induce capital market investment and similar financial vehicles. The Clean Power Plan, including the Clean Energy Incentive Program (CEIP), will facilitate consistency, transparency and liquidity among a critical revenue source for solar projects. This revenue represents the monetization of the valuable environmental benefits solar and

[2] "Lazard's Levelized Cost of Energy Analysis – Version 9.0" November 2015, pages 2 and 10. https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf

other clean energy resources provide – a critical economic recognition necessary to combat climate change.

14. The Clean Power Plan builds on the achievements of existing state renewable energy policies. These policies provide market certainty by allowing developers to plan project development, allowing financial institutions the certainty needed to finance project development, and allowing states to make prudent energy investment that leads to the lowest cost and greatest benefit to ratepayers.

15. Currently, as many as 17 states are engaging in stakeholder processes to plan for Clean Power Plan compliance. As part of these processes, states are considering whether to maintain current renewable energy policies, change existing policy, or adopt new policies, as a cost-effective means of compliance with the Clean Power Plan. For example, many states are considering whether to increase their renewable energy requirements under existing state renewable portfolio standards. However, until states decide whether to implement policy changes, such as increases in renewable portfolio standards, developers, financiers, and utilities may delay investment decisions. The longer this process takes, the more expensive and difficult it will be to deploy renewable energy for Clean Power Plan compliance. This will lead to higher project development costs, transaction costs, and higher compliance costs for states.

16. An early incentive component of the Clean Power Plan, the CEIP, is designed to incentivize near-term development of renewable energy sources, as well as certain demand-side energy efficiency projects. The program will reward developers that are able to complete construction of certain eligible renewable

energy facilities during the 2020-2022 period.

17. Under the CEIP, the EPA will provide additional marketable emission credits to developers of certain types of renewable projects on which construction is commenced after a state submits a final plan. Specifically, under the CEIP, a developer of an eligible wind or solar power project will receive one emissions reduction credit from the state and one matching credit from the EPA for every 2 megawatt-hours that the project generates in 2020 or 2021. Emission reduction credits will have economic value to the CEIP developer, because they will be saleable for compliance to fossil fuel-fired generators that have emission reduction obligations under the Clean Power Plan.

18. Information provided by the EPA to date on the CEIP suggests that the program will provide a meaningful incentive for renewable project developers to undertake new projects in participating states. Developers are already engaging the EPA and state policy makers to ensure that the program is designed and implemented to increase early investment in renewables.

19. If a stay of the Clean Power Plan regulations were granted, the date for a state to elect to participate in the CEIP would be significantly deferred. A postponement of the date on which states indicate whether they want to participate in the CEIP could have serious consequences for renewable energy investment. Emission credits are available only for renewable projects that (1) commence construction after the submission of a final state plan; (2) only after the project actually begins to generate electricity; and, (3) only during the 2020-2022 period. A stay would create investor uncertainty about the ability of projects to earn credits that could

delay or prevent investments as the prospect of credit creation dwindled. Project developers and other industry participants would also be harmed because a delay would lessen the amount of time they would have to prepare to become eligible.

20. In addition, if a stay lasted through much of 2016, as seems likely, financing would become more difficult after the stay was lifted even if the court ultimately endorsed the Clean Power Plan. The reason is that the Federal Investment Tax Credit for solar generation steps down from 30 percent to 10 percent by December 31, 2016.[3] A lower Investment Tax Credit will limit the ability to raise the necessary investment to develop solar projects. Accordingly, the role of the CEIP, particularly in facilitating investment capital for solar deployment, will be that much more important. Thus the uncertainty caused by a stay could be expected to cause significant delay or cancellation of investments in solar installations that would otherwise have been made.

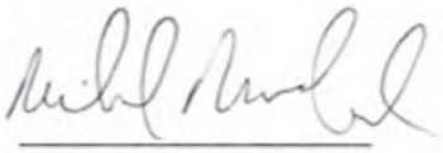
21. The renewable energy industry is already ramping up to meet increasing demand. As the Federal Investment Tax Credit for commercial solar phases down from 30% to 10% by the end of 2016, the Clean Power Plan provides support for the growing solar industry and certainty for businesses and states that the renewable energy industry will continue to grow. A stay could undermine that certainty among potential buyers, who may put decisions on hold pending more policy certainty. For example, a stay could affect financier efforts to invest in these

[3] Existing law provides for a 30% investment tax credit, which effectively accounts for 30% of the capital cost of a solar generating facility. Decreasing or phasing out the ITC will limit access to capital markets and raise the cost of capital.

renewable energy projects as well as developer efforts to negotiate Power Purchase Agreements over the next couple of years.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 3rd day of December, 2015, in Boulder, CO.



Michael Mendelsohn

ORAL ARGUMENT NOT YET SCHEDULED

No. 15-1363 and Consolidated Cases
(15-1364, 15-1365, 15-1366, 15-1367, 15-1368, 15-1370, 15-1371, 15-1372, 15-1373, 15-1374, 15-1375, 15-1376, 15-1377, 15-1378, 15-1379, 15-1380, 15-1382, 15-1383, 15-1386, 15-1393, 15-1398, 15-1409, 15-1410, 15-1413, 15-1418, 15-1422)

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

WEST VIRGINIA, et al.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY
AND REGINA A. MCCARTHY, ADMINISTRATOR,

Respondents.

DECLARATION OF JIM ROTH

I, **Jim Roth**, hereby declare under penalty of perjury as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors and am supplying this declaration at the request of movant-intervenors the American Wind Energy Association ("AWEA").

2. I am currently an attorney at Phillips Murrah, where I serve as Director and Chair of the Clean Energy Practice Group. I have served in that position since

January 2009. I was appointed to serve as an Oklahoma Corporation Commissioner in 2007 and stayed on the commission until 2009.

3. I also serve on the Advisory Board for The Institute for Energy Law, as a Board Member to The American Clean Skies Foundation, and as a Board Member for TexCom. I have a J.D. from Oklahoma City University, a B.A. from Kansas State University, and am a graduate of Harvard University's John F. Kennedy School of Government, United States Air War College's National Security Forum, and The Institute of Public Utilities at Michigan State University.

4. The purpose of my declaration is to provide information to the Court relating to the question of whether states or other parties will suffer irreparable harm absent a stay of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

5. Portions of my declaration are based on my direct experience as a former state official responsible for implementing state and federal statutes and regulations and deciding state matters related to electric utilities and power plants. Among many other things, my state service included responsibility for overseeing energy, environmental, and oil and gas issues.

6. I am familiar with EPA's Clean Power Plan, the subject of this litigation. Based on my former role as a Commissioner on the Oklahoma Corporation

Commission and in my current role as a regulatory practitioner before the current Oklahoma Corporation Commission, I have the personal knowledge and experience to understand what steps the State of Oklahoma will need to undertake to implement the Clean Power Plan, including preparation of a state plan. While on the Oklahoma Corporation Commission, my work intimately involved me in the implementation of utility and environmental statutes and regulations by state governments, as well as reliability issues related to the electric industry.

7. In my experience, many of the assertions made by the State of Oklahoma's declarant, Brandy Wreath, overestimate and misstate the duties and burdens that will be imposed on the Oklahoma Corporation Commission by the Clean Power Plan.

The Oklahoma Corporation Commission Will not be Required to Devote Significant Time and Resources to Create a State Plan in the Immediate Future

8. The assertion that the Oklahoma Corporation Commission "is currently expending substantial resources-in terms of money, personnel, effort, and administrative focus-to comply with EPA's regulations for existing power plants," Wreath Decl. ¶ 2, is unfounded. In my experience on the Oklahoma Corporation Commission, Oklahoma's regulators, as well as other states, have consistently been able to effectively and efficiently discharge the duties placed on them as part of the cooperative relationship embodied in federal statutes,

such as the Clean Air Act. The staff of the Oklahoma Corporation Commission has the skill and capacity to continue to accomplish these duties for the State of Oklahoma.

9. Based on my review of the Clean Power Plan, the preparation and planning that the Oklahoma Corporation Commission will be required to conduct under the Clean Power Plan during the pendency of this litigation will not significantly exceed the planning duties that are often conducted by the agency in accordance with other federal or state rules.

10. While the movants assert that Oklahoma Corporation Commission staff is currently overburdened by working with the Southwest Power Pool, which is the regional transmission organization for Oklahoma and surrounding states, to evaluate transmission infrastructure projects that will be necessary to accommodate compliance with the Clean Power Plan, *see* Wreath Decl. ¶¶ 2-3, employees at the commission typically engage in extensive work with the Southwest Power Pool on transmission-related activities and would be regardless of this rule.

11. Under the Clean Power Plan, Oklahoma is afforded ample time to develop a state plan. Oklahoma is not required to submit a state plan or conduct any interstate coordination before September 2016. The initial submission required in September 2016 requires a minimal amount of effort and planning by state authorities. EPA has provided until September 6, 2018 – a time period of

almost three years - for states to prepare plans that implement the Clean Power Plan. Based on my experience, this should be more than sufficient.

12. To the extent any costs associated with creating a state plan will occur over the next year or so, regulatory compliance with federal rules is an integral responsibility of the Oklahoma Corporation Commission, as well as other state commissions. Accordingly, the costs and staff required by these compliance duties are factored into the agencies' annual budget and staffing plans. Creating a state plan under the Clean Power Plan falls within these typical, ongoing compliance duties.

13. Although the Declarant for the State of Oklahoma depicts the rulemaking process as complex, *see* Wreath Decl. ¶ 15, Oklahoma can prepare its Clean Power Plan implementation plan using the same process that has proven successful for other programs. In light of the Oklahoma Corporation Commission's knowledge and experience, the agency will have ample time after EPA approves its plan to meet the 2022 interim compliance deadline. EPA is required to approve or disapprove a state plan within 12 months of submission—at the latest, September 2019.

14. The final rule provides ample flexibility and a wide range of compliance paths to fit states' varying generation mixes and regulatory structures. Emissions trading, often cited by economists as the most cost-efficient emissions reduction measure, are favored by the plan and are part of the federal

implementation plan that Oklahoma, as well as other states, can choose to adopt instead of developing and submitting its own plan.

15. An Oklahoma plan could adopt an emission trading program in order to ensure its electric generating units comply with the Clean Power Plan. As such, the rule would not require that the state legislature grant the Oklahoma Corporation Commission new powers. Oklahoma will not, as movants assert, need authority to mandate the construction of power plants, require electric generating units to enter into power purchase agreements, or otherwise direct the actions of existing generators.

16. A properly structured emissions trading program could integrate seamlessly with the regional competitive electricity markets and provide appropriate economic incentives for electric generating units to reduce emissions — without any need for central planning or direction from the Oklahoma Corporation Commission. Under the Clean Power Plan, electric generating units will continue to make decisions about the amount and type of generation to construct and operate, given a wide array of economic and regulatory considerations.

17. Oklahoma has also completed other complex administrative proceedings in fewer than a couple of years. Soon after I began my tenure as a Commissioner on the Oklahoma Corporation Commission, we undertook numerous regulatory analyses and initiatives, including the establishment of energy

efficient requirements in the electricity sector, Oil and Gas advancements surrounding unconventional production and deep, horizontal well development, federal pipeline safety studies and numerous other complex undertakings. These processes were initiated and completed timely, often with large, disparate constituencies, evidentiary and judicial analyses in some instances and were successfully shepherded by competent, committed Commission staff in much less than two years from start to finish.

18. Contrary to assertions that state planning for the Clean Power Plan would require burdensome coordination among state agencies, interaction among agencies is already routine. As a Commissioner on the Oklahoma Corporation Commission, I observed significant collaboration between state agencies on a wide range of issues, such as the Oklahoma Department of Environmental Quality with recent federal environmental regulations and the Oklahoma Departments of Transportation and Public Safety to reform and revamp all motor carrier weight enforcement issues across Oklahoma highways. There is also a very strong working relationship among public utilities' commissioners in the region, facilitated by organizations such as the Southwest Power Pool Regional State Committee.

19. One of the objectives of the Oklahoma Corporation Commission in discharging its duties as the energy regulator is to provide a clear path forward for market participants in the form of regulatory certainty. Oklahoma will

therefore seek public input and engage in a planning process regarding the state's implementation of the Clean Power Plan. A stay of the Clean Power Plan would derail this process, further prolonging market uncertainty and hindering the ability of affected business in Oklahoma from making informed investment decisions.

Oklahoma Has Readily Available Opportunities for Fulfilling the Clean Power Plan

20. Existing electric generating units in Oklahoma are extremely well-positioned to comply with the Clean Power Plan due to the state's investments in renewable energy, energy efficiency, and other clean energy programs. For example, the state already has mechanisms in place to increase the deployment and utilization of renewable energy and the development market for such resources is robust.

21. The clean energy resources that state programs have already helped deploy will continue to reduce emissions from existing electric generating units in the years ahead. To the extent that these clean energy measures have displaced and continue to displace fossil fuel-fired generation, these clean energy resources are already causing overall emissions and fossil generation to be lower than they otherwise would be. Additional clean energy resources, such as wind energy and solar energy, that have and are being been developed since 2012, and will

continue to be developed through 2030, will also assist owners and operators of existing electric generating units in complying with Clean Power Plan.

22. Oklahoma has the resources and ability to dramatically increase renewable energy generation. Wind energy has historically been the renewable resource chosen to meet renewable standards requirements in Oklahoma, driving economic development in the state as a result. Oklahoma has tremendous potential for wind energy. Oklahoma already has an installed wind capacity of 4,330 MW MW and has 1,199 MW under construction. The state ranks fourth in the nation for installed wind capacity. The DOE Wind Vision scenario projects that Oklahoma could produce enough wind energy by 2030 to power the equivalent of 1.9 million average American homes. Land-based technical wind potential at 110 m hub height would be 367,984MW.

23. The assertion that "constructing and integrating new capacity is a years-long process [so Oklahoma must] begin carrying out EPA's commands at this time," Wreath Decl., ¶¶ 3, 15–16, 19–22, is totally unfounded. Based on my experience, renewable energy projects generally have a much shorter lead time from permitting to generation, relative to fossil fuel electric generating units and other types of electric generating units. If wind turbines and other large project components have been ordered and preliminary site work has been completed, the time required for on-site construction can be as short as a few months. Most wind project financing, including equity and debt, is typically

arranged late in the development cycle after all of the following approvals have been obtained and the decision to proceed to construction has been made. Moreover, in nearly all cases, the wind project developer arranges financing, and therefore, the utility purchaser is not responsible for any costs until a PPA is signed or a deal to purchase the wind project is closed. What's more, Oklahoma's wind-rich corridor has attracted such strong investment that wind energy projects are occurring at an aggressive rate and available megawatts will likely surpass its load needs for compliance with the Clean Power Plan.

24. Near-term planned transmission to support large additional renewable energy build out is already in place or soon will be. Many lines in Oklahoma have been recently constructed, are currently under construction or have received all necessary permits. As the former Oklahoma Secretary of Energy Mike Ming recently said, "Not only can we build projects economically — and getting more so all the time — but those projects can get their power injected into the grid. . . . The Southwest Power Pool planning process put us way ahead." For instance, Oklahoma Gas and Electric Co. recently constructed a transmission line from Woodward (a renewable-rich area) to central Oklahoma. This Woodward-Tatonga-Northwest 345 kV line, connecting the Woodward area to the Oklahoma City load center, also has a second circuit planned to be online by 2021, right in time for the Clean Power Plan. In addition, American Energy

Power's Elk City-Chisholm 345 kV line is to be completed in 2018, accessing wind renewable resources in Southeast Oklahoma.

25. Each of the utilities in Oklahoma has teamed up with wind farms, solar companies, and more to ensure incorporation of alternative energy sources in the generation of electricity in Oklahoma. The Oklahoma Energy Security ("OES") Act, effective November 1, 2010, was codified in the Oklahoma Statute Title 17 §§801.1-7. The OES Act establishes a goal that 15 percent of all installed electric generation capacity within the state of Oklahoma be generated from renewable energy sources such as wind, solar, photovoltaic, hydropower, hydrogen, geothermal and biomass by the year 2015. Oklahoma has already surpassed this goal well ahead of schedule.

26. The OES Act directs the Oklahoma Corporation Commission to notify the legislature annually of the progress made to reach the goal of 15 percent of electricity to be generated from renewable energy sources. The cCommission calculated the total amount of electricity generated in Oklahoma from renewable energy for 2014 as 20.85 percent (in excess of the original goal). This increase in renewable energy generation is largely due to four new wind farms coming online in 2014 for a total of 648 MW.

27. Oklahoma's renewable energy resources, especially wind power, has proven often to be the best-cost resource for utilities in other states to use as part of their generation portfolios for consumers. For example, Alabama, Kansas,

Nebraska, Georgia, Colorado, New Mexico, Arkansas and Texas currently purchase electricity generated by Oklahoma's wind.

28. Oklahoma would not need to modify its existing clean energy programs, such as the OES Act, in order to comply with the Clean Power Plan. Electric generating units in Oklahoma could utilize existing or soon-to-developed renewable energy to meet Clean Power Plan requirements without any change to existing programs. Any changes to existing programs would be entirely optional and would not need to be implemented, or even considered, during the period of litigation. To the extent that Oklahoma chose to make any amendment to an existing program, such as extending the end date for the OES Act, that could easily be done as a complement to its state plan to comply with the Clean Power Plan and would not need to be done formally in the plan.

The Clean Power Plan Will not Alter The Oklahoma Corporation Commission's Traditional Roles

29. Based on my experience, the Clean Power Plan would not substantially change the Oklahoma Corporation Commission's traditional role of overseeing utility investments, reliability, and electric rates.

30. Oklahoma power companies participate in wholesale markets operated by Southwest Power Pool, and regulated by the Federal Energy Regulatory Commission. Under emissions trading programs for carbon pollution, owners of electric generating units would incorporate the costs of obtaining emission

credits or allowances into the bids that are used to set the energy market clearing price and determine the dispatch order in the Southwest Power Pool real-time and day-ahead energy markets. The Oklahoma Corporation Commission, which does not oversee the wholesale electricity market, would not incur no administrative burden in connection with bids submitted into the wholesale market.

31. The Oklahoma Corporation Commission does not determine environmental compliance strategies for Oklahoma electric generating units under this competitive market structure. It would be up to owners and operators of Oklahoma electric generating units to determine how best to comply with environmental requirements. Owners and operators could choose whether to upgrade their plants to reduce carbon emissions, purchase emissions allowances, or retire. No ratemaking proceeding under Oklahoma's authority would be necessary in advance of compliance.

32. Although the Declarant for the Oklahoma Corporation Commission depicts the rulemaking process as immediately impacting costs and reliability, *see* Wreath Decl. ¶¶ 3, 7, 23 ("[i]f the OCC does not take immediate action, utilities would be unable to account the loss of capacity caused by the Rule, electricity prices would spike, and outages would be routine"), the declaration offers no support whatsoever to back up these unfounded claims. As the rule would likely require Oklahoma to partially move away from reliance on fossil fuels, it

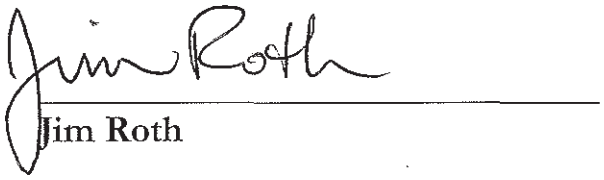
would actually increase the fuel diversity of the state. In addition, renewable energy provides fuel price stability and protects against fuel price risk caused by over-reliance on fossil resources.

33. Oklahoma has a robust, multilayered system to maintain electric reliability that will continue to serve the state's electricity consumers during the implementation of the Clean Power Plan. The Oklahoma Corporation Commission holds hearings and performs investigations pertaining to reliability for resource adequacy and is authorized to require utilities to build new electric transmission infrastructure.

34. The Southwest Power Pool, which serves the entire State, directs reliability by, among other things, monitoring the transmission system and by assuring compliance with the national reliability standards approved by the Federal Energy Commission. In the recent past, Southwest Power Pool has moved swiftly to reinforce the reliability of the Oklahoma electric grid. Utilities now must meet rigorous requirements pertaining to planning, staffing, and other areas to maintain reliability, and are subject to penalties if they fail to do so. In addition, Southwest Power Pool maintains a forward-looking capacity market that is designed to ensure sufficient generating capacity is available to meet demand several years in advance. These overlapping institutions and processes will continue to be available to protect reliability going forward as the Clean Power Plan is implemented.

35. The assertion that utilities must engage in recovery hearings in the coming months and, in turn, these costs will be passed on to ratepayers, *see* Wreath Decl. ¶ 9 (predicting multiple requests for recovery hearings within the next months and that related costs will be passed to ratepayers), is also unfounded. It seems inconceivable that utilities would already be making decisions and engaging in recovery hearings to determine which expenditures they may charge to ratepayers related to the Clean Power Plan based upon conjecture about what the Oklahoma state plan ultimately may entail, which is not due until September 2018.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.



Jim Roth

DECLARATION OF JASON SIMON ON BEHALF OF ENPHASE ENERGY, INC.

I, Jason Simon, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am the Director of Policy Strategy at Enphase Energy, Inc. ("Enphase Energy"). I submit this Declaration in support of proposed intervenor-defendant Advanced Energy Economy's (AEE's) brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan").

2. Among other things, Enphase Energy designs and manufactures power equipment, called "smart inverters," that intelligently converts the direct current power produced by solar panels, storage devices and other electric equipment into alternating current and power quality services, enabling the energy and services to supply the electricity grid.

3. My duties at Enphase Energy include developing and recommending federal and state policies that further the adoption of advanced energy technologies in a cost-effective and reliable manner that serves energy customers well, and is fair to all stakeholders.

4. Our mission at Enphase Energy is to drive consumer adoption of advanced energy technologies that lower energy bills, decrease greenhouse gas ("GHG") emissions, and provide grid-reliability services to utilities. The technology we develop and sell in over 80 countries supports a growing employment base of both green-collar and white-collar jobs. Our product is good for the environment, the electricity grid, and the U.S. economy.

5. Enphase Energy is a member of AEE, an association of a growing base of national and international companies that develop and promote technologies for the 21st century electricity grid, including several Fortune 10 companies.

6. As a technology provider that sells energy management systems which use renewable technologies to provide cost-effective grid reliability services, Enphase Energy has demonstrated that grid reliability need not be compromised as renewable energy penetration increases, if the proper technologies are utilized. In fact, in Enphase Energy's experience, advanced technologies can enhance energy reliability, and avoid increasing infrastructure costs.

7. The nation's existing local energy grids, called "distribution systems," were designed as one-way electricity delivery mechanisms, with very little, if any, visibility for its operators into whether and how well these systems are operating. It is widely recognized in the energy industry that even today, distribution system

operators often only learn of problems on the distribution systems when customers call to notify them. Enphase Energy's existing smart inverter technology, acting alone or in combination with other smart technology available today, can make today's distribution systems into a smarter, flexible, more reliable and functional network. With equipment such as ours, very high penetrations of renewable energy can be achieved in a cost-effective, fully reliably manner— and improve service to energy customers.

8. Enphase Energy's equipment provides detailed, frequent information on the quality of power on distribution systems, and is capable of adjusting power and reliability service outputs to help maintain a stable, reliable grid. The information our smart inverters provides about power conditions helps enable system planners and operators to ensure reliability, giving them visibility into system behavior that would otherwise require expensive deployment of new equipment. The control capabilities our existing products also help grid operators respond to changing grid conditions, providing key tools to maintaining reliability, again without expensive new grid equipment. The combination our existing products offer of enhanced information and enhanced distribution system control can increase the reliability of distribution systems relative to current conditions, and can lower the costs of distribution system upgrades that would otherwise be necessary as our nation's aging electrical infrastructure needs replacement.

9. Enphase Energy's experience in Hawaii, which has the largest percentage of customer rooftop solar in the United States, demonstrates that existing, affordable technology can enhance the energy system, making it more reliable and more climate-friendly at the same time. Our smart inverters were able to substantially reduce the costs of grid infrastructure that would otherwise be needed in Hawaii, simply through reprogramming of their settings. The information and control capabilities of our products enabled additional customers to install rooftop solar, increasing renewables penetration and providing significant relief from the high costs of electrical energy in Hawaii. The additional distributed energy deployment is also helping Hawaii build resilience, energy security, and the increased stability of rates that comes from diversifying energy sources.

10. The Clean Power Plan would achieve significant reductions in carbon emissions by shifting from high-emitting to low- or zero-emitting energy sources, such as solar. Implementing the Clean Power Plan will provide an incentive for utilities across the United States to procure advanced energy technologies that are clean and improve grid reliability. Enphase Energy combines solar, energy management, and storage into a simple, reliable and cost-effective solution. Accordingly, Enphase Energy expects that its business and ratepayers will benefit directly from implementation of the Clean Power Plan, simultaneously reducing costs, increasing reliability, and protecting against climate change.

Dated: December 7, 2015

Jason Simon

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF MICHAEL I. STORCH

I, Michael I. Storch, declare as follows:

1. I submit this declaration in support of this Response in Opposition to Petitioners' Motions for Stay by Respondents-Intervenors.

2. I am Michael I. Storch. Executive Vice President , Chief Company Development Officer, Enel Green Power North America, Inc. I am responsible for commercial activities including all mergers and acquisition related activities in the "Americas" with a heavy focus on creative structurs, tax optimization,

negotiations and other commercial activities related to renewable energy projects. I have a Bachelor of Business Administration degree from Baruch College, New York and am a certified public accountant.

3. I have worked for twenty-eight years in the renewable energy space and have extensive expertise in all aspects of project finance, tax investor transactions, power purchase agreements and project development.

4 My declaration is based on my direct experience as a professional responsible for mergers and acquisitions, management of operations, project financing and structured tax financings, administration, investor relations and strategy and business development work.

5. I am supplying this declaration at the request of movant-intervenors the American Wind Energy Association ("AWEA") and Solar Energy Industries Association ("SEIA").

6. The purpose of my declaration is to provide information to the court relating to the question of whether the wind and solar energy industries might suffer harm if a stay were granted of the U.S. Environmental Protection Agency's ("EPA") Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,662 (Oct. 23, 2015) ("Clean Power Plan").

7. In preparation for this declaration, I have become familiar with: (a) the Clean Power Plan; (b) the Petitions for Stay; and (c) the declarations thereto. In addition, I am acquainted with the other documents cited in this

declaration.

8. Petitioners have requested a stay of the Clean Power Plan. Petitioners claim that their affected industries will be immediately harmed by the Clean Power Plan. I do not believe that the Clean Power Plan will cause significant retirements or investments during the litigation period given the uncertainty about state plans and the long lead-time available. But to the extent Petitioners' claims of harm are correct, AWEA and SEIA's members face a reciprocal harm from the grant of a stay because wind and solar energy are a substitute for coal-fired power plants.

9. In recent years, wind and solar energy have made significant gains and have achieved historic levels of deployment. The United States has an installed wind capacity of 69,471 MW with over 13,250 MW of wind currently under construction and an additional 4,100 MW in the advanced stages of development. Likewise, the United States has an installed solar capacity of 22,700 MW with over 5,200 MW of solar under construction and an additional 11,400 MW in the advanced stages of construction. Respondent, Enel Green Power North America, Inc. currently operates approximately 28.4 MW of solar in Nevada, and 2.5 MW of solar in Vermont. Across the wind industry, nearly 3,200 MW of wind projects have not yet started construction but have secured long term PPA agreements for at least a percentage of the project's capacity. Approximately 560 MW of wind projects have been announced to proceed under direct utility ownership. Nearly 400 MWs of additional wind capacity have placed firm turbine orders but do not currently have an offtake agreement

secured. Therefore, a total of 17,400 MW of wind projects are either under construction or are in the advanced stages of project development. These projects are reasonably expected to be completed in the near term. This investment in wind is being driven primarily by the improved economics of wind energy.

10. Last year, more than $8.5 billion was invested in new wind and $17.8 billion was invested in new solar energy projects in the U.S. Wind project debt provided totaled $2.7 billion. Tax equity investments totaled $5.8 billion. These investments were made by domestic and foreign financial institutions (banks, insurance companies etc.), energy companies, other corporations, and hedge funds. Most, if not all, of the investors in renewable energy projects invest capital around the world. Policy uncertainty results in business and investment uncertainty. The uncertainty regarding the form of state plans is clouding the investment outlook from the Clean Power Plan. By delaying the development of state plans, a stay would further extend this period of uncertainty. Investors do not like uncertainty and can take their capital and invest it elsewhere in response, which will harm the domestic renewable energy industry by making it more difficult to find affordable project-level debt and equity, including construction loans, project debt, and project equity, which are essential to getting projects, including those with signed power purchase agreements, from development into construction and then operations.

11. Currently, American wind power supports 73,000 well-paying jobs, including nearly 20,000 manufacturing in one of the fastest-growing U.S. manufacturing

sectors.[1] Likewise, American solar power supports over 200,000 well-paying jobs, including nearly 32,500 in manufacturing. Wind and solar power support jobs in all 50 states, including sought-after manufacturing jobs at more than 1150 factories in 48 states. At the same time, the costs of wind energy have decreased by more than two-thirds over the past five years. In light of these domestic developments in the US, as well as the international context, including the United Nations Framework Convention on Climate Change negotiations, investors are increasingly focused on renewable energy.

12. The Clean Power Plan will further incentivize the U.S. to continue the transition to renewable and other clean energy sources. While there are many ways that the Clean Power Plan will do so, the final rule includes a new program, the Clean Energy Incentive Program, designed to incentivize near-term development of renewable energy sources, as well as certain demand-side energy efficiency projects. Also known as the CEIP, the program will reward developers that are able to complete certain eligible renewable energy facilities during the two-year period before the Clean Power Plan's compliance period goes into effect in 2022. It is important to note that the litigation before the D.C. Circuit is expected to conclude before developers start to make investments that may receive CEIP credits. This means that CEIP investments will not cause competitive harm to movants before the case has been resolved.

13. The Clean Power Plan sets forth a basic framework for how the CEIP can incentivize early investments in renewable energy projects. Under the CEIP,

[1] AWEA PTC White Paper at p. 6 (2014).

the EPA will provide additional credits to developers of certain types of renewable projects that commence after states submit a final plan. Specifically, under the CEIP, a developer of an eligible wind or solar power project will receive one emissions-reduction credit from the state and one matching credit from the EPA for every 2 megawatt-hours that the project generates in 2020 or 2021.

14. Under the CEIP, the EPA will provide matching credits up to an amount that represents the equivalent of 300 million short tons of carbon dioxide emissions. These credits will be tailored to work within the state programs, regardless of whether they are using rate- or mass-based standards. The EPA indicated in the final rule that it intends to reserve a portion of this pool for eligible wind and solar projects; however, the EPA has not yet determined how the pool will be divided.

15. States interested in participating in the CEIP must meet certain requirements. Such states must include in their initial state plan submittals, due on Sept. 6, 2016, a nonbinding statement of intent to participate in the program, regardless of whether that submittal details a final plan or seeks an extension for doing so. States can also submit final plans as early as Sept. 6, 2016 and as late as Sept. 6, 2018. The EPA plans to allocate all federal matching credits by Sept. 6, 2018.

16. Information provided by the EPA to date on the CEIP suggests that the program will provide a meaningful incentive for renewable project developers to undertake new projects in participating states. While project developers may need to wait several years before they can reap the rewards of the CEIP,

developers are already engaging the EPA and state policy makers to ensure that the program is designed and implemented to increase early investment in renewables. In fact, renewable project developers are already positioning themselves to take advantage of CEIP incentives.

17. For the many renewable energy developers, such as Enel Green Power North America, Inc. that are looking to take advantage of the CEIP program, it is critical that the program not be postponed by being stayed. If a stay were granted, the date for a state to elect to participate in the CEIP could be deferred. As there is likely to be at least 300 million short tons of early action credits for renewable projects, a postponement of the date on which states indicate if they want to participate in the CEIP could have serious consequences for renewable energy investment, sending a cloud of uncertainty if projects would ultimately be developed to meet the demand created by this program. Moreover, given the requirement that CEIP-eligible projects cannot commence construction until a final state compliance plan is submitted to the EPA (which can be as late as September 2018), project developers and other industry participants would also be harmed because it would delay the amount of time in which they would have to become operational in order to be online in time to earn the matching credits from the EPA in the eligible years of 2020-2022. In other words, if a stay lasts too long, it could be difficult for project developers to complete construction before the start of the period for accruing credit under the CEIP.

18. A stay would frustrate financier efforts to invest in these projects as well as

developer efforts to negotiate Power Purchase Agreements over the next couple of years as potential buyers may put decisions on hold pending more policy certainty. Respondent, Enel Green Power North America, Inc., and other renewable energy developers—not Petitioners—bear the financial risk of developing wind and solar projects. In Respondent's experience, site identification to commercial operation of a wind energy project can take from three to four years and cost approximately 1.7 million dollars per installed megawatt. It is crucial that sites are prepared and plans are developed for renewable energy projects that can help states comply with their future obligations under the Clean Power Plan. A stay would decrease the pipeline of projects under development and would make future compliance with the emissions targets required by the Clean Power Plan much harder. It could also frustrate industry efforts to retain employees in anticipation of this program.

19. The scope of these job losses could have impacts on the broader US economy as well. An analogy can be made to job losses that are related to uncertainty in tax policy with respect to wind energy. After the expiration of the Production Tax Credit in 2012, there was a drop from 80,700 wind-energy related jobs in 2012 to 50,500 jobs in 2013. This contributed to the close of two utility-scale blade manufacturing facilities and two turbine nacelle facilities during 2014. In addition, wind energy costs rose immediately thereafter as it took time for the industry to make up for these loses. There is reason to assume that the same would occur if a stay were granted.

20. Decarbonization of the electric grid is possible and the Enel Group has already made that a reality in Europe. As Italy's largest power company and Europe's second listed utility by installed capacity, the Enel Group is a leading integrated player in the power and gas markets of Europe and Latin America. It overseas power generation from a net installed capacity of almost 90 GW, distribution of electricity and gas through a network of over 1.8 million km, and delivery of energy to approximately 61 million customers. Over 47% of the power generated by Enel in 2014 was carbon free. Enel's low carbon commitments include: (1) by 2020, cutting CO2 emission intensity by 25% with respect to 2007 levels; (2) achieving carbon neutrality before 2050; (3) investing significantly in RES (more than 11 Bn€ of capex for over 9 GW of additional capacity during the period 2015-2019); and (4) researching and developing new environmentally friendly technologies. As the Enel Group has shown, with the right mix of low carbon investments, utilities and electric systems can be decarbonized without halting economic growth.

21. In conclusion, the grant of a stay would likely harm movant-intervenors, AWEA and the wind industry, through an interruption of the development of renewable energy resources that would occur if the Clean Power Plan is stayed, and this could have a broader impact to the U.S. economy.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 7th day of December, 2015, in Andover, Massachusetts.

Signature

Michael I. Storch
Executive Vice President
Enel Green Power North America, Inc.

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	)	No. 15-1363 (and consolidated cases)

DECLARATION OF AUSTIN F. WHITMAN
ON BEHALF OF FIRSTFUEL SOFTWARE, INC.

I, Austin F. Whitman, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am Director of Client Solutions and Regulatory Affairs at FirstFuel Software, Inc. ("FirstFuel"). In this capacity I direct FirstFuel's efforts to engage in policy dialogues that have the potential to affect our business. I also work

extensively with FirstFuel's client base of electric and gas utilities who are seeking to use technology to meet energy efficiency goals.

2. Prior to FirstFuel I served for five years as a consultant to electric and gas utilities and electric generating companies on matters related to business planning, policy, and capital investment. Some of my work involved evaluating the business and grid impacts of federal air policy on behalf of investor-owned utility clients.

3. FirstFuel provides software to regulated utilities and energy retailers to help them find energy efficiency and demand reduction opportunities and recruit customers to act on these opportunities by investing in them, primarily through utility-funded programs. FirstFuel's software comprises proprietary analytics and modeling techniques that analyze data from utility meters. Our software has been used to analyze data from more than two million utility meters covering four billion square feet of commercial real estate. We have identified more than 4 terawatt-hours of energy savings opportunities across this building population.

4. FirstFuel is a member of Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015). I am submitting this declaration in connection with proposed-intervenor AEE's brief in opposition to Petitioners' motions to stay

implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan").

5. FirstFuel's technology develops detailed profiles of historical energy use in commercial buildings, broken out by end-use (e.g., heating, cooling, lighting, etc.). In addition, the technology identifies energy efficiency savings potential and forecasts future, weather-adjusted energy use. As such, FirstFuel's technology offers utilities a highly practical, building-level understanding of how savings from energy efficiency can be realized to meet public policy goals and regulatory requirements, such as energy efficiency portfolio standards. The technology also can help utilities as they plan to meet their resource supply requirements.

6. The EPA has stated that the Clean Power Plan will not compromise the reliability of the electrical system. 80 Fed. Reg. at 64663. FirstFuel's experience shows that utilities often use technology, such as ours, to improve reliability by addressing weaknesses and vulnerabilities in the physical electric power grid. Technology offers new ways to anticipate and fix grid limitations before they become reliability issues. First, powerful data analytics are used to find opportunities to reduce demand and consumption. Then, technology is used to "recruit" participation by energy users. When energy users invest in energy

efficiency, they help reduce system peaks and lower the cost of maintaining the grid and building new infrastructure.

7. Indeed, FirstFuel has been called on to help utilities address reliability issues. For example, one large utility in California used FirstFuel's software to find savings opportunities that would alleviate congestion on two substations. Their goal has been to avoid needing to invest in upgrading or replacing the substations at a high cost. We have discussed similar work with utilities in Arizona, Michigan, and New York.

8. Petitioners have argued that there is a lack of cost-effective solutions for Clean Power Plan compliance. FirstFuel has heard this argument numerous times in the context of utility energy efficiency programs. Often, the claim is that energy efficiency spending raises rates for consumers—a claim that Petitioners make here. But energy efficiency and demand reduction are widely shown to be a *least-cost option* for fulfilling electricity and natural gas resource needs. Most recently, for example, Massachusetts approved its next three-year ratepayer funded energy efficiency plan with a target of returning, on average, three dollars of benefits for every dollar of costs. Many other examples exist, showing that

benefits outweigh costs by a factor of two-to-one, three-to-one, or sometimes four to-one.[1]

9. By leveraging state-of-the-art tools of third parties such as FirstFuel, utilities are well positioned to meet new targets cost-effectively under the Clean Power Plan while maintaining reliability. With technologies such as ours, it is becoming easier to find and implement energy savings. Across the billions of square feet of commercial real estate FirstFuel has analyzed, we tend to find that one-half of the savings potential consists of low- or no-cost operational savings measures. Software enables faster identification and verification of savings at scale across large building portfolios.

10. In addition to being highly cost-effective, energy efficiency can be deployed quickly to meet capacity resource needs. FirstFuel's extensive work with utility energy efficiency program staff shows that it takes six to nine months for a typical utility customer to take initial actions to save energy, and up to 18 months to begin realizing deeper energy savings from a given customer. Savings then typically accrue for a period of 7-10 years from an average measure. Thus, while Petitioners argue that a stay of the Clean Power Plan is necessary because utilities will need to take steps immediately in order to meet the EPA's compliance deadlines, FirstFuel's experience shows that energy efficiency measures – which

[1] See, for example, studies from the Michigan Public Service Commission at http://www.michigan.gov/documents/mpsc/2015_Energy_Optimization_Report_501548_7.pdf and the Minnesota Department of Commerce at http://mn.gov/commerce/media/news/#/detail/appId/2/id/71116.

can result in significant carbon emissions reductions – can be implemented in a short timeframe.

11. Twenty-six states have existing programs for managing utility procurement of energy efficiency. Under these programs, there is a tremendous amount of institutional knowledge brought to bear to realize energy efficiency potential. Planning for such programs typically takes 12-18 months. In states where no such programs exist, existing models from other states may be used to build energy efficiency programs in a period of one to two years.

12. Public utility commissions ("PUCs") have come to rely increasingly on energy efficiency to realize the value of "non-wires alternatives" – industry-speak for replacing capital investment with investments in operations. For example, in Southern California, the PUC has opted to undertake targeted energy efficiency rather than encouraging the utility to invest in new generating capacity.[2] PUCs are undertaking these initiatives because of the many benefits to the grid and to ratepayers, mainly in the form of cost savings, reliability, and immediacy of impact.

13. Indeed, many of these priorities of PUCs are also critical in planning for Clean Power Plan compliance. The Clean Power Plan anticipates implementation of demand side measures (see 80 Fed. Reg. at 64,677), and energy

[2] *See, e.g.*, https://www.sce.com/wps/portal/home/about-us/reliability/meeting-demand/our-preferred-resources-pilot/

efficiency and demand reduction strategies are well positioned to serve as a compliance tool that generates cost savings and reliability, and that provides an immediate impact.



Dated: December 8, 2015 Austin F. Whitman

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

State of West Virginia, *et al.* Petitioners, v. United States Environmental Protection Agency, Regina McCarthy, Administrator, United States Environmental Protection Agency, Respondents.	No. 15-1363 (and consolidated cases)

DECLARATION OF MALCOLM WOOLF
ON BEHALF OF PROPOSED INTERVENOR-DEFENDANT
ADVANCED ENERGY ECONOMY

I, Malcolm Woolf, do hereby declare under penalty of perjury that the following statements are true and accurate to the best of my knowledge, information, and belief:

1. I am Senior Vice President for Policy and Government Affairs at Advanced Energy Economy ("AEE"), which has moved to intervene in support of Respondent the U.S. Environmental Protection Agency ("EPA") in *State of West Virginia, et al. v. EPA*, No. 15-1363 (Oct. 23, 2015).

2. My duties at AEE include overseeing the organization's public policy efforts in connection with federal and state regulatory initiatives, outside of California. I am submitting this Declaration in support of AEE's brief in opposition to Petitioners' motions to stay implementation of the EPA's Final Rule entitled "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," 80 Fed. Reg. 64,661 (Oct. 23, 2015) (the "Clean Power Plan"). I previously submitted a declaration in support of AEE's motion to intervene in this case. *See* Doc. No. 1580130, Ex. A.

3. AEE is a national organization of businesses dedicated to making the energy we use secure, clean, and affordable. AEE and its state and regional partner organizations, which are active in 27 states, represent more than 1,000 companies and organizations that span the advanced energy industry and its value chains. In the United States alone, the advanced energy market represented nearly $200 billion in revenue in 2014—and $1.4 trillion globally.[1] Technology areas represented include energy efficiency, demand response, natural gas, wind, solar, smart grid, nuclear power, and advanced transportation systems. AEE's mission is to transform public policy to enable rapid growth of advanced energy companies. AEE promotes the interests of its members by engaging in legislative and

[1] *See* AEE's *Advanced Energy Now 2015 Market Report*, http://info.aee.net/hs-fs/hub/211732/file-2579243232-pdf/PDF/aen-2015-market-report-highlights.pdf.

regulatory policy advocacy at the federal and state levels. Consistent with its mission of promoting the growth of advanced energy companies, AEE supports the Clean Power Plan.

4. AEE participated extensively in the notice-and-comment process on the notice of proposed rulemaking on the Clean Power Plan, 79 Fed. Reg. 34,830 (June 18, 2014). In addition to submitting formal comments to the EPA, AEE has also prepared and commissioned several analyses on the Clean Power Plan and related issues. Specifically, AEE and the affiliated AEE Institute, a 501(c)(3) charitable organization with a mission of raising awareness of the public benefits and opportunities of advanced energy, commissioned the following analyses:

- *Advanced Energy Technologies for Greenhouse Gas Reduction: 40 Solutions for Cutting Carbon from Electricity Generation*. *See* http://info.aee.net/epa-advanced-energy-tech-report.
- *NERC's Clean Power Plan 'Phase I' Reliability Assessment: A Critique*. *See* http://info.aee.net/nerc-cpp-phase1-critique.
- *EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review*. *See* http://info.aee.net/brattle-reliability-report.
- *Competitiveness of Renewable Energy and Energy Efficiency in U.S. Markets*. *See* http://info.aee.net/competitiveness-of-renewable-energy-and-energy-efficiency-in-us.
- *Integrating Renewable Energy into the Electricity Grid*. *See* http://info.aee.net/integrating-renewable-energy-into-the-electricity-grid.

- *Impacts of the Clean Power Plan on U.S. Natural Gas Markets and Pipeline Infrastructure*. *See* http://info.aee.net/impacts-of-clean-power-plan-on-us-natural-gas.

- *Markets Drive Innovation: Why History Shows that the Clean Power Plan Will Stimulate a Robust Industry Response*. *See* http://info.aee.net/market-response-to-epa-clean-power-plan.

- *Design Principles for a Rate-Based Federal Plan Under EPA's Clean Power Plan*. *See* http://info.aee.net/rate-based-federal-plan-under-clean-power-plan.

- *Assessing Virginia's Energy Future: Employment Impacts of Clean Power Plan Compliance Scenarios*. *See* http://info.aee.net/virginia-energy-future.

- *AEE's State Tool for Electricity Emissions Reduction (STEER), Arkansas, Michigan, Pennsylvania, and Virginia State Tool for Electricity Emissions Reduction (Arkansas STEER, Michigan STEER, Pennsylvania STEER, and Virginia STEER)*. *See* http://info.aee.net/steer; http://info.aee.net/steer-arkansas; http://info.aee.net/steer-michigan, http://info.aee.net/steer-pennsylvania; http://info.aee.net/steer-virginia.

5. In this Declaration, I present the following information in support of AEE's opposition to Petitioners' motions to stay the Clean Power Plan:

- Petitioners contend that EPA improperly considered emission-reduction actions that can take place outside the boundaries of a particular facility. But the electric power system is not simply a set of individual electric generating units ("EGUs," or "power plants"). Rather, EGUs operate within a highly integrated system of generation, transmission, and distribution facilities. The Clean Power Plan reflects that reality by expressly contemplating a wide variety of compliance measures, including improving heat rate at existing coal-fired plants; shifting electricity generation from high-emitting coal plants to lower emitting gas plants; shifting electricity generation from fossil steam and gas plants to zero-emitting renewable energy sources; exploiting energy efficiency measures; and participating in trading

markets for energy credits. Significantly, the Clean Power Plan does not mandate that states and EGUs employ any specific one of these approaches or others; rather, it affords the flexibility to exploit any number of compliance mechanisms. And regulated entities and the energy markets have a long history of successfully deploying such measures to provide a host of benefits, including emission reductions, to the energy system. Petitioners' claims that the Clean Power Plan effects a radical transformation of the energy system that must be stayed are therefore without merit.

- Because renewable energy resources such as wind and solar power can be deployed with little lead time, Petitioners are wrong to assert that they cannot meet compliance deadlines without a stay. Renewable energy resources, which are widely available, are extremely cost-competitive with traditional resources, and will only become more so in the future. Indeed, in many markets, wind power is the lowest-cost power source among all supply options, and utility-scale solar projects deliver electricity at costs comparable to gas and coal-fired power plants.

- In arguing that they must take steps immediately to comply with the Clean Power Plan, Petitioners ignore that states and EGUs can also comply with the Clean Power Plan through demand-side energy efficiency measures that can be deployed rapidly. Energy efficiency has come to play a significant role in the integrated electricity system. It is generally the least-cost mechanism to meet existing energy demand, and can result in significant emissions reductions. Indeed, modeling shows energy efficiency measures alone can result in significant compliance with Clean Power Plan's emission-reduction targets. Because energy efficiency can be swiftly deployed to achieve such reductions, Petitioner's arguments that they will be unable to meet the Clean Power Plan's compliance timeline are without merit.

- The Clean Power Plan will not negatively impact energy reliability. Although the Clean Power Plan will likely lead to a small increase in natural-gas demand, existing and already-planned pipeline development can readily accommodate the vast majority of such demand. Nor will increased reliance on sources other than coal create reliability challenges. To the contrary, states can (and already do) employ a variety of measures to enable high levels of renewables to

be integrated into the electricity grid without impacting reliability. And a host of other advanced energy technologies that can participate as compliance options, including energy efficiency and demand response, explicitly improve reliability. Petitioners' fears that the Clean Power Plan will harm consumers by threatening the reliability of the electricity system are wholly unfounded.

- The availability of emission-trading as a compliance mechanism further undercuts Petitioners' claims that they will suffer immediate harm. Emissions-trading systems have existed under other EPA Clean Air Act regulations—and those markets have been remarkably successful in reducing emissions. I believe that the Clean Power Plan will lead to the development of similarly robust trading markets. Because such markets can be utilized rapidly to comply with the Clean Power Plan, the availability of emission-trading mechanisms undercuts Petitioners' claims that they will suffer harm because they must start complying with the Plan immediately. Such markets can be utilized rapidly and thus concerns about immediate harms are unjustified.

- Finally, while the harms alleged by Petitioners are speculative, a stay of the Clean Power Plan would harm AEE's members and the advanced energy industry. Advanced energy technologies already have a significant market share that is growing rapidly. A stay of the Clean Power Plan, however, will inject uncertainty into this rapidly growing sector and make it more difficult to obtain affordable project-level debt and equity necessary for advanced energy project development. A stay would also make it more difficult for energy efficiency projects to take advantage of emission-reduction credits offered under the Clean Power Plan's Clean Energy Incentive Program, further harming the industry.

The EPA Appropriately Interpreted Its Authority In Implementing the Clean Power Plan

A. The Clean Power Plan Appropriately Reflects the Interconnected Nature of the Electricity System

6. The Clean Power Plan establishes guidelines for states in developing plans to reduce carbon dioxide ("CO_2") emissions from existing fossil-fuel-fired

EGUs. It sets CO_2-emission performance standards for two subcategories of EGUs: fossil-fuel-fired electric steam generating units (principally, coal- and oil-fired power plants), and natural-gas-fired combined cycle ("NGCC") generating units. *See* 80 Fed. Reg. at 64,663.

7. Under section 111(d) of the Clean Air Act, states must submit plans that establish standards of performance for regulated entities. These standards of performance must be based on "the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the [EPA] Administrator determines has been adequately demonstrated" (hereinafter, "BSER").[2]

8. The EPA determined that the BSER consists of three "building blocks" that EGUs may use to reduce CO_2 emissions: (1) increasing the efficiency of existing coal-fired power plants; (2) increasing electricity generation from lower-emitting NGCC plants, while decreasing electricity generation from higher-emitting fossil-steam-power plants; and (3) increasing electricity generation from zero-emitting renewable energy sources such as wind and solar power while reducing generation from fossil steam and NGCC power plants. Significantly,

[2] 42 U.S.C. § 7411(a).

states are not required to impose on EGUs any particular method to meet the "degree of emission limitation achievable," as determined by EPA; they may permit EGUs to use emission-reduction strategies in addition to or instead of the BSER building blocks.

9. Petitioners contend that EPA exceeded its authority by including generation-shifting measures with the BSER. But the BSER adopted by EPA reflects that the electric power system is not simply a set of individual and independent EGUs. Rather, EGUs operate within a highly interconnected system of generation, transmission, and distribution facilities. Unlike many other commodities, the physical nature of electricity requires that generation and consumption be balanced in real time. Since electricity cannot be stored easily, supply cannot generally exceed demand. As a result, EGUs cannot be viewed in isolation. This interconnectedness is reflected in the planning and operations of the electricity system.

10. With regard to operations, if an EGU owner decreases output from one source (*e.g.*, a coal-fired EGU), the electric system will replace that output with other resources. The replacement generation could come from another coal-fired EGU, or it could come from lower-emitting sources such as renewable generation. Or the reduced generation could be offset with reduced end-use demand. This takes place in real time, *i.e.*, if the output of a coal plant is decreased

(whether by choice or due to problems at the plant), output from another plant must increase (or demand must decrease) to keep supply and demand in balance. System operators maintain sufficient operating reserves to maintain reliability when these changes occur unexpectedly. Changes in operation of a given unit also take place over longer timeframes, for example, if a coal plant is retired or transitions from baseload operation (where it operates essentially at full load all the time) to intermediate load operation (where it may ramp up or down throughout the day in response to changes in demand). On both a short-term and a long-term operational timeframe, system operators make use of the full suite of available resources as needed, treating the system as an integrated whole.

11. The highly interconnected nature of the electric grid is also evident in how balancing authorities conduct planning. There are 67 balancing authorities across the contiguous United States; together, the areas covered by these balancing authorities comprise the electric grid. Some balancing authorities control large areas that span one or more states, such as the seven Regional Transmission Organizations and Independent System Operators ("RTOs") that also perform other market coordination and planning duties. Other balancing authorities cover

much smaller areas, such as a single city or utility territory.[3] On day-to-day timescales, balancing authorities must ensure that there is adequate generating capacity to meet expected demand. Within individual balancing authority areas, there can be multiple entities that own generating resources or demand-side resources, especially in larger balancing authorities that span multiple states. There is also coordination between balancing authorities via imports and exports of power.[4]

12. For example, each day, ISO-New England produces both a *Morning Report* and a *Seven-Day Capacity Forecast,* to assess daily and weekly system conditions.[5] This report is part of ISO-New England's responsibility as a balancing authority to ensure that there is adequate generating capacity of different types (baseload, intermediate, and peaking), and that there is sufficient reserve margin to deal with contingencies, such as the unexpected forced outage of one or more generating units or transmission lines. This means that, on a daily basis, ISO-New England considers the entire electricity system in its territory, including

[3] *See* U.S. Energy Information Administration, *EIA-930 Hourly Electricity Balancing Authority Data* (2015), *available at* https://www.eia.gov/conference/2015/pdf/presentations/kaplan.pdf.

[4] *See* National Renewable Energy Laboratory, *Balancing Area Coordination: Efficiently Integrating Renewable Energy Into The Grid* (June 2015), *available at* http://www.nrel.gov/docs/fy15osti/63037.pdf.

[5] *See* ISO-New England, *Morning Report* (2015), *available at* http://www.iso-ne.com/markets-operations/system-forecast-status/morning-report.

fossil fuel-fired plants, nuclear generation, renewable energy capacity, and demand-side resources.

13. Efforts in the western United States are further evidence of the interconnectedness of the electric system. In particular, the new Energy Imbalance Market ("EIM") is meant to improve the integration of variable renewable generation by making greater use of other generating assets across a wider geographic area (*i.e.*, among different balancing authorities).[6] On longer timescales (months to years), balancing authorities conduct planning and analysis to ensure adequate generating capacity will exist to meet load projections, taking into account EGU retirements, uprates, or new additions. The responsibilities and functions of the balancing authorities are both necessary and possible because of the interconnectedness of the electricity system, with all EGUs considered together as components of a much larger system.

14. In addition to balancing authorities, numerous other entities engage in planning activities that reflect the interconnected nature of the electricity system. The seven RTOs—which collectively serve two-thirds of U.S. electricity load[7]—act as balancing authorities, while also operating the transmission system and

[6] *See* California ISO, *Energy Imbalance Market* (2015), *available at* http://www.caiso.com/informed/Pages/EIMOverview/Default.aspx.

[7] FERC, *Electric Power Markets: National Overview* (2015), *available at* http://www.ferc.gov/market-oversight/mkt-electric/overview.asp.

conducting bid-based markets for energy, capacity, and ancillary services. In addition, utilities in both vertically integrated and restructured markets engage in resource planning, with all but 11 states requiring some sort of formal plan filing such as an Integrated Resource Plan ("IRP"). IRPs consider different options for meeting projected future load, including considerations of demand-side resources such as energy efficiency.[8] Through these planning processes, market participants consider the electricity system as a whole, balancing competing priorities such as cost, resource adequacy, fuel availability, customer preferences, transmission requirements, and environmental policies and other regulations. In planning for future system needs, utilities, RTOs, and other stakeholders consider individual EGUs in the context of the broader system.

15. While the electric grid is treated as an interconnected system for both operations and planning, there are key differences between vertically integrated markets and restructured markets that warrant additional explanation. In many parts of the country, EGUs are owned and operated by vertically integrated utilities that also own or contract for renewable energy, and can control the dispatch mix among these resources to reduce generation from fossil units. Such utilities can

[8] *See* Regulatory Assistance Project, *Best Practices in Electric Utility Integrated Resource Planning* (2013), *available at* http://www.raponline.org/document/download/id/6608.

make both short-term dispatch decisions regarding the utilization of fossil-fired facilities versus zero-carbon facilities, as well as long-term planning decisions to replace existing fossil capacity with new renewable or other low- or zero-emitting capacity.

16. In restructured (unbundled) markets, EGUs are owned by independent generation companies or unregulated affiliates of regulated utilities. Regulated utilities continue to own and operate their transmission and distribution systems as natural monopolies, but the production of electricity—as well as the decision to build new generating facilities—is done via a competitive marketplace. Participants in these competitive wholesale markets can choose to build new generating facilities of various types in response to system needs (*e.g.*, new peaking plants), market forces (*e.g.*, customer demand for renewable energy) or policies (*e.g.*, renewable portfolio standards).

17. In some cases, owners of power generating facilities will have a portfolio of assets encompassing fossil fuel and non-fossil fuel EGUs, and can adjust the operation of the portfolio to reduce emissions while still meeting system needs. Decisions on new plant construction, retirement or changes in operating patterns will be made based on the combination of market rules, policies including environmental regulations, and the general state of supply and demand in the market. Nevertheless, as with vertically integrated utilities, emissions from fossil-

fired EGUs can be reduced by increasing the use of zero-carbon facilities within the balancing authority (or outside the balancing authority if there is the ability to import zero-carbon electricity).

18. EPA's treatment of the electricity system as an integrated whole for the purposes of BSER is consistent with the physical nature of electricity, and existing planning and operating procedures across the different market structures currently in use in the United States. Considering individual EGUs in isolation would run counter to the very nature of the electricity system and its well-established procedures. Accordingly, Petitioners are unlikely to prevail in their challenge to the EPA's BSER determination.

B. The Flexibility to go Beyond the Best System of Emission Reductions is also Consistent with the Current Electricity System

19. As noted, the Clean Power Plan does not require states and utilities to take any specific actions—much less any specific actions during the period of litigation. In any event, the Clean Power Plan also permits states and EGUs to employ emission reduction-measures beyond the BSER building blocks, including demand-side energy efficiency measures, distributed generation resources, and demand-side management. Given the current role of these demand-side resources in the electricity system, it is appropriate that they, too, should be available to EGUs to use as eligible compliance measures.

20. As is true of BSER resources, energy efficiency plays an integral role in the integrated electricity system. In some regions, energy efficiency and demand response are accounted for in operations and planning, and even participate in capacity markets alongside affected EGUs as part of the integrated electricity system. For example, PJM Interconnection, an RTO that operates a single balancing authority spanning all or part of 13 states and the District of Columbia, operates a capacity market based on auctions held three years ahead. In the most recent auction, a total of 12,314 megawatts (MW) of demand response and energy-efficiency resources were committed as capacity resources for the 2017-2018 delivery year, with over 99% of energy efficiency bids clearing the market.[9]

21. Similarly, in the ISO-New England region, energy efficiency is being officially forecast and incorporated into the Regional System Plan. Regularly released reports from ISO-New England note how much energy efficiency clears the market in each auction.[10]

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[9] *See* PJM Interconnection, *Demand Response* (2015), *available at* http://www.pjm.com/~/media/about-pjm/newsroom/fact-sheets/demand-response-fact-sheet.ashx; Elisa Wood, "Energy Efficiency Up; Demand Response Down in PJM Capacity Auction" (May 25, 2014), *available at* http://energyefficiency markets.com/energy-efficiency-demand-response-pjm-capacity-auction/.

[10] *See* ISO-NE, *Energy Efficiency Forecast Report for 2018-2023* (Aug. 2014), *available at* http://iso-ne.com/committees/planning/energy-efficiency-forecast;

22. As the technology for generating and using electricity continues to evolve, the interconnectedness of the electricity system is only increasing, with non-BSER resources becoming increasingly integral to system operations. Although examples are many, one particular area of note is the rise of *Distributed Energy Resources* ("DER"). DER is broadly defined to include energy efficiency, energy storage, demand response, distributed generation (*e.g.*, rooftop solar, fuel cells), microgrids and electric vehicles. These resources are either eligible as non-BSER compliance measures (*e.g.*, energy efficiency, demand response that decreases load, distributed generation) or are supportive measures that will allow for increased use of eligible measures (*e.g.*, energy storage and microgrids).

23. DER deployment is one aspect of the evolving electricity system, which is already adapting to a changing resource mix, with lower coal usage and higher penetration of renewable energy generation.[11] For example, as electricity consumers install more rooftop solar, this reduces the amount of generation needed from traditional sources, like EGUs. Increasing end-use energy efficiency has a similar effect. Energy storage may actually increase total electricity generation

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ISO-NE, *2014 Regional System Plan* (Nov. 2014), *available at* http://iso-ne.com/system-planning/system-plans-studies/rsp.

[11] *See* U.S. Energy Information Administration, Table 7.2b, *Electricity Net Generation: Electric Power Sector* (2015), *available at* http://www.eia.gov/totalenergy/data/monthly/pdf/sec7_6.pdf.

(because charging and discharging batteries results in some energy losses), but it can be used to improve integration of low and zero emissions sources of electricity and reduce system losses. Importantly, most types of DER also lead to a reduction in emissions from EGUs.

24. Several states have recognized the transformational effect that DER is having on the grid and have initiated regulatory proceedings to facilitate greater adoption of DER for the benefit of customers that deploy the DER but also for the electric system as a whole. The most notable of these include the Massachusetts Grid Modernization proceeding (DPU 12-76), New York State's Reforming the Energy Vision proceeding (Case 14-M-0101), and various proceedings in California, including the Distributed Resources Plan proceeding (R.14-08-013). Minnesota has also initiated an investigatory proceeding into Grid Modernization (E999/CI-15-556). While the scope of each of these proceedings differs, they are all in response to the evolving nature of the utility business model and the increasing complexity and interconnectedness of the electricity system—from large EGUs down to individual residential customers.

25. In addition to playing an increasing role in both short- and medium-term operations and planning, energy efficiency and other demand-side management measures are important utility resources in both vertically integrated and restructured markets. In vertically integrated utilities, energy efficiency

measures allow EGU owners to reduce the utilization and, therefore emissions, of fossil fuel-fired EGUs. By investing in energy efficiency, EGU owners and operators can avoid investments in and utilization of supply-side resources. Owners and operators of fossil fuel-fired EGUs can and currently do "replace" generation with reduced electricity consumption through end-use energy efficiency measures. Many utilities operate their own energy efficiency programs.

26. Similarly, in restructured markets, emissions from fossil-fired EGUs can also be reduced by increasing demand-side energy efficiency. In these markets, the regulated utilities (which only own transmission and distribution facilities) are typically responsible for administering energy efficiency programs. In that case, the result of these programs is less throughput over the transmission and distribution system, and therefore less demand for generation from the wholesale market, including from fossil-fired EGUs. Thus, the end result is the same as with EGUs owned and operated by vertically-integrated utilities. These efficiency measures can be implemented by the utility or by a third-party provider.

C. Affected EGUs Already Procure Eligible "Beyond-the-Fence-Line" Emission Reduction Measures in the Marketplace

27. In order to achieve cost-effective and efficient compliance, the Clean Power Plan permits affected EGUs to take advantage of non-BSER measures to achieve reductions in a manner that is consistent with how electricity markets already function. A variety of "beyond-the-fence-line" emission reduction

measures are in widespread use today across the entire country, by both EGU owners/operators themselves and by third-party providers. EPA was therefore well within its authority to allow such measures to be considered as compliance options.

28. Owners and operators of EGUs already regularly procure "beyond-the-fence-line" measures eligible for compliance. Because these means of procurement include instances where owners of affected EGUs directly control such "beyond-the-fence-line" measures and instances where they do not, it is important to note that the reliance on such measures in both cases is consistent with systems of emission reduction under prior EPA rules, including traditional command-and-control rules. Specifically, all systems of emission reduction rely on transactions with third party entities. Often EGUs do not construct or install those technologies, even when they are operated "inside the fence-line" of the EGU itself.[12]

29. Even in the most conventional instances of EGUs reducing emissions due to New Source Performance Standards through on-site control technology, it is not unusual for the control technology to be operated by a third party. For

[12] *See, e.g.*, Babcock & Wilcox Power Generation Group, Selective Catalytic Reduction Technology: Redefining NOx reduction through innovation 7 (2012) ("As a single-source supplier, B&W PGG can provide a complete project, combining design, engineering, procurement, supply and construction into one seamless and integrated NOx reduction package"), *available at* http://www.babcock.com/library/Documents/e1013168.pdf.

example, companies such as Alstom (owned by AEE member General Electric) provide EGU owners full operation and management services for air quality control systems (*e.g.*, flue gas desulphurization, selective catalytic reduction systems, power activated carbon, and other emission reduction technologies).[13] Many other large companies, including Babcock & Wilcox and AEE members Siemens and General Electric, provide emission control services to EGU owners.[14] In the case of the Clean Power Plan, there are several means by which owners of affected EGUs can and/or already do procure these services, including but not limited to the seven options listed below. Although a non-exclusive list, the "beyond-the-fence-line" measures discussed below show that it was eminently reasonable for the EPA to assume that EGU owners would be able to access and deploy these measures—and that they could therefore do so within the CPP's compliance timeframe.

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[13] Alstom, *Air Quality Control Systems* (2014), *available at* http://alstomenergy.gepower.com/Global/Power/Resources/Documents/Brochures/air-quality-control-systems.pdf.

[14] Siemens, *Operations and Maintenance Service Program* (2010), *available at* http://www.energy.siemens.com/hq/pool/hq/services/power-generation/service-programs/om.pdf; General Electric, *Environmental Services* (2014), *available at* http://www.ge-energy.com/products_and_services/services./environmental_services/index.jsp; Babcock & Wilcox Enterprises, Inc., *Services by Technology* (2014), *available at* http://www.babcock.com/environmental-solutions/Pages/Solutions-by-Technology.aspx.

30. *First*, many owners of affected EGUs also own or contract for renewable energy and can control the dispatch mix among these sources. This is true when these affected EGUs are owned or operated by vertically integrated utilities, which can be investor-owned utilities ("IOUs") that operate under traditional electricity regulation, municipal utilities ("munis"), or electric cooperatives ("co-ops"). These utilities have significant control over the types of generating capacity they develop or acquire, and over the electricity mix used to meet demand within their service territories. For example, Florida Power & Light ("FP&L") owns a number of solar facilities, including the 25 MW DeSoto facility and the 3.7 GW natural gas/solar hybrid Martin facility, as well as the St. Lucie and Turkey Point nuclear power plants.[15] At the same time, FP&L owns or has a joint interest in 71 units that use fossil fuels.[16] Utilities such as FP&L are able to make both short-term dispatch decisions regarding the utilization of fossil-fired facilities versus zero-carbon facilities, as well as medium-term planning decisions to replace existing fossil capacity with new renewable or other low- or zero-

[15] NextEra Energy, Inc., *2014 Corporate Profile* 9 (2014), *available at* http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MjQ1ODczfENoaWxkSUQ9LTF8VHlwZT0z&t=1.

[16] NextEra, *2013 Annual Report* 8 (2014), *available at* http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MjI4Mjc3fENoaWxkSUQ9LTF8VHlwZT0z&t=1.

emitting capacity. Direct utility ownership of renewable energy is fairly common; utility-owned wind power accounted for approximately 14% to 18% of new U.S. wind capacity from 2005 to 2010.[17]

31. *Second*, EGU owners participating in organized markets retain sufficient control to substitute fossil fuel-fired generation with renewable generation even if they do not control dispatch. This situation is most likely to occur in states where utilities are participants in an RTO. In this case, EGU owners have given up operational control of their transmission facilities, either because of regulation or on a voluntary basis.[18] In some cases, EGU owners also act as distribution utilities and may provide retail electric service to end users. For example, Oklahoma Gas & Electric ("OG&E") owns generation assets utilizing coal, gas-fired combined cycle, and wind technology, among others.[19] This includes OG&E's ownership of three wind facilities, comprising 449 MW of

[17] *See* NA Windpower, *Utility Ownership: Data Anomaly or an Evolving Trend?*, *available at* http://www.nawindpower.com/issues/NAW1310/FEAT_05_Utility-Ownership-%20Data-Anomaly-Or-An-Evolving-Trend.html.

[18] *See* Federal Energy Regulatory Commission, *Energy Primer: A Handbook of Energy Market Basics* 40 (Jul. 2012) ("FERC Primer"), *available at* http://www.ferc.gov/market-oversight/guide/energy-primer.pdf.

[19] Oklahoma Gas & Electric Company, *Integrated Resource Plan* 25-26 (2014), *available at* http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9NTUxMzc4fENoaWxkSUQ9MjQ1OTgwfFR5cGU9MQ==&t=1.

capacity.[20] OG&E participates in the Southwest Power Pool ("SPP"). While OG&E owns and operates EGUs and serves customers, these functions are effectively separate. OG&E sells all generation into SPP and purchases generation from SPP to serve load. Nonetheless, utilities such as OG&E are able to make decisions regarding the utilization of fossil fuel-fired EGUs and energy assets, within the rules of the RTO. Another example is AEP subsidiary AEP Energy Partners, which buys power in the Electric Reliability Council of Texas ("ERCOT") market, and also sells power produced by the coal and wind-generating assets that it owns in the state.[21] These EGU owners can also make longer-term decisions about what types of capacity they choose to develop going forward.

32. *Third*, EGU owners can replace fossil fuel-fired generation with renewable generation through bilateral contract or power purchase agreement ("PPA"). Whether an EGU owner is located in a state that is operating under traditional utility regulation or in a restructured market, that owner may enter

[20] *Id.* at 25 (indicating that OG&E owns the Centennial, Spirit, and Crossroads wind facilities).

[21] *See* American Electric Power, *Investment in Renewable Resources* (2015), *available at* https://www.aep.com/environment/climatechange/renewableenergy.aspx.

bilateral contracts for the sale of power.[22] Such contracts require the EGU to supply a certain amount of power to a customer such as a distribution utility. A good example of this is AEE member Invenergy, an independent power producer ("IPP") that owns generation capacity from various resources including 56 wind projects (5,473 MW), 5 solar projects (49 MW), 8 natural gas combustion turbines (4,529 MW), and 4 storage projects (65 MW). Invenergy enters into bilateral contracts with utilities, electric cooperatives, and commercial power users in many states throughout all regions of the country. IPPs such as Invenergy can help EGU owners by signing bilateral contracts for their own low- or zero-carbon emission generation so that those purchasers can meet their obligations to sell electricity, either directly to customers or to a distribution utility depending on the market structure, yet reduce utilization of their higher emitting EGUs. The bilateral market for renewable energy is well developed. There are no legal or technical obstacles to a fossil fuel-fired EGU owner acting as the counterparty of a bilateral contract for purchase of energy from a renewable generation facility.

33. *Fourth*, EGU owners can ensure that fossil fuel-fired generation is replaced through voluntary Renewable Energy Certificate ("REC") purchases. EGU owners can purchase and retire RECs to ensure that the interconnected

[22] FERC Primer at 59-61.

electric system has sufficient renewable energy to accommodate reductions in EGU utilization. RECs are "tradable certificates of proof that a unit of power has been generated from a clean energy source."[23] RECs are generally bought and sold using REC tracking platforms (although they need not be unbundled from generation) and are usable in both traditional utility regulation states and restructured states. The use of RECs is distinct from the use of tradable credits for CPP compliance purposes, as allowed in the CPP, but demonstrates that EGU owners have experience with accessing the attributes of renewable generation through tradable certificates.

34. *Fifth*, EGU owners with retail customers can offset generation by affected EGUs through reduced demand. These utilities—whether they are IOUs, munis, or co-ops—are able to pair their customer relationships with their generation assets. Direct investments that reduce end-use demand will result in reduced utilization at reasonable cost and without reliability concerns. In Michigan in 2013, utility-run energy optimization programs provided resources at a statewide levelized cost of $20 per megawatt-hour (MWh), which is cheaper than

[23] Jan Hamrin, Clean Energy States Alliance, *REC Definitions and Tracking Mechanisms 1* (2014), *available at* http://www.cesa.org/assets/2014-Files/RECs-Attribute-Definitions-Hamrin-June-2014.pdf.

new natural gas combined cycle generation ($60/MWh).[24] Similarly, the utility Xcel Energy, which operates in both regulated and restructured markets, offers a wide variety of energy efficiency programs, including rebates for energy efficient business equipment and home appliances.[25] Other utilities contract with third-party companies to reduce electric demand from their customers. These firms, including AEE members CLEAResult, Opower and FirstFuel, provide a variety of services to utility customers, from implementing energy efficiency programs and verifying program savings to engaging utility customers and performing home energy audits.[26] In Vermont, which retains a vertically integrated market structure, energy efficiency programs are administered by a separate entity called Efficiency Vermont.[27] Here too, the end result on fossil-fired EGUs is the same.

35. *Sixth*, non-utility EGU owners can also provide energy efficiency services that can complement reductions in utilization of their affected EGUs.

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[24] *See* Michigan Public Service Commission, *2014 Report on the Implementation of P.A. 295 Utility Energy Optimization Programs* (2014), *available at* http://michigan.gov/documents/mpsc/2014_eo_report_475141_7.pdf.

[25] *See* Xcel Energy, *Rebates & Energy Savings* (2014), *available at* http://www.xcelenergy.com/Energy_Solutions/Residential_Solutions/Rebates_&_Energy_Savings.

[26] *See* CLEAResult, *Energy Services* (2014), *available at* http://www.clearesult.com/capabilities/energy-services; Opower, *Solutions*, *available at* http://opower.com/solutions.

[27] *See* Efficiency Vermont, *available at* https://www.efficiencyvermont.com/About-Us/Oversight-Reports-Plans.

IPPs that do not directly serve customer load are still able to take actions that result in end-use energy savings. Many IPPs do this by purchasing or developing complementary business lines that provide energy efficiency services. In order to offset reduced utilization of their fossil fuel-fired fleet, these IPPs can ramp up their energy efficiency efforts. For example, NextEra Energy Solutions (operating as Florida Power and Light Energy Services in Florida) is an energy service company ("ESCO") for federal, state and local governments, as well as business customers.[28] NextEra provides performance contracting services that reduce energy usage by its customers, including through appliance upgrades, building retrofits, energy management and other solutions. These savings can offset the CO_2 otherwise emitted from EGUs owned and operated by sister company NextEra Resources.

36. *Seventh*, EGU owners can demonstrate demand reductions through retirement of energy efficiency credits. Non-utility entities, including independent power producers, can purchase and retire credits representing energy savings. This market is not as established as the market for RECs; however, markets for these credits (called "energy savings credits, "energy efficiency certificates" or "white

[28] FPL Energy Services, *ESCO: Delivering Superior Conservation and Renewable Solutions* (2014), *available at* http://www.fples.com/business/fpl-services-energy-management.shtml.

tags") are developing.[29] For many programs, each credit represents 1 MWh of avoided generation,[30] and may be traded for compliance with state energy efficiency resource standards or as part of a voluntary market.[31] The purchase of efficiency credits by non-utility entities such as IPPs can be used to demonstrate demand reduction associated with reduced utilization of EGUs.

37. This is a non-exclusive list of means by which EGU owners are already procuring "beyond-the-fence-line" resources, demonstrating that it was reasonable for EPA to conclude that EGU owners of all types and across all markets would be able to access these measures within the compliance timeframe.

The Dramatically Declining Cost of RE Underscores that the Clean Power Plan Will Not Increase Energy Costs

38. Petitioners argue that the Clean Power Plan will harm consumers and regulated entities by increasing the costs of energy production and transmission.

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[29] Barry Friedman, Lori Bird & Galen Barbose, National Renewable Energy Laboratory, *Energy Savings Certificate Markets: Opportunities and Implementation Barriers* (2009), *available at* http://www.nrel.gov/docs/fy09osti/45970.pdf. See also *Markets Drive Innovation*, pp. 15-16, *available at* http://info.aee.net/market-response-to-epa-clean-power-plan.

[30] Sterling Planet, *General Motors and Sterling Planet Complete First White Tags Transaction* (2013), *available at* http://www.sterlingplanet.com/ResourceCenter/NewsRoom/tabid/59/post/general-motors-and-sterling-planet-complete-first-white-tags-transaction/Default.aspx.

[31] Joe Loper *et al.*, Alliance to Save Energy, *Energy Savings Credits: Are Potential Benefits Being Realized?* (2010), *available at* http://library.cee1.org/sites/default/files/library/8575/CEE_Eval_Energy%20Savings%20Credits%20_Are%20Potential%20Benefits%20Being%20Realized_1Jan2010.pdf.

See, e.g., Doc. No. 1579999, at 495 (McClanahan Decl. ¶ 8) (estimating "billions in ratepayer costs to comply"). The AEE Institute has commissioned a study entitled *Competitiveness of Renewable Energy and Energy Efficiency in U.S. Markets* (hereinafter, "Competitiveness Study") that demonstrates otherwise.[32] The Competiveness Study shows that, contrary to Petitioners' assertions of harm, renewable energy resources are cost effective—and will only become more so in the future. As discussed further in the next section, the study also shows that energy efficiency today is almost always the lowest-cost resource for meeting demand.

39. Existing coal generation is already being displaced by natural gas, as documented by a recent analysis of generation levels between 2007 and 2013. The analysis shows that the increased natural gas generation, which was largely driven by low gas prices, displaced coal rather than displacing nuclear or hydroelectric generation, or meeting new load.[33] Analysis from the Energy Information Administration ("EIA") indicates that this trend continued between 2014 and 2015,

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[32] *See* AEE Institute, *Competitiveness of Renewable Energy and Energy Efficiency in U.S. Markets* (June 2015), *available at* http://info.aee.net/competitiveness-of-renewable-energy-and-energy-efficiency-in-us.

[33] *See* Alex Trembath, Michael Shellenberger, Ted Norhaus & Marian Swain, *Natural Gas Overwhelmingly Replaces Coal*, The Breakthrough (Dec. 15, 2014), *available at* http://thebreakthrough.org/index.php/issues/natural-gas/natural-gas-overwhelmingly-replaces-coal.

when nearly every region in the U.S. experienced a decline in coal generation that was replaced primarily by natural gas generation.[34] To the extent that future displacement of coal generation will require new capacity to be built, that replacement capacity is unlikely to drive up costs.

40. Renewable resources are already cost-competitive with traditional resources. The most basic indicator of power technology competitiveness is the levelized cost of energy ("LCOE"), which measures the average cost of electricity over the life of a project, including the costs of upfront capital, operations and maintenance, fuel, and financing. Since 2007, Lazard, an independent financial advisory and asset management firm, has tracked the LCOE of power technologies.[35] Lazard's annual analyses show that, from 2009 to 2014, the LCOE for utility-scale wind and solar power declined by 58% and 78%, respectively. Those decreases show that renewable-energy technologies are increasingly competitive with other power sources.

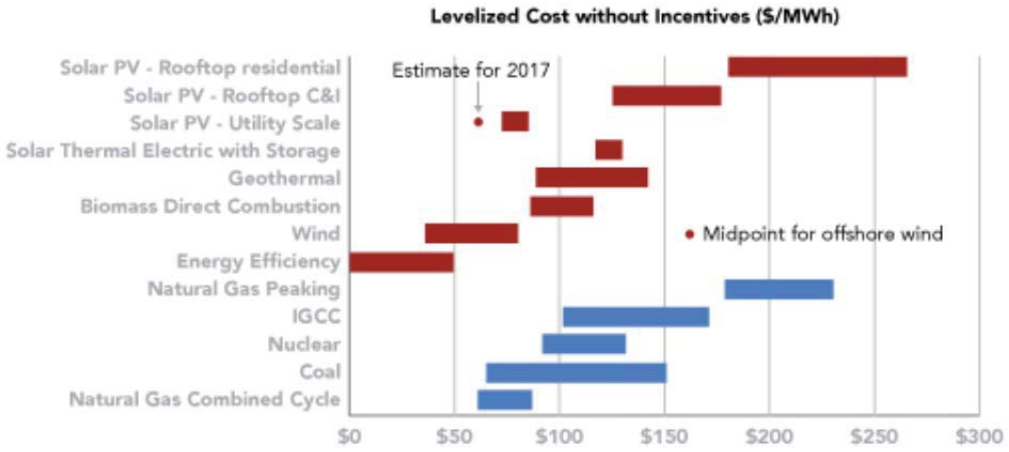
41. In 2014, as calculated by Lazard, the unsubsidized LCOE for wind was $37-$81/MWh, and for utility-scale solar PV was $60-$86/MWh, while the

[34] *See* U.S. Energy Information Administration, *Electricity Monthly Update* (Sept. 2015), *available at* http://www.eia.gov/electricity/monthly/update/resource_use.cfm#tabs_spot-2.

[35] *See* Lazard, *Lazard's Levelized Cost Of Energy Analysis—Version 8.0* (Sept. 2014), *available at* https://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf.

unsubsidized LCOE for new coal was $66-$151/MWh.[36] Indeed, Figure 1 below shows a comparison of all generation and energy efficiency on an unsubsidized basis (i.e., without factoring in incentives). The analysis indicates that wind is currently the lowest-cost power source among all supply options, and that utility-scale solar projects deliver electricity at prices comparable to natural gas and coal-fired plants.

Figure 1: Levelized Cost of Energy (LCOE), All Sources, 2014 [37]



42. Market data in the form of PPA prices confirm these LCOE estimates, with wind projects offering competitive PPA prices relative to wholesale electricity market prices for most of the past decade. In 2013, the latest year for which data is

[36] *Id.* at 2.

[37] Source: *Lazard's Levelized Cost of Energy Analysis—Version 8.0.* "C&I" = Commercial & Industrial; "IGCC" = Integrated Gasification Combined Cycle. High end of range for *IGCC* and *Coal* includes 90% carbon capture and compression. Figure reproduced from AEE's Competitiveness Study, at 9.

available for the United States from the Department of Energy, the average wind power PPA price was $24/MWh—lower than costs of electricity from NGCC and coal-fired plants.[38] Similarly, solar PPAs have declined from $125-$150/MWh in 2008 to current levels of $50-$75/MWh.[39]

43. There is strong evidence in many parts of the country that renewable energy is competing purely on cost with other resources, and that utility renewable-energy purchases once driven primarily by state policies are now increasingly made based on economics. For example, in 2014, Austin Energy signed a 20-year contract for 150 MW of solar energy at a price estimated at less than $50/MWh—lower than the cost of energy from coal or natural-gas-fired plants.[40] In 2015, NV Energy, which is owned by Berkshire Hathaway, beat that price by purchasing the power from a 100 MW solar farm built by First Solar at $38.7/MWh.[41] And in

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[38] *See* Lawrence Berkeley National Laboratory, *2014 Wind Technologies Market Report* (2015), *available at* https://emp.lbl.gov/publications/2014-wind-technologies-ma.

[39] *See* Greentech Media, GTM Research, *The One Chart That Shows Why 2014 Was a Breakthrough Year for Utility-Scale Solar in America* (2014), *available at* http://www.greentechmedia.com/articles/read/the-one-chart-that-shows-why-2014-was-a-pivotal-year-for-us-solar.

[40] *See* Mele Decl. ¶ 4.

[41] *See* Christopher Martin, *Buffett Scores Cheapest Electricity Rate With Nevada Solar Farms*, Bloomberg Business (July 7, 2105), *available at* http://www.bloomberg.com/news/articles/2015-07-07/buffett-scores-cheapest-electricity-rate-with-nevada-solar-farms.

2013, American Electric Power ("AEP") bought three times more wind power in Oklahoma than it originally intended because of its value to ratepayers.[42] In 2015, the CEO of Xcel Energy Inc., a Minneapolis-based utility that serves eight states, noted that the company now views wind power, which is receiving 20 year PPAs for $25/MWh, as cheaper than natural gas power, which it expects will cost $35/MWh over the same period.[43]

44. These and other long-term renewable-energy contracts provide a hedge against fuel price volatility, and show that renewable energy can be procured at prices comparable to—and often better than—those for energy from coal- and gas-fired sources. As the AEE Institute's Competitiveness Study explains, many companies that are large consumers of electricity—including Google and AEE members—are investing in wind and solar projects and committing to long-term contracts for renewable energy supplies to reduce the impact of their significant electricity demand. In fact, more than 23% of wind power contracts in 2014 were with large corporate or non-utility groups, such as universities and government

[42] *See* Diane Cardwell, *Solar and Wind Energy Start to Win on Price vs. Conventional Fuels*, N.Y. Times (Nov. 23, 2014).

[43] *See* Alex Nussbaum & Chris Martin, *Wind Power Now Cheaper Than Natural Gas for Xcel, CEO Says*, Bloomberg Business (Oct. 23, 2015), *available at* http://www.bloomberg.com/news/articles/2015-10-23/wind-energy-cheaper-than-natural-gas-for-xcel-ceo-fowke-says.

agencies, and similar trends are seen with solar.[44] Google, for example, currently meets approximately 37% of its power requirements from renewable energy.[45] And in the largest deal of its kind, AEE member Apple recently signed an $848 million 25-year PPA with AEE member First Solar to provide 130 MW of clean energy.[46]

45. The benefits of renewable energy and its rapidly declining costs are causing growth in the market. FERC compiles quarterly data on new generation capacity which shows that renewables' share of new capacity additions has remained high in the last five years and is increasing. In 2011, renewables accounted for 39% of all new capacity additions. In the first half of 2015, renewables' share went up to 62%.[47] These data do not include new capacity under 1MW, *i.e.*, distributed generation ("DG"). When DG is taken into account,

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[44] American Wind Energy Association, *Market grows for wind energy as leading U.S. brands lock in low prices* (April 8, 2015), *available at* http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=7408.

[45] Google Green Blog, *Tracking our annual carbon footprint* (Oct. 29, 2015), *available at* http://googlegreenblog.blogspot.com/2015/10/tracking-our-annual-carbon-footprint.html.

[46] *See* Ucilia Wang, *Apple Inks 130MW Solar Power Contract with First Solar*, Forbes.com (Feb. 10, 2015), *available at* http://www.forbes.com/sites/uciliawang/2015/02/10/apple-inks-130mw-solar-power-contract-with-first-solar/.

[47] *See* FERC, Office of Energy Projects, *Energy Infrastructure Update* (Sept. 2015), *available at* http://www.ferc.gov/legal/staff-reports/2015/sep-infrastructure.pdf.

renewables made up 75% of new capacity additions in the first half of 2015.[48] Wind alone accounted for 31% of all new capacity additions between 2008 and 2014.[49]

46. Thus, contrary to Petitioners' assertions, renewable energy resources are currently cost effective and widely available. And renewable energy is likely to become even more cost-competitive as the Clean Power Plan incentivizes new investments in renewables and associated technologies.

Energy Efficiency Measures Can Be Implemented by a Range of Actors at Low Cost

47. Petitioners' claims of irreparable harm from rising costs are also at odds with the widespread availability of low-cost energy efficiency compliance options, which can be deployed rapidly to comply with the Clean Air Act. Energy efficiency efforts—whether led by utilities, third party providers, or states—are also a ready opportunity to support compliance with the Clean Power Plan.

48. There are two principal ways in which energy efficiency is delivered today: through utility-run programs and through performance-based contracting offered by ESCOs. Utility-run programs are customer-funded efforts, which are

[48] *See* GTM Research and SEIA, *U.S. Solar Market Insight* (2015), *available at* http://www.greentechmedia.com/research/subscription/u.s.-solar-market-insight.

[49] *See* U.S. Dep't of Energy, *Revolution…Now: The Future Arrives for Five Clean Energy Technologies* (Nov. 2015), *available at* http://energy.gov/sites/prod/files/2015/11/f27/Revolution-Now-11132015.pdf.

managed either directly by the utility or through a third party contractor like AEE member CLEAResult or ICF International that generally target residential and small commercial customers. ESCO performance contracting provides energy efficiency services to institutional, government, and larger commercial/industrial customers using a financing model in which energy savings pay for energy-efficiency investments over time.

49. As demonstrated in Figure 1 above, energy efficiency is almost always the lowest-cost resource for meeting the next MWh of electricity demand. Energy efficiency is also a cost-effective resource for reducing existing demand and any associated emissions. As discussed below, recent modeling has shown that, in several states, energy efficiency is also generally the lowest-cost option for meeting the Clean Power Plan targets.

50. Since ESCO performance contracts must generate sufficient savings to pay for the initial investment, they are, by definition, cost effective. As a result, they produce big savings for customers. For example, AEE member Johnson Controls worked with the public school system in Wyandotte, Michigan, to deliver $6.9 million in energy savings through the installation of new windows and HVAC systems as well as a building energy management system.[50] Pennsylvania has

[50] Andre Davis, Johnson Controls, Inc., *Using Performance Contracting and Incentives to Accelerate Energy Efficiency Projects*, at 4 (2013), *available at*

reduced energy consumption in state buildings by 18% through ESCO services.[51] Along with energy savings, since 1990 ESCOs have delivered an estimated $30 billion in infrastructure investments and 425,000 person-years of employment.[52] The savings and economic impact of these projects have created a large U.S. ESCO market that was up 7% from 2013 levels to approximately $4.7 billion in revenue in 2014, including ESCO-installed HVAC equipment.[53] The market has grown sharply over time, by 240% between 2005 and 2013, according to Lawrence Berkeley National Labs. With an estimated 17 billion square feet of "ESCO-addressable" building space in the United States, the entire ESCO market is expected to double or triple in revenue by 2020.[54]

51. Utility-run programs generally split the cost of energy efficiency between utilities and participants, resulting in economic benefits for both. The

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http://www.johnsoncontrols.com/content/dam/WWW/jci/be/white_papers/GIWhitepaper.pdf.

[51] *See* Nat'l Conf. of State Legislatures, *State Energy Savings Performace Contracting* (Nov. 15, 2013), *available at* http://www.ncsl.org/research/energy/state-energy-savings-performance-contracting.aspx

[52] *See* Nat'l Assoc. of Energy Serv. Cos., *What is an ESCO?*, *available at* http://www.naesco.org/what-is-an-esco.

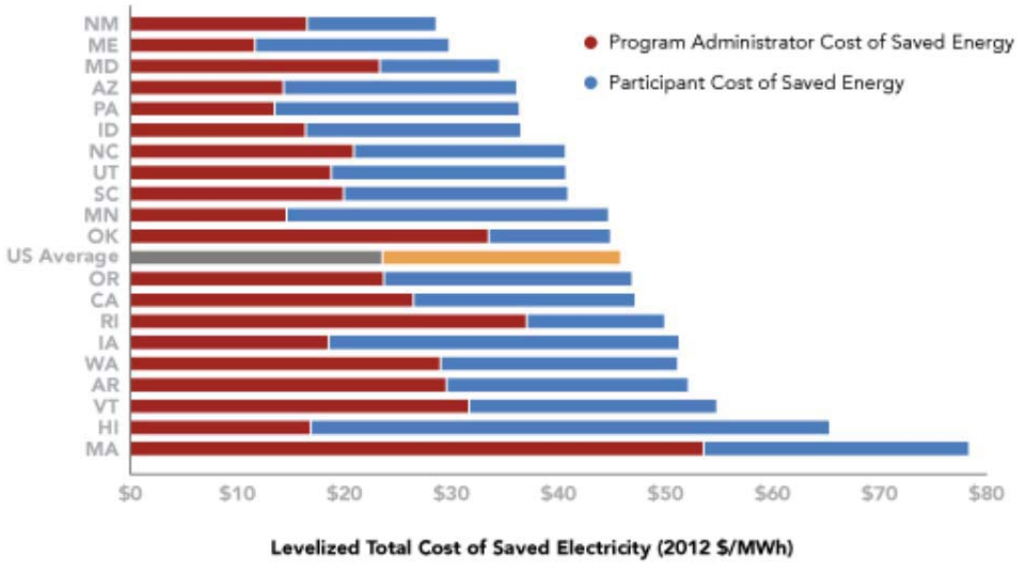
[53] *See* AEE, Advanced Energy Now 2015 Market Report, *available at* http://info.aee.net/aen-2015-market-report.

[54] *See* Elizabeth Stuart *et al.*, *Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry* Sept. 2013), *available at* http://emp.lbl.gov/sites/all/files/lbnl-6300e_0.pdf.

utility cost of providing energy efficiency programs is significantly less than the cost of acquiring new generation, whereas participants see immediate reductions in their monthly utility bills. As shown in Figure 2 below, Lawrence Berkeley National Laboratory estimates the United States' average "total cost of saved energy" for utility energy efficiency programs at $46/MWh, based on an analysis of programs in 20 states over a five-year period. That is less than half the average cost of retail power in the United States and lower than the levelized cost of new supply options, with the possible exception of wind power in some markets.[55] Since the total cost of energy efficiency is below the LCOE of new supply options, its implementation lowers the cost of providing electricity to all customers, thereby benefiting energy efficiency program participants and non-participants alike.

[55] The total cost of saved energy varies by state, ranging from a low of $29/MWh in New Mexico to $79/MWh in Massachusetts, but is consistently less expensive than retail electric supply in the local market

Figure 2: Savings-Weighted Average Total Cost of Saved Electricity[56]



52. Utility efficiency programs originated during the energy crises of the 1970s as a way to help customers cope with soaring energy prices. Since the 1970s, these programs have greatly expanded. Nearly half of states now have efficiency requirements for their utilities. In 2014, utilities invested nearly $7.3 billion, resulting in 26.7 million MWh of electricity savings, a 5.8% increase over 2013.[57] In addition to being cost-effective at reducing electricity demand and

[56] Ian M. Hoffman *et al.*, Lawrence Berkeley National Laboratory, *The Total Cost of Saving Electricity Through Utility Customer-Funded Energy Efficiency Programs: Estimates at the National, State, Sector and Program Level* (April 2015), *available at* http://emp.lbl.gov/sites/all/files/total-cost-of-saved-energy.pdf. Figure reproduced from the AEE Institute's Competitiveness Study, at 14.

[57] *See* Annie Gilleo *et al.*, American Council for an Energy-Efficient Economy, *The 2015 State Energy Efficiency Scorecard* (2015), *available at* http://aceee.org/sites/default/files/publications/researchreports/u1509.pdf.

emissions, widespread use of energy efficiency measures can reduce overall system costs.

53. Energy efficiency allows utilities to defer or avoid upgrades to the transmission and distribution system, providing additional savings to all utility customers. Energy efficiency resources can also reduce wholesale market prices by reducing peak demand, which sets the price for power, thus inducing savings across the system. Technical innovation leads to continuous energy efficiency improvements in areas such as lighting, energy management systems, smart thermostats, and improved appliances, which provide potential for additional savings in buildings that have already undergone older upgrades. As the information and communications industry continues to integrate with the energy industry, smart grid technologies will increasingly provide customers with actionable data on and enhanced control over their energy use, opening up further energy efficiency opportunities.

54. For example, AEE member Opower uses this data to provide utility customers with information, including how customers' energy use compares to similar homes in the same neighborhood, which can be used to reduce energy use. Opower's programs reach over 50 million households and businesses and have saved 8 terawatt-hours of energy—the equivalent of taking all the homes in New

Mexico off the grid for a year.[58] Moreover, Opower's programs have been shown to achieve above-average savings in low income households which have been historically difficult to reach with efficiency programs.

Plants Can Use Energy Efficiency and Other Measures to Comply with the Clean Power Plan Within the Applicable Timeframe

55. Petitioners argue that a stay of the Clean Power Plan is necessary because states and regulated entities must take steps immediately in order to be able to comply with the Clean Power Plan's interim goals, which take effect in 2022. Petitioners contend that compliance requires large capital investments in emission control technology and infrastructure that would be too expensive or too time consuming to achieve in the timeframe provided by EPA. In particular, they argue that the Clean Power Plan fails to take into account the fact that the lead time for new generation projects can be from 5 to 15 years. *See, e.g.*, NMA Br. at 14 (alleging "decadal-scale lead times"); Utility Br. at 15 (contending that the "electric sector is a long lead-time industry" and that planning and constructing new generation can take "between three and seventeen years").

56. Several declarations submitted in support of Respondents rebut that assertion by showing that the lead times for solar, wind, and gas plants are much

[58] *See* Transmission & Distribution World, *Opower and Utility Partners Save Over Eight Terawatt-hours of Energy* (July 9, 2015), *available at* http://tdworld.com/smarter-grid/opower-and-utility-partners-save-over-eight-terawatt-hours-energy; Opower, http://www.opower.com/company.

shorter than Petitioners fear. For example, according to AEE member Invenergy, new solar and wind projects can be brought online within 2-3 years.[59] Natural gas facilities can also be brought into commercial operation quickly: a simple cycle unit can be constructed in two years, and a combined cycle unit can be constructed in 4-7 years depending on the size of the unit.[60] And as described further below, emissions trading markets provide EGUs with another powerful—and rapid—mechanism of compliance. States and affected EGUs therefore do not need to take immediate measures to comply with the Clean Power Plan's 2022 and 2030 performance standards.

57. But Petitioners' "lead time" arguments fail for another reason: They overlook the availability of energy efficiency measures to achieve cost-effective emission reduction. Such measures are already reducing emissions in every State; they are rapidly deployable; they can be applied by utilities, third parties, or through state policy, as discussed further above; and they can easily be scaled to achieve further emission reductions while driving down costs.

58. Based on current trends in cost and deployment of energy efficiency measures (discussed above), I believe that states will attempt to maximize the use of energy efficiency in their proposed plans. EPA's modeling anticipates that

[59] Declaration of Joseph Condo ¶ 6.

[60] *Id.* ¶ 7.

energy efficiency will play a major role in compliance, reducing electricity demand by nearly 8% nationally by 2030. EPA estimates that lower electricity demand as a result of this increased efficiency—combined with lower average retail rates—would result in average electricity bill decreases of 2.7%-3.8% in 2025 and 7.0%-7.7% relative to the reference case.[61] As EPA explained, energy efficiency "is a highly cost-effective means for reducing CO_2 from the power sector, and it is reasonable to assume that a regulatory requirement to reduce CO_2 emissions will motivate parties to pursue all highly cost-effective means for making emission reductions accordingly, regardless of what particular emission reduction measures were assumed in determining the level of that regulatory requirement." *Id.* at 3-12. EPA's modeling concluded that energy efficiency is likely to be a major contributor to emission reduction under the Clean Power Plan.[62]

59. The modeling of AEE Institute confirms EPA's conclusion that energy efficiency measures can result in major emission reductions under the Clean Power Plan. AEE Institute commissioned the development of the State Tool

[61] *See* EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule* (Oct. 23, 2015), *available at* http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf.

[62] Significantly, EPA reached that conclusion even though, in my view, its modeling underestimated the contributions of energy efficiency measures. Specifically, EPA addressed only utility-run energy efficiency programs, without considering the roughly $6 billion annual market served by Energy Service Companies that retrofit institutional, government, and larger commercial facilities.

for Electricity Emissions Reduction ("STEER"). A planning model developed by the University of Michigan and 5 Lakes Energy, STEER is specifically tailored to find the least-cost way for a State to implement the Clean Power Plan. AEE Institute has built and released versions of the STEER modeling system in Pennsylvania, Arkansas, Michigan, and Virginia, and will be releasing STEER models in Illinois and Florida shortly, while other groups are building versions of the model for North Carolina and Georgia. In Pennsylvania and Arkansas, AEE Institute has released white papers examining the results of some STEER modeling in the states, and in Michigan, AEE's state partner has released a similar paper. The result of that modeling shows that the energy efficiency is typically the lowest-cost compliance measure, states can achieve significant reductions in emissions through energy efficiency, and use of energy efficiency for compliance generally *reduces electricity rates for consumers*. It is also clear from this modeling and the work underway in the other states that these results are likely to be consistent across the vast majority of states with compliance obligations under the Clean Power Plan.

60. The STEER modeling shows that energy efficiency can contribute significantly to the lowest-cost methods for Pennsylvania to comply with its carbon emissions goal under the Clean Power Plan. Indeed, the modeling shows that energy efficiency measures in Pennsylvania could account for 66% percent

compliance with the Clean Power Plan's emissions standards—taking only into account the most cost-efficient compliance options. In Arkansas, which has challenged the Clean Power Plan in this litigation, the STEER modeling analysis shows that energy efficiency measures could account for 22% of compliance with the Clean Power Plan's emissions standards (again, just considering the lowest-cost compliance options). The analyses show that, for both states, compliance with the Clean Power Plan (in part through energy efficiency measures) can save ratepayers money.

61. AEE has made the STEER model publicly available for use by State lawmakers, utility regulators, and others who will be responsible for Clean Power Plan compliance—and who can use STEER to calculate the least-cost compliance and implementation strategies, given the policy options and energy variables applicable to their State.

62. Energy efficiency does not simply provide a cost-effective method for complying with the Clean Power Plan in the future. Utilities and administrators implement energy efficiency programs in all 50 states and the District of Columbia, and 24 states have established Energy Efficiency Resource Standards that set binding annual targets for reducing electricity consumption and often

natural gas consumption as well.[63] Many states have also implemented other energy efficiency policies, including enhanced building energy codes and programs to install combined heat and power. These policies complement and enhance the private sector opportunities to support energy efficiency.

63. And indeed, energy efficiency measures have already achieved significant emissions reductions. For example, one study found that, as of 2012, new energy efficiency measures displaced nearly 5 million tons of CO_2 in the Great Lakes/Mid-Atlantic region.[64]

64. Another recent study estimating emission reductions and economic benefits resulting from common energy efficiency policies in all 50 states found that energy efficiency policies alone could reduce greenhouse gas emissions by 600 million tons, save 925 million MWh of electricity, and reduce electricity demand by 25% by 2030.[65]

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[63] *See* Annie Gilleo *et al.*, American Council for an Energy-Efficieny Economy, *The 2015 State Energy Efficiency Scorecard*, at 17 (2015), *available at* http://aceee.org/sites/default/files/publications/researchreports/u1509.pdf.

[64] *See* Synapse Energy Economics, Inc., *Air Emissions Displacement by Energy Efficiency and Renewable Energy* (June 26, 2015), *available at* http://www.synapse-energy.com/sites/default/files/Air-Emissions-Displacement-by-Energy-Efficiency-and-Renewable-Energy_0.pdf.

[65] *See* American Council for an Energy-Efficient Economy, *New Study Outlines Plan for 26% CO_2 Reduction from U.S. Power Sector with No Net Cost to the Economy* (Apr. 30, 2014), *available at* http://www.aceee.org/press/2014/04/new-study-outlines-plan.

65. Additionally, Deutsche Bank and the Rockefeller Foundation estimate that there is room for $279 billion in investment in energy efficiency at existing buildings in the U.S., which could save $100 billion and mitigate more than 600 million metric tons of carbon emissions annually.[66]

66. Significantly, these highly effective energy efficiency measures can be deployed rapidly to comply with the Clean Air Act. Based on my experience, ESCO-led energy efficiency projects usually entail 1-2 years of planning and development, with another year for installation, although certain types of projects can happen more quickly. For utility-based programs, new energy efficiency measures can be implemented almost immediately, and new programs can be deployed in less than two years.

67. Affected entities can therefore rapidly deploy energy efficiency measures to achieve significant compliance with the Clean Power Plan. In my view, Petitioners' claims of irreparable harm are overstated, as affected entities can rapidly deploy advanced energy measures, including wind, solar and energy efficiency, to achieve significant compliance with the Clean Power Plan.

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[66] *See* Rockefeller Foundation & Deutsche Bank Group Climate Change Advisors, *United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models*, at 7 (Mar. 2012), *available at* http://web.mit.edu/cron/project/EESP-Cambridge/Articles/Finance/Rockefeller%20and%20DB%20-%20March%202012%20-%20Energy%20Efficiency%20Market%20Size%20and%20Finance%20Models.pdf.

The Clean Power Plan Will Not Negatively Impact Energy Reliability

68. Petitioners contend that a shift to low-emitting sources under the Clean Power Plan will "jeopardize the reliability of the nation's electricity system." Utilities Br. at 1; *see also* Doc. No. 1579999 at 357 (Bracht Decl. ¶ 10) ("The Section 111(d) Rule will also severely threaten reliability and increase the cost of electricity by forcing Nebraska to move immediately toward reliance on a limited number of fuel sources."); *id.* at 515 (Nowak Decl. ¶ 14) ("The immediate and sweeping changes to the generation fleet [in response to the Clean Power Plan] could also result in significant decreases in reliability.").

69. Petitioners (and other opponents of the Clean Power Plan) make three primary claims as to why they believe the Clean Power Plan could immediately negatively impact reliability. They assert that (1) the Clean Power Plan will lead to increased reliance on renewable energy sources, which are less reliable than non-renewable sources and are more difficult to integrate into the electricity system; (2) the Clean Power Plan will lead to retirements of fossil-fuel-fired plants, creating shortfall in electricity generation capacity and reductions in electricity reserve margins; and (3) there is insufficient gas pipeline capacity to provide the gas required to replace coal generation with gas generation, as contemplated by the Clean Power Plan.

70. The AEE Institute has commissioned several studies that address and rebut these and other reliability concerns. *See generally NERC's Clean Power Plan 'Phase I' Reliability Assessment: A Critique, available at* http://info.aee.net/nerc-cpp-phase1-critique; *EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review, available at* http://info.aee.net/brattle-reliability-report; *Impacts of the Clean Power Plan on U.S. Natural Gas Markets and Pipeline Infrastructure, available at* http://info.aee.net/impacts-of-clean-power-plan-on-us-natural-gas; *Integrating Renewable Energy into the Electricity Grid, available at* http://info.aee.net/integrating-renewable-energy-into-the-electricity-grid. As discussed below, those studies show that the Clean Power Plan will *not* negatively impact energy reliability.

A. Increased Reliance on Renewable Energy Will Not Create Reliability Challenges

71. Petitioners contend that the Clean Power Plan will increase reliance on renewable generation, and that increased reliance on such sources threatens energy reliability. *See* Doc. No. 1579999 at 357 (Bracht Decl. ¶ 10); *id.* at 513-16 (Nowak Decl. ¶¶ 13-15). But the Clean Power Plan does not require states to increase penetration of renewables during the pendency of this litigation in order to meet the CPP's compliance timelines. In any event, the AEE Institute's analyses show the Clean Power Plan will not produce such challenges.

72. To begin with, a majority of states (irrespective of the Clean Power Plan) will have a surplus of renewable generation at the beginning of the Clean Power Plan compliance period if they meet established State policy targets.[67] Those states therefore will not face any new or additional infrastructure constraints as a result of Clean Power Plan compliance. And the fact that preexisting State policies already require increased production from renewable energy sources undermines Petitioners' argument that any shift to renewable energy (and attendant hypothetical harms) will be caused by the Clean Power Plan, as opposed to compliance with other regulatory requirements.

73. In any event, Petitioners' concerns about reliability are overstated. Over the course of the last decade, grid operators have learned how to use a host of operational techniques and technologies to successfully integrate an ever-rising share of renewable energy reliably into the electricity grids. The AEE Institute's *Integrating Renewable Energy into the Electricity Grid* study[68] examines the best practices found in two case studies in the Electric Reliability Council of Texas

[67] *See* AEE Institute, *EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review*, at Table 3 (comparing EPA estimates of achievable renewable energy penetration levels with current State renewable penetration targets for each State).

[68] *See* AEE Institute, *Integrating Renewable Energy into the Electricity Grid*, *available at* http://info.aee.net/integrating-renewable-energy-into-the-electricity-grid.

("ERCOT"), a regional transmission organization, and Xcel Energy Colorado, a vertically integrated utility. Both entities are successfully managing a high and increasing share of electric power from variable renewable resources while maintaining electric reliability. In ERCOT, wind energy provided over 10% of generation in 2014 with the percentage of production approaching 40% during some hours. The grid operator expects total wind capacity in the state to almost double by 2017 and the installed solar capacity is now growing rapidly as well. Xcel Energy Colorado operates a grid that already receives almost 19% of its generation from wind power and a small but growing amount of solar power. These grid operators have used a host of techniques and tools to successfully integrate these levels of renewables, including but balancing area coordination, changes in market rules, better weather forecasting, deployment of demand response, and advancements in renewable energy technologies themselves. It is clear from their work, the work of other grid operators with high levels of renewables like AEE-member California ISO, and a variety of technical integration studies that integration levels will continue to rise.

B. The Power Sector Will Be Able To Meet Reserve Margins To Maintain Reliability

74. Petitioners contend that the Clean Power Plan will lead to the premature retirement of coal-fired power plants, thereby reducing electricity reserve margins necessary for a reliably functioning electricity system. *See, e.g.*,

Doc. No. 1580014, at 646-48 (Burroughs Decl. at ¶¶ 14-20). Reserve margin is a measure of available generating capacity above that needed to meet normal peak demand levels (not the level of capacity necessary to meet normal demand levels).

75. *First*, nothing in the Clean Power Plan requires EGUs to close coal plants. But even if the Clean Power Plan leads to reduced *generation* (or output) from coal plants (and thus reduced CO_2 emissions), that does not mean that the *capacity* (or ability) to meet peak energy demands will be affected, since coal plants can still be used to meet the reserve margin with relatively few hours of operation. Maintaining a set of generators that are generally only used for peak demand is common practice in the industry. Thus, coal plant retirement is not necessary, if these plants remain open for meeting the reserve margin.[69]

76. *Second*, demand-side management technologies such as energy efficiency and demand response reduce peak energy demand—thus lowering the necessary reserve capacity. Indeed, an analysis conducted by the Lawrence Berkley National Laboratory cites load shifting, energy efficiency, and renewable

[69] *See* EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review, at 29.

energy as viable strategies to address resource adequacy and thereby improve overall grid reliability.[70]

77. *Third*, as discussed above, EGUs can rapidly deploy other generation technologies, including wind and solar, to increase generation. In short, with appropriate planning, the compliance deadlines in the Clean Power Plan provide states ample time after the completion of this litigation to address reliability challenges, if any.

C. The Clean Power Plan Will Not Result in a Significant Increase In Gas Pipeline Needs

78. Petitioners and other critics also contend that, by causing a shift to increased natural-gas-fired generation, the Clean Power Plan will stress gas pipeline capacity, thus threatening energy reliability. *See*, *e.g.*, Doc. No. 1579999, at 442-444 (Lloyd Decl. ¶ 33). Pipelines transport gas from production areas to markets, and it is true that increased natural-gas generation could result in a need for greater gas pipeline capacity. The AEE Institute's analysis demonstrates, however, that while the Clean Power Plan may result in a temporary increase in natural gas demand, that increase is minimal—in the range of 3% to 7%—and existing and currently planned pipeline expansion can support that additional

[70] *See* Julie Osborn & Cornelia Kawann, Lawrence Berkley National Laboratory, *Reliability of the U.S. Electricity System: Recent Trends and Current Issues* (Aug. 2001), *available at* http://emp.lbl.gov/sites/all/files/REPORT%20lbnl%20-%2047043.pdf.

demand. Therefore increased natural gas utilization will not cause a significant increase in additional gas pipeline requirements.[71] That result is due, in part, to the fact that development of gas pipelines has already increased to support the growth of natural gas production from shale formations and demand by power generation.

79. And a large number of pipeline projects, initiated to meet this market demand, are already in the planning stages to expand capacity over the next few years.[72] Any minimal increases in natural gas demand, moreover, is unlikely to present reliability challenges, particularly in light of measures such as natural gas storage, gas demand response, and energy efficiency, which can further reduce the need for any pipeline expansion.[73]

80. In addition, EPA's calculation of the BSER, which develops regional targets and then chooses the least stringent target to be applied nationally, does not maximize the available potential in renewable energy resources or energy efficiency. Thus, there is more potential for EGUs to utilize the building blocks beyond what EPA used to calculate the BSER. Some regions of the country are capable of improving heat rates at existing coal-fired plants beyond BSER levels, and some regions may also incorporate greater levels of renewable energy (as well

[71] AEE Institute, Impacts of the Clean Power Plan on U.S. Natural Gas Markets and Pipeline Infrastructure, at ii.

[72] *Id.* at 12.

[73] *Id.* at 12-13.

as energy efficiency, which is not incorporated into the BSER).[74] Utilization of these advanced energy solutions would relieve potential constraints on natural gas pipelines.

D. EPA Has Adequately Addressed Reliability Concerns

81. In any event, in the Final Rule, EPA added provisions to specifically address any reliability concerns. To provide EGUs with additional time to prepare for compliance, EPA delayed the starting compliance date from 2020 to 2022. EPA also changed its calculations in developing the final target to allow for a slower build-out of new generation across the earliest interim target periods. These changes were made in direct response to questions about reliability noted in the comments EPA received on the Proposed Rule. EPA is also requiring states to demonstrate consideration of reliability issues in plan development, which may include consultation with energy regulatory agencies and reliability entities. In addition, EPA has developed a reliability safety valve that can be triggered for individual EGUs facing extraordinary situations that present reliability concerns.

[74] *See, e.g.*, AEE Institute, *NERC's Clean Power Plan 'Phase I' Reliability Assessment: A Critique,* at 10 (noting that some regions are already integrating higher levels of renewable energy capacity than contemplated by EPA's modeling); AEE Institute, *EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review*, at Table ES-1.

82. And aside from the three building blocks, EPA has also provided states with considerable flexibility in complying with the Clean Power Plan, allowing states to employ emission-reduction technologies not included in the BSER. Such technologies include co-firing coal with qualified biomass, demand response, combined heat and power, and energy efficiency measures.[75] Some of these compliance options explicitly *improve* system reliability. Demand response in particular has been shown to be useful in maintaining reliability, as it successfully aided the PJM regional transmission operator to maintain reliability during its all-time winter peak load during the January 2014 Polar Vortex event.[76] The variety of available measures, as well as the existence of tradeable emission credits, gives plants a diverse portfolio of resources to meet both the emission reduction targets set by the Clean Power Plan and reliability requirements.

[75] *See* AEE Institute, EPA's Clean Power Plan and Reliability: Assessing NERC's Initial Reliability Review, at 50.

[76] *See* PJM Interconnection, *Analysis of Operational Events and Market Impacts During the January 2014 Cold Weather Events* (2014), *available at* https://www.pjm.com/~/media/documents/reports/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx; AEE Institute, *NERC's Clean Power Plan 'Phase I' Reliability Assessment: A Critique*, at 5.

Affected EGUs Can Also Comply With The Clean Power Plan Through Emission-Trading Mechanisms

83. In determining the BSER, the EPA considered emission reductions that are achievable through state-set standards of performance that incorporate emission trading. 80 Fed. Reg. at 64,733. Emission-trading markets will likely develop quickly and will provide regulated power plants low-cost, flexible, and effective options to comply with the Clean Power Plan. Because such markets can be developed and utilized rapidly, Petitioners' claims of irreparable harm are flawed for this reason as well.

84. EPA recognized that some EGUs may be able to comply with the emissions limits more readily than others. Emission trading would therefore allow an affected EGU to achieve its emission limit by buying credits or allowances from other EGUs that have over-complied as well as from other low- or zero-emitting generation or demand-reducing measures. The Clean Power Plan facilitates such market-based options by providing detailed guidelines and model plans for states pursuing either intrastate or interstate trading.[77]

85. The Petitioners who challenge the Clean Power Plan argue that emission trading is not a feasible method of compliance, because sufficiently robust emission trading markets may not develop. *See*, *e.g.*, Doc. No. 1580014, at

[77] *See* 80 Fed. Reg. at 64,892, 64,910.

658 (Campbell Decl. ¶ 20). As the EPA explained in the Final Rule, however, it expects that "organized markets will develop so that owner/operators of affected EGUs that have invested in measures eligible for the issuance of [Emission Rate Credits] will be able to sell those credits and other affected EGUs will be able to purchase them."[78]

86. In making that determination, the EPA relied in part on the recent AEE Institute report entitled "*Markets Drive Innovation: Why History Shows that Clean Power Plan Will Stimulate a Robust Industry Response*" (2015), *available at* http://info.aee.net/hubfs/PDF/AEEI-Market-Response-Report.pdf?t=1436575590466 (hereinafter, "Markets Report").[79] Indeed, the Legal Memorandum accompanying the Clean Power Plan quotes the Executive Summary of that report in support of EPA's assertion that "it is reasonable to expect that organized markets will develop so that NGCC units and [renewable energy providers] can generate [Emission Rate Credits] that can be traded, which will facilitate compliance by affected EGUs."[80]

[78] 80 Fed. Reg. at 64,731.

[79] *See* 80 Fed. Reg. at 64,732 n.376 (citing Markets Report).

[80] EPA Legal Memorandum Accompanying Clean Power Plan for Certain Issues at 129-131, *available at* http://www.epa.gov/sites/production/files/2015-11/documents/cpp-legal-memo.pdf.

87. The AEE Institute's Markets Report examines the history of analogous EPA regulations in which the EPA has allowed EGUs and other sources to meet their emission limits by trading with other sources. Based on that analysis and the basic structure of the Clean Power Plan, the Markets Report concludes that the Clean Power Plan will lead to the development of a robust market for emission reduction measures during the compliance period, providing ample cost-effective compliance solutions.

88. The Markets Report focused on three EPA programs under the Clean Air Act that serve as relevant analogues for the type of market-based compliance mechanisms allowed under the Clean Power Plan. Those programs were designed to reduce: (1) lead content in gasoline; (2) sulfur dioxide ("SO_2") emissions; and (3) ozone and fine particulate matter. The successful development of efficient and active markets under these EPA programs is demonstrated by the widespread use of emissions trading by affected entities, the use of credit banking where available, market stability, and broad-based private sector participation. As a result of the flexibility provided by market mechanisms, compliance was achieved more quickly and affordably than policymakers had expected. I review these programs in further detail below and explain how they support EPA's determination that similar compliance mechanisms will develop under the Clean Power Plan.

89. *Lead in Gasoline*. EPA began a sustained effort to accelerate the phase-out of lead in gasoline starting in the mid-1970s. Pursuant to the Clean Air Act, EPA initially limited lead in gasoline through command-and-control regulations (*e.g.*, technology and refinery performance standards). Then, in 1982, EPA set a rate-based standard in grams per leaded gallon ("gplg"), and introduced a lead-credit trading program to accelerate the phase-out. To provide greater compliance flexibility and account for the difference in costs among refiners, EPA allowed refiners to buy and sell lead credits and to "bank" or hold such credits and apply them in future years.[81] The D.C. Circuit Court in 1983 upheld the rule. *See Small Refiner Lead Phase-Down Task Force v. U.S. EPA*, 705 F.2d 506 (D.C. Cir. 1983).

90. The market-based approach for regulation of lead was extremely successful. Refineries began to take advantage of the trading program immediately, with approximately 10% of all lead rights traded in the first quarter after the introduction of trading in 1983. Market activity grew steadily, with over

[81] *See* Richard G. Newell and Kristian Rogers, Resources for the Future, *The U.S. Experience with the Phasedown of Lead in Gasoline*, at 22 (June 2003), *available at* http://web.mit.edu/ckolstad/www/Newell.pdf.

50% of lead rights traded during the final quarter of the program in 1987.[82] Indeed, a study of the lead phasedown conducted by Richard Newell and Kristian Rogers concluded that the program was more successful than expected. According to Newell and Rogers, the program "accelerated the virtual elimination of lead in gasoline by at least a few years, reducing by 1988 an additional half-million tons over what the fleet turnover would have reduced."[83] Thus, market-based trading and banking of lead credits created an active market that accelerated lead reduction while reducing compliance costs.

91. *Sulfur Dioxide*. In 1990, Congress amended the Clean Air Act by adding Title IV to address the problem of acid rain, which is caused by emissions of sulfur dioxide and nitrogen oxide ("NO_x"). Most notably, Title IV of the Clean Air Act established a SO_2 cap-and-trade program for fossil fuel-fired utilities (through what is now known as the "Acid Rain Program"). The Acid Rain Program set a decreasing cap on SO_2 emissions, and allowed utilities to buy and sell emission permits, or "allowances." Sulfur dioxide allowances can be bought and sold on the open market or be banked to offset future emissions.

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[82] *See* Robert W. Hahn and Gordon L. Hester, *Marketable Permits: Lessons for Theory and Practice*, 16 Ecology L.Q, 361, 387 (1989), *available at* http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1353&context=elq.

[83] *See* Richard G. Newell and Kristian Rogers, Resources for the Future, *The U.S. Experience with the Phasedown of Lead in Gasoline*, at 22 (June 2003).

92. The Acid Rain Program's cap-and-trade system was successful in reducing SO_2 emissions immediately upon the start of the trading program in 1995. Indeed, a 2003 study concluded that "the reduction [in SO_2 emissions] from 1994 to 1995 was far greater than anything that had been seen before, and there can be no doubt that it was caused by Title IV," which authorized the cap-and-trade program.[84] "The only precedent for such a rapid reduction in emissions of this magnitude in the history of the Clean Air Act," the authors continued, "is the lead phase-down program, which was also implemented by the use of emissions trading and banking."[85] Because of the low transaction costs associated with trading, and the development of an active trading market, the SO_2 market-based trading program resulted in $20 billion in savings as compared to traditional command-and-control regulations.[86]

93. *Fine Particulate Matter and Ozone Pollution*. Emissions of sulfur dioxide and nitrogen oxide can form fine particulate matter pollution in the atmosphere. Nitrogen oxide emissions can also result in ozone pollution. When generated upwind, these pollutants can travel great distances and impact air quality

[84] *See* A. Denny Ellerman, Paul L. Joskow and David Harrison, Pew Center on Global Climate Change, *Emissions Trading in the US: Experience, Lessons, and Considerations for Greenhouse Gases*, at 14 (2003), *available at* http://web.mit.edu/globalchange/www/PewCtr_MIT_Rpt_Ellerman.pdf

[85] *Id.*

[86] *Id.* at 15.

in downwind locations, making it difficult for downwind states to meet their air quality standards for particulate matter and ozone. The Clean Air Act's "Good Neighbor" provision (Section 110(a)(2)(D)(i)) therefore requires EPA and states to address this interstate transportation of air pollution by prohibiting "any source" from discharging emissions that will contribute to nonattainment of air quality standards by downwind states. 42 U.S.C. § 7410.

94. EPA has promulgated three major rulemakings to address such regional transport of pollutants under the "Good Neighbor" provision. All of those rulemakings authorized emissions trading. In 1998, EPA promulgated the NO_x "SIP Call," which established an interstate NO_x cap-and-trade program as a means for states to reduce emissions from EGUs and other sources.[87] Then, in 2005, EPA finalized the Clean Air Interstate Rule ("CAIR"), which required 28 upwind states to reduce emissions of both NO_x and SO_2.[88] Like the SIP Call, CAIR encourages adoption of cap-and-trade programs and created a multi-state trading region. Finally, in 2011, EPA promulgated the Cross State Air Pollution Rule ("CSAPR"), which required deeper reductions in NO_x and SO_2 by upwind states.[89] Once again, emissions trading programs were a key mechanism for achieving necessary

[87] 63 Fed. Reg. 57,356 (Oct. 27, 1998).

[88] 70 Fed. Reg. 25,162 (May 12, 2005).

[89] 76 Fed. Reg. 48,208 (Aug. 8, 2011).

reductions in emissions of those pollutants and, once again, these markets developed quickly, starting with the regional Ozone Transport Commission ("OTC") trading program that preceded and later merged with the federal NO_x trading program. According to Ellerman, Joskow and Harrison, approximately 16% of allowances issued during the first year of the program "were traded among economically distinct entities and a slightly larger percentage . . . were reallocated among units owned by the same firm."[90]

95. As the AEE Institute explained in its Markets Report, the trading programs implemented under these regional transport rules have been remarkably successful in reducing emissions in a cost-effective manner. EPA's 2012 Progress Report on its allowance trading programs reported that SO_2 emissions were 68% below their 2005 levels, and NO_x were 37% below their 2005 levels.[91] All facilities reporting to the EPA were in full compliance with the emissions requirements, in large part because of the trading programs. And, while emissions dropped, total electricity generation increased—while electricity prices remained stable.

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[90] *See* A. Denny Ellerman, Paul L. Joskow and David Harrison, Pew Center on Global Climate Change, *Emissions Trading in the US: Experience, Lessons, and Considerations for Greenhouse Gases*, at 31 (2003).

[91] U.S. EPA, 2012 Progress Report: SO_2 and NOx Emissions, Compliance and Market Analyses, at 14 (2013).

96. The emissions trading programs have also been credited with spurring the development of cost-saving technological innovations that would not have occurred under a command-and-control regulation.[92] The successful and cost-effective reductions under both CAIR and CSAPR occurred in flexible programs allowing states to achieve emission reductions through "beyond-the-fence-line" measures, including renewable energy and energy efficiency.[93] In addition, states under CAIR had the option to establish set-asides for renewable energy and energy efficiency, while states under CSAPR had flexibility to allocate allowances to renewable energy.[94]

97. These prior regulatory programs offer strong evidence that industry responds rapidly and effectively to regulatory signals set by EPA when market-based compliance mechanisms are allowed, thereby enabling the development and delivery of a wide array of compliance solutions at low cost. As explained in the AEE Institute's Markets Report, there is every reason to believe that the Clean Power Plan will adhere to this same pattern. Although states do not need to adopt any particular compliance option, states may rely on trading of emission reduction

[92] *See* Dallas Burtraw and Sarah Jo Szambelan, Resources for the Future, *U.S. Emissions Trading Markets for SO_2 and NO_x*, at 26 (Oct. 2009), *available at* http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-09-40.pdf.

[93] *See* 70 Fed. Reg. 25,162; 25,165; 25,256; 25,279 (May 12, 2005) (CAIR); 76 Fed. Reg. 48,208; 48,209-48,211; 48,319 (Aug. 8, 2011) (CSAPR).

[94] *See* 70 Fed. Reg. at 25,279 (CAIR); 76 Fed. Reg. at 48,327-48,328 (CSAPR).

credits and other market-based mechanisms to comply with the Clean Power Plan. And, as AEE explained in its study entitled *Design Principles for a Rate-Based Federal Plan Under EPA's Clean Power Plan*, *available at* http://info.aee.net/rate-based-federal-plan-under-clean-power-plan, if a state elects not to submit a plan to the EPA, the EPA can adopt a market-based approach under a federal Plan. Indeed, EPA has proposed using market-based trading programs in the federal Plan.

98. States and EGUs currently make use of many market-based mechanisms—including credit-trading systems—to meet policy requirements and electricity needs. For example, as described above, many fossil fuel-fired EGU owners also own renewable energy generating resources, contract for renewable energy, procure renewable energy through bilateral contracts, purchase renewable energy credits ("RECs"), run or fund programs to reduce customer demand, or provide energy efficiency services. This market activity spans across different utility types, including investor-owned utilities, municipal utilities, and cooperative utilities; across different market structures, both regulated and deregulated; and either extends or could extend to independent power producers or merchant

generators.[95] These existing markets can readily be adapted to facilitate compliance with the Clean Power Plan.

99. In addition, modeling conducted by regional transmission organizations (which operate electricity transmission systems) shows that interstate emission trading platforms can facilitate inexpensive compliance options. For example PJM Interconnection has stated that "the Clean Power Plan can be seen as another policy choice to which the markets will react. . . . Whether a cap and trade system is developed on a regional basis or units simply have to bid their individual compliance costs, the market provides a sorting function that allows the least cost solutions to emerge."[96]

100. Indeed, the Clean Power Plan has already stimulated a concerted effort by third-party experts, and data-system providers to amend existing tracking and accounting systems so that they can support emissions trading programs under the Clean Power Plan. In May 2015, for example, APX, an infrastructure provider for environmental markets in greenhouse gases, announced that a "North American Renewables Registry ("NAR") will be adding key features to support state

[95] For more detail and examples, see: Advanced Energy Economy, *AEE Supplemental Comments on EPA's Clean Power Plan* (Dec. 1, 2014), *available at* http://info.aee.net/clean-power-plan-comments.

[96] Statement of Michael J. Kormos to the Federal Energy Regulatory Commission, Dkt. No. AD15-4-000, at 3 (Feb. 19, 2015), *available at* http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13764999.

implementation efforts for the US EPA Clean Power Plan. With the new features NAR will serve as a viable prototype of what we believe is necessary for cost-effective market-based solutions to implement the Clean Power Plan."[97]

101. Thus, as demonstrated by the extensive track record of previous EPA emission reduction programs allowing market-based compliance mechanisms, and states' and EGUs' current use of market-based compliance programs, the Clean Power Plan is likely to quickly spark widespread participation in markets for emission reduction credits that will provide Clean Power Plan-regulated power plants with a broad spectrum of low cost, flexible compliance strategies. Together, this evidence rebuts Petitioners' claims of irreparable harm predicated on the assumption that markets for emission reduction measures under the Clean Power Plan will be weak or slow to develop.

A Stay of the Clean Power Plan Would Harm Advanced Energy Companies And Slow Deployment Of Clean And Renewable Sources

102. As I discussed in my prior declaration offered in support of AEE's motion to intervene in this litigation, AEE expects that the Clean Power Plan will accelerate the already growing market for advanced energy technologies and

[97] North American Renewables Registry, *The North American Renewables Registry Adds Functionality to Support Clean Power Plan Implementation* (May 13, 2015), *available at* http://www.narecs.com/2015/05/13/the-north-american-renewables-registry-adds-functionality-to-support-clean-power-plan-implementation/.

services, which is currently a global $1.3 trillion annual market, per AEE's *Advanced Energy Now 2015 Market Report* (*available at* http://info.aee.net/aen-2015-market-report). The Clean Power Plan allows states and EGUs to employ a wide range of advanced energy resources to achieve required emission reductions, including wind power, solar power, natural gas power, end-use energy efficiency, nuclear power, and transmission and distribution efficiency. These advanced energy technologies not only provide cost-effective emission reductions, but also provide capabilities that will help modernize the electricity system to provide better resiliency and reliability, diversity, cost effectiveness and economic opportunity. Given these benefits, states and EGUs have a strong incentive to utilize advanced energy resources for compliance.

103. AEE's member companies develop and deploy the advanced energy technologies and services that will be used for compliance under the Clean Power Plan, and therefore will benefit directly from the accompanying accelerated use of these resources. Based on AEE's internal calculations and analyses of the Proposed Rule, AEE estimated that, from the beginning of the compliance period, the Clean Power Plan will support roughly $20 billion per year in advanced energy market activity through 2030.

104. A delay of the Clean Power Plan, in contrast, would slow market trends already in favor of the advanced energy industry. Advanced energy

technologies already have a significant market share that is on a growth trajectory. According to the U.S. Federal Energy Regulatory Commission's *Energy Infrastructure Update For September 2015* (*available at* http://www.ferc.gov/legal/staff-reports/2015/sep-infrastructure.pdf), advanced energy solutions composed over 98 percent of new generation capacity added in the first nine months of 2015. The Clean Power Plan provides a new market signal that will hasten that growth. A stay of the Clean Power Plan would not only dim market growth opportunity for the advanced energy industry, but it would also create uncertainty in the existing market for advanced energy technologies.

105. Furthermore, states and EGUs are additionally incentivized under the Clean Power Plan to deploy renewables and energy efficiency once state implementation plans are submitted to EPA (or once EPA puts in place a federal implementation plan in a state) under the Clean Energy Incentive Program ("CEIP"). The program allows energy-efficiency projects in low-income communities and metered wind and solar power projects to generate credits for emission reductions achieved in 2020 and 2021 that states and EGUs can bank for use during the compliance period. EPA is providing some of these projects with bonus credits to further incentivize early project activity. A stay of the Clean Power Plan that delayed submission of state plans would delay construction (and thus generation), thereby precluding some projects from earning CEIP credits.

Dated: December 7, 2015

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