

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: STATE LEADERSHIP & RANKINGS

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EXECUTIVE SUMMARY

The *Corporate Clean Energy Procurement Index: State Leadership & Rankings* was created to guide members of the Retail Industry Leaders Association (RILA) and Information Technology Industry Council (ITI) and others in their efforts to boost renewable energy (RE) usage across their operations in the United States. While created on behalf of RILA and ITI, the index is broadly applicable to many stakeholders, including other business sectors, the military, higher education, and state and local government. It is intended to assist policymakers and large RE buyers in advancing policies that help, not hinder, RE development, and help large RE buyers to select states in which they may make RE investments.

Businesses and other large organizations have never had greater ability to purchase or produce RE. In 2015, commercial and industrial (C&I) buyers accounted for greater than half of all signed wind energy power purchase agreements (PPAs), outpacing utilities. The C&I market is now around five gigawatts (GW) of contracted wind and solar power, with commercial customers intending to procure an additional 60 GW by 2025, according to the Renewable Energy Buyers

Alliance (REBA). This report highlights a number of companies at the forefront of these developments — including Amazon, Facebook, Google, Microsoft, Target, and Walmart — for their efforts to install both onsite and offsite renewables and create jobs.

The growth of state policies and regulations that help enable corporations to procure RE – or remove barriers to doing so – is a key factor fueling this momentum. But states vary widely when it comes to the policy landscape. Some state electricity market structures enable more customer choice, a strong desire of many large buyers. States that limit customer choice can see higher RE costs, making their markets less attractive. That means the structure of a state’s electricity market can directly influence where corporations choose to invest in renewable projects, and in which states they decide to expand their operational footprint.

The index ranks all 50 U.S. states based upon the ease with which companies can procure RE for their operations located within each state. The index consists of 15 indicators, broken into three categories: Utility Purchasing Options, Third-Party Purchasing Options, and Onsite/Direct Deployment Options.



-  **1** IOWA
-  **2** ILLINOIS
-  **3** NEW JERSEY
-  **4** CALIFORNIA
-  **5** TEXAS
-  **6** MASSACHUSETTS
-  **7** NEW YORK
-  **8** OHIO
-  **9** RHODE ISLAND
-  **10** CONNECTICUT
-  **11** MARYLAND
-  **12** DELAWARE
-  **13** NEW HAMPSHIRE
-  **14** MAINE
-  **15** PENNSYLVANIA
-  **16** OREGON
-  **17** NEVADA
-  **18** VERMONT
-  **19** OKLAHOMA
-  **20** VIRGINIA

OVERALL INDEX RESULTS

Iowa leads the index rankings with an overall score of 74.73, nearly six points ahead of Midwest neighbor #2 Illinois's 68.79. The Hawkeye State is #1 in the Utility Purchasing category and #10 in Third-Party Purchasing, although just tied for 21st in Onsite/Direct Deployment, with no corporate onsite solar or direct investment procurement deals. But offsite utility-scale deployment is a big strength; Iowa joins Oklahoma, Virginia, and North Carolina as the only states with measurable deployment via both green tariffs/direct utility purchases (548 MW in Iowa) and offsite PPAs (114 MW). Rounding out the top five states is a coast-to-coast trio of #3 New Jersey, #4 California, and #5 Texas.

The Northeast, Midwest, and Mid-Atlantic are generally the most favorable regions in the U.S. for corporate customers seeking to power their operations with renewable energy, according to the results of the index. The Northeast, driven by supportive policies and comparatively high energy prices making RE more attractive, tallies eight states in the top 20 – all six New England states plus #3 New Jersey and #7 New York. The Midwest captures the top two places in the index with Iowa and Illinois scoring strongly in both deployment and policy indicators, while Ohio places eighth. Eleventh-place Maryland, #12 Delaware, and #15 Pennsylvania represent the Mid-

Atlantic region. High-ranking regional leaders from other parts of the U.S. include #4 California and #5 Texas. The Southeast trails the rest of the U.S., with #20 Virginia and #30 North Carolina placing the highest.

The availability of retail choice is a critical factor for a state's attractiveness to corporate and other large institutional buyers of RE. States that wish to gain the job creation and economic development benefits of corporate RE-powered facilities should encourage their policymakers and regulators to enable customer choice. Nonetheless, companies in some fully regulated states, such as Iowa, have successfully worked with the dominant utility to create notable corporate RE opportunities, sometimes through green tariffs.

Beyond market structure and customer choice, other specific policies have a significant impact on corporate buyers' location decisions. Among these are the allowance of onsite and offsite third-party PPAs and leases; strong net metering requirements for onsite solar photovoltaic (PV) generation; policies/regulations that ease the interconnection of distributed generation (DG) systems to the grid; and not allowing utilities to impose fixed charges on C&I customers for DG.

FIVE-POINT STATE ACTION PLAN

There are a number of actions that governors, legislators,

regulators, utilities, third-party providers, and corporations themselves can take to support the procurement of renewable energy by large institutional customers. Perhaps more than anything else in this report, corporate customers are looking to control their own destiny by leveraging a landscape of customer choice, especially as many of them work to power their operations with 100% renewable energy.

While there is no one-size-fits-all solution, the following actions at the state level would go a long way in supporting the growth of corporate renewables procurement (see pages 33-34 or [click here](#) for the full action plan).

- 1 Remove barriers to corporate deployment of both onsite and offsite renewable installations.
- 2 Support the development of next-generation options to purchase renewable energy through utilities in regulated markets.
- 3 Expand energy choice options for C&I customers in regulated markets.
- 4 Ensure that an adequate market exists for renewable purchasing through both utilities and third-party programs.
- 5 Ensure that RE in both regulated and deregulated markets can scale up rapidly.

INTRODUCTION

Businesses have never had greater ability to purchase or produce renewable energy (RE). It is now possible for corporations to set, and reach, ambitious RE goals, and the movement is accelerating rapidly. Nearly half of Fortune 500 companies have made renewable, greenhouse gas, and/or energy efficiency commitments, according to the *Power Forward 2.0* report. In 2015, commercial and industrial (C&I) buyers accounted for greater than half of all signed wind power PPAs, outpacing utilities for the first time. The C&I market is now around five GW of contracted wind and solar power, with commercial customers intending to procure an additional 60 GW by 2025, according to the Renewable Energy Buyers Alliance (REBA).

Corporate RE procurement is rapidly gaining momentum due to a number of key factors, including the falling costs of solar and wind energy, expanding and more aggressive corporate sustainability goals, and the growing ability for corporations to hedge their energy costs against fossil fuel price volatility. In the United States, the growth of state policies and regulations that help

enable corporations to procure RE – or remove barriers to doing so – is another factor fueling this momentum.

But states are not equal when it comes to the policy landscape. The state-level policies and regulations in place create different electricity market structures. Some state markets enable more customer choice, a strong desire of many large buyers. States that limit customer choice can see higher RE costs, making their markets less attractive. That means the structure of a state's electricity market can directly influence where corporations choose to invest in renewable projects, and in which states they decide to expand their operational footprint.

The *Corporate Clean Energy Procurement Index: State Leadership & Rankings* was created to guide members of the Retail Industry Leaders Association (RILA), the Information Technology Industry Council (ITI), and others in their efforts to boost RE usage across their operations in the United States. While created on behalf of RILA and ITI, the index is broadly applicable to many other stakeholders, including other business sectors, the military, higher education, healthcare,

and state and local government. It is intended to assist policymakers and large RE buyers in advancing policies that help, not hinder, RE development. It can also help large RE buyers to select states in which they may make RE investments. These investments, in turn, drive broader societal benefits, such as job growth, increased tax revenue, and lower air emissions.

The index ranks all 50 U.S. states based upon the ease with which companies can procure RE for their operations located within each state. The index consists of 15 indicators, broken into three categories:

- **UTILITY PURCHASING OPTIONS**, which ranks states based upon the opportunities available to procure RE through utilities in the state, as well as looking at electric utility market factors
- **THIRD-PARTY PURCHASING OPTIONS**, where states are ranked by how readily companies can procure RE through third-party (i.e., non-utility) developers and other organizations

- **ONSITE/DIRECT DEPLOYMENT OPTIONS**, which analyzes states based upon how effectively companies can deploy RE onsite (such as rooftop solar panels) or through other direct purchasing options

The index is structured in this manner for several reasons. The categories generally group similar indicators together; for instance, the Third-Party Purchasing category includes indicators that directly impact (or are impacted by) the ways in which states allow non-utility actors to participate in the marketplace. The indicators were chosen because they have a direct impact on how large electricity customers, such as RILA and ITI members, procure RE, though each constituency focuses on different things. ITI members, for example, tend to have large loads and are interested in policy measures that incentivize switching those large loads to RE, whereas RILA members are more interested in policies that encourage moving smaller, distributed loads to RE. The index strikes a balance between indicators that encourage both types of installations, while also factoring in some overall market considerations, such as whether a state offers retail electricity choice or operates in an organized electricity market. The latter two measures are particularly important in ensuring dynamic, cost-effective electricity markets.

The indicators in this index are a subset of many factors influencing RE deployment. They are included as the factors that most directly impact the ability of large customers, such as RILA and ITI members, to acquire renewable energy, and exclude some state policies such as renewable portfolio standards (RPS), which aim to expand renewable energy for all customers in a state. The index also excludes some items due to a lack of available or reliable data. Grading states on the quality and price of their green tariffs, for instance, is outside the scope of the index because green tariffs are both uncommon and fairly new programs. Additional data could improve future iterations of the index.

The following sections detail the overall results of the index, and then delve into how states rank in each of the three categories, while also discussing some of the policies and tools that have been important to corporate and other institutional RE procurement. Three case studies look at how certain states are enacting policies (or, conversely, erecting roadblocks) that aid corporations in their efforts to procure RE. Finally, the index features an action plan for states to enable greater customer choice, assist businesses in meeting their RE goals and to encourage those businesses to invest in RE development in their states.

INDEX CATEGORIES AND COMPONENTS

UTILITY PURCHASING OPTIONS

- Green Tariff/Direct Utility Purchase Deployment
- Existence of Green Tariff
- Green Power Purchase Option
- C&I Retail Choice
- Presence of an ISO/RTO

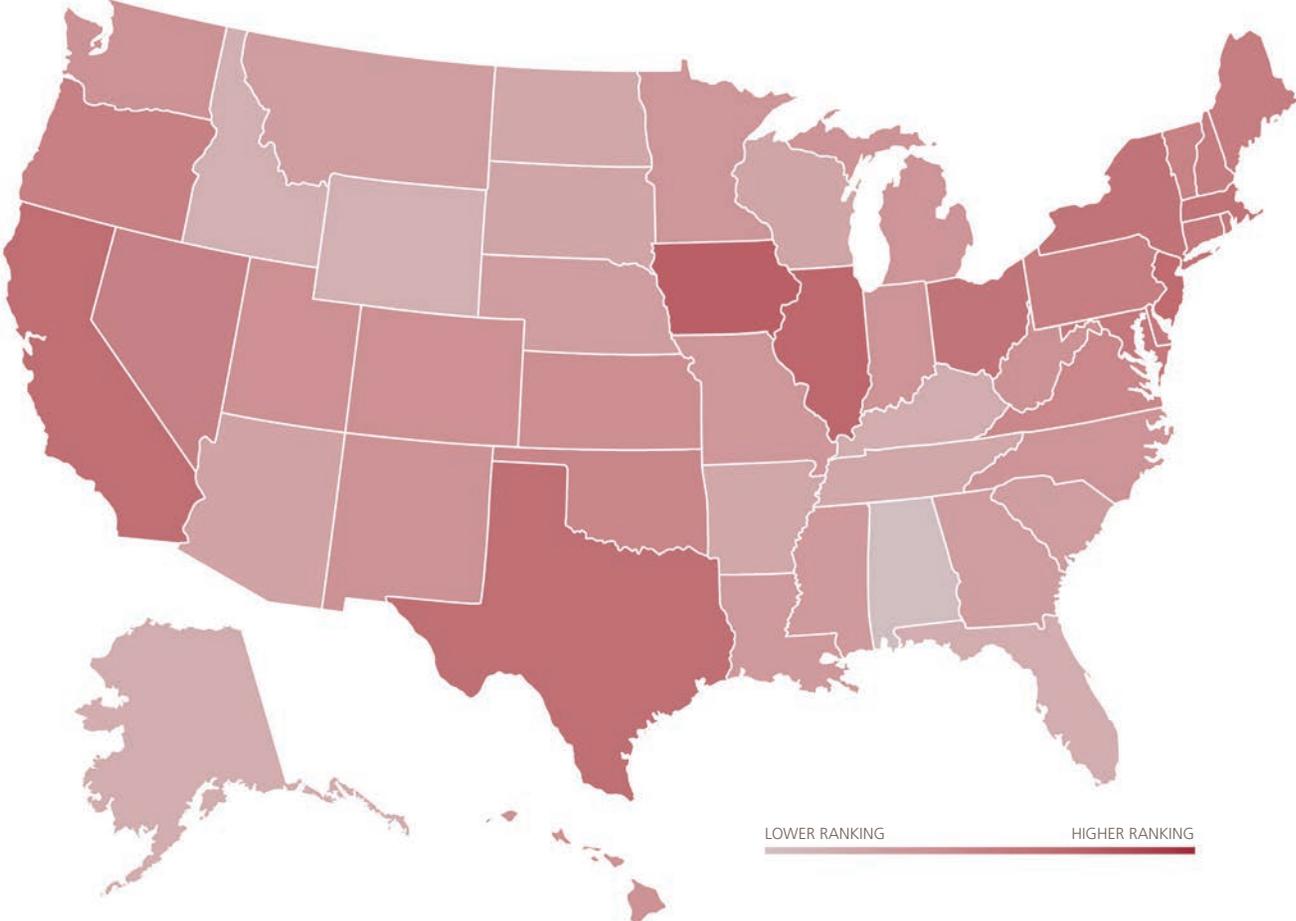
THIRD-PARTY PURCHASING OPTIONS

- Third-Party Utility-Scale Offsite (Wind/Solar PPA) Deployment
- Third-Party Onsite PPAs for Distributed Generation
- Third-Party Onsite Leases for Distributed Generation
- Community Renewables
- Community Choice Aggregation

ONSITE/DIRECT DEPLOYMENT OPTIONS

- Onsite Solar Deployment
- Direct Investment Procurement
- DG Fixed Charges
- Interconnection
- Net Metering

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: OVERALL RESULTS



RANK	STATE	INDEX SCORE
1	Iowa	74.73
2	Illinois	68.79
3	New Jersey	66.65
4	California	65.24
5	Texas	63.50
6	Massachusetts	60.64
7	New York	60.13
8	Ohio	59.66
9	Rhode Island	57.28
10	Connecticut	56.49
11	Maryland	56.04
12	Delaware	54.93
13	New Hampshire	53.31
14	Maine	52.95
15	Pennsylvania	51.53
16	Oregon	50.98
17	Nevada	49.99
18	Vermont	48.55
19	Oklahoma	46.18
20	Virginia	44.98
21	Kansas	40.09
22	Colorado	39.01
23	Utah	37.60
24	New Mexico	37.39
25	Hawaii	37.01
26	West Virginia	36.43
27	Washington	36.43
28	Indiana	35.30
29	Michigan	35.06
30	North Carolina	34.81
31	Minnesota	33.42
32	Missouri	31.56
33	Louisiana	29.93
34	Mississippi	29.56
35	Montana	27.42
36	South Carolina	27.34
37	Georgia	27.24
38	Nebraska	26.51
39	Arizona	24.33
40	Wisconsin	21.94
41	South Dakota	21.91
42	Arkansas	20.43
43	North Dakota	19.95
44	Tennessee	19.74
45	Florida	15.78
46	Kentucky	15.71
47	Alaska	15.56
48	Idaho	13.60
48	Wyoming	13.60
50	Alabama	1.82

OVERVIEW

States of all political stripes continue to advance renewable generation at an increasing pace. Nearly half of all states – 22 – counted wind, solar, or geothermal energy as one of their top three sources of electricity generation in 2015, according to the Energy Information Administration (EIA). That figure has grown from zero in just over a decade; 2003 was the first year when wind reached the #3 generation source in three states – Iowa, New Mexico, and Wyoming. Wind is now the #2 energy source in five states, including Iowa and Kansas, which clock in at 31% and 24% respectively in 2015; they are two of nine states exceeding 15% of utility-scale generation from wind, solar, or geothermal last year.

In this game-changing transition from conventional sources to clean energy, corporations and other large organizations seeking to meet their RE goals by purchasing and deploying renewables have unprecedented options. But the transition is a bumpy one, with an ever-changing landscape of policy, finance, and technology factors at the state level. On the policy side, it is state energy and utility regulations, and the availability of customer choice, that are most important in determining the best locations for corporations seeking to buy or build significant amounts of renewable energy generation.

The *Corporate Clean Energy Procurement Index: State Leadership & Rankings* finds a wide range of progress among the states on policies related to corporate acquisition of renewables. Some policies, like allowing third-party Power Purchase Agreements (PPAs) and C&I customer choice, are fairly widespread, while others such as utility green tariffs are very limited. Based on the changes occurring in the market, it's reasonable to expect that the momentum of corporate investment in RE will only increase in coming years, and the state policies that allow or encourage that trend will expand and improve as well in the near future. Progress will ultimately depend on policymakers clearly understanding the economic and environmental benefits achieved by those states that have implemented strong RE and customer choice policies.

RESULTS

HIGHEST SCORING STATES. Iowa leads the index rankings with an overall score of 74.73, nearly six points ahead of Midwest neighbor Illinois's 68.79. The Hawkeye State is #1 in the Utility Purchasing category (also by a wide margin) and #10 in Third-Party Purchasing, although just tied for 21st in Onsite/Direct Deployment, with no onsite solar or direct investment procurement deals. But offsite deployment is a big strength; Iowa joins Oklahoma, Virginia, and North

Carolina as the only states with measurable deployment via both green tariffs/direct utility purchases (548 MW in Iowa) and offsite PPAs (114 MW). Rounding out the top five states is a coast-to-coast trio of New Jersey, California, and Texas. All three are national leaders in corporate RE deployment: New Jersey in onsite solar, Texas in offsite PPAs, and California in both.

REGIONAL PROGRESS. The Northeast, Midwest, and Mid-Atlantic regions are generally the most favorable regions in the U.S. for corporate customers seeking to power their operations with renewable energy, according to the results of the index. The Northeast, driven significantly by supportive policies and comparatively high energy prices making RE more attractive, tallies eight states in the Top 20. These include all six New England states (with #6 Massachusetts the highest), plus #3 New Jersey and #7 New York. The Midwest captures the top two places in the index with Iowa and Illinois scoring strongly in both deployment and policy indicators, while Ohio places eighth. Eleventh-place Maryland, #12 Delaware, and #15 Pennsylvania represent the Mid-Atlantic region. High-ranking regional leaders from other parts of the U.S. include #4 California and #5 Texas. The Southeast trails the rest of the U.S., with #20 Virginia and #30 North Carolina placing the highest.

POLICY CHECKLIST

	Overall Index Rank	Existence of Green Tariff	Green Power Purchase Option	C&I Retail Choice	Presence of an ISO/RTO	Third-Party PPAs for DG	Third-Party Leases for DG	Community Renewables	Community Choice Aggregation	DG Fixed Charges	Interconnection Law/Policy	Net Metering Law/Policy			
IA	1	●		●	●	●		●	3	3					
IL	2	◐	●	●	●	●		●	4	3					
NJ	3	●	●	●	●	●		●	3	4					
CA	4	◐	◐	●	●	●	●	●	4	4					
TX	5	◐	●	●	●	●		●	1	0					
MA	6	◐	●	●	●	●	●	●	4	4					
NY	7	◐	●	●	●	●	●	●	4	4					
OH	8	◐	●	●	●	●	●	●	4	4					
RI	9	◐	●	●	●	●	●	●	3	4					
CT	10	●	●	●	●	●	●	●	3	4					
MD	11	◐	●	●	●	●	●	●	3	4					
DE	12	●	●	●	●	●	●	●	3	4					
NH	13	◐	●	●	●	●	●	●	3	4					
ME	14	●	●	●	●	●	●	●	3	3					
PA	15	◐	●	●	●	●		●	3	4					
OR	16	●	●		●	●	●	●	4	4					
NV	17	●	◐	◐	●	●			3	0					
VT	18		●		●	●	●	●	3	4					
OK	19		◐		●			●	0	0					
VA	20	●	●		●	●		●	4	2					
KS	21		◐		●	●		●	0	2					
CO	22		●		●	●		●	3	4					
UT	23	●	◐			●		●	4	4					
NM	24	●	●		●	●			4	3					
HI	25		◐		●	●	●	●	4	0					
WV	26							●			●		●	3	4
WA	27		●					◐	●	●			●	3	3
IN	28		◐			●		◐					●	3	3
MI	29		◐	◐		●		●	●					2	3
NC	30	●	◐											4	2
MN	31		◐			●		◐	●	●				2	4
MO	32		◐			●		◐	●				●	0	3
LA	33					●		◐	●				●	0	3
MS	34		◐			●		◐	●				●	2	0
MT	35		●	●				◐					●	2	2
SC	36		◐						●				●	3	3
GA	37		◐	◐				●	●				●	0	0
NE	38		◐			●		◐					●	0	3
AZ	39		◐						●				●	0	4
WI	40		◐			●		◐					●	1	1
SD	41		◐			●		◐					●	2	0
AR	42					●							●	0	4
ND	43		◐			●		◐					●	0	1
TN	44		◐					◐	●				●	0	0
FL	45		◐										●	1	3
KY	46		◐										●	1	3
AK	47		◐					◐					●	0	2
ID	48		◐					◐					●	0	1
WY	48		◐					◐					●	0	1
AL	50		◐											0	0

Source: Center for the New Energy Economy (CNEE), the Database of State Incentives for Renewables and Efficiency (DSIRE), the Energy Information Agency (EIA), EQ Research, the Federal Energy Regulatory Commission (FERC), the Interstate Renewable Energy Council (IREC), LEAN Energy US, Vote Solar, World Resources Institute, and Clean Edge research. Note: For calculation purposes, Green Power Purchase Option, Community Renewables, and Community Choice Aggregation receive half credit in the index scoring.

FACTORS DRIVING THE RESULTS

UTILITY MARKET STRUCTURE AND PROCUREMENT POLICIES. Without question, a state's electric utility market structure and availability of retail energy choice is a big determinant of attractiveness for corporate RE procurement, and of performance in this index. States with fully or partially deregulated electricity markets – those that allow retail choice for C&I customers – have a big advantage. Of the top 20 states in this index, 14 receive full credit for having C&I retail choice. The most notable exception among the index leaders is Iowa, the index's #1 overall state. Iowa's strong corporate RE deployment levels show that even in a regulated state, a utility strongly committed to RE, in this case Mid-American Energy, can create large RE procurement deals as it has with Google and Facebook (see details in the Utility Purchasing category section on page 15). This is shown to a lesser extent with notable levels of corporate RE deployment in other Top 20 states that are partially or fully regulated: #17 Nevada, #20 Virginia (which both have green tariffs, a special rate structure that allows a C&I customer to obtain RE directly through its utility), and #19 Oklahoma.

A state's participation in an independent system operator (ISO) or regional transmission organization (RTO) is also a key attractiveness factor; regional electricity markets offer companies more options in their quest to procure RE.

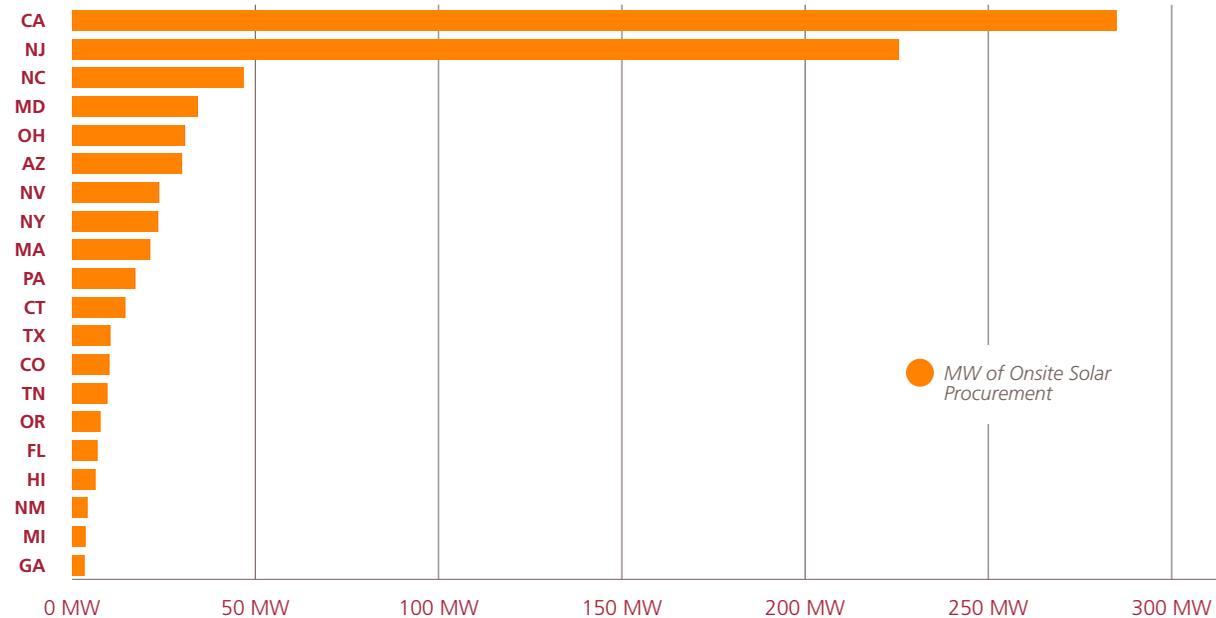
Only two of the top 20 states, #17 Nevada and #16 Oregon, do not participate in such a regional grid. (There is an effort underway in the West to bring both states into the California ISO [CAISO], but it is likely several years off, if it succeeds. A small portion of rural western Nevada is part of CAISO, but not enough for the state to receive credit in the indicator.) Of the 30 lower-ranking states, just 13 are in an ISO or RTO.

THIRD-PARTY PURCHASING POLICIES. On policies that allow or incentivize third-party purchasing, the top overall states perform consistently well. With the exception of #19 Oklahoma, all of the 27 highest ranking states allow third-party leases, and each of the top 18 receive credit for allowing both third-party onsite PPAs and leases. The community energy-related policy indicators are a bit more sporadic. Fourteen states require utilities to offer community renewables (which generally mean community solar farms), but that group includes just five of the top 10 overall states: California, Massachusetts, New York, Rhode Is-

land, and Connecticut. Only seven states have passed legislation allowing a community choice aggregation (CCA) option, but they are all in the overall top 10: Illinois, New Jersey, California, Massachusetts, New York, Ohio, and Rhode Island.

ONSITE/DIRECT DEPLOYMENT POLICIES. Policy indicators in the Onsite/Direct Deployment category also help propel most of the top overall states to their high index scores. Nineteen of the top 20 states, and 26 of the top 28, have not allowed their utilities to impose fixed charges on C&I customers who use onsite distributed generation (DG), thus earning the credit in this index measure (the exceptions are #17 Nevada and #24 New Mexico). The interconnection and net metering policy indicators offer grades from 0 to 4 (which were derived from the A through F grades assigned to each state by the independent Freeing the Grid report) rather than a simple either yes or no score, and here too the top overall states show strength. For policies/regulations that ease the interconnection of DG systems to the grid, all but two (#5 Texas and #19 Oklahoma) of the top 20 states receive a grade of 3 or 4. By contrast, among states with the lowest overall scores, only one state ranked #32 or lower in the index receives a grade better than 2 on interconnection

CORPORATE ONSITE SOLAR DEPLOYMENT BY STATE (IN MW)



Source: SEIA. Data current through November 2015.

policies (#36 South Carolina with a 3), and a dozen of those 19 states get a grade of zero.

The policy of net metering – requiring a state’s utilities to provide customers retail credit for excess electricity generated by onsite DG systems – is a critical state policy issue for solar customers of any kind. In this index, the net metering indicator is indeed a big determinant of strong performance. Twelve of the

overall top 16 states receive the highest grade of 4, and three (#1 Iowa, #2 Illinois, and #14 Maine) get a 3. Texas is once again the policy outlier, receiving a zero grade. A few low-ranked states show strong net metering policies with grades of 4, including #26 West Virginia, #31 Minnesota, #39 Arizona (where the policy has been challenged several times, but upheld so far), and #42 Arkansas.

Besides Texas, #17 Nevada and #19 Oklahoma are the only other top 20 states with a zero grade for net metering. Nevada regulators reduced the state’s net metering rates (while instituting fixed charges) in a controversial move in late 2015, effectively ending the distributed solar industry in that high solar resource state. Although Nevada’s green tariff policy has spurred 249 MW of green tariff deals (most in the U.S.), retail and tech industries like having the option to choose between both offsite renewables and onsite DG. There are encouraging signs for the future, as the state agreed in September 2016 to grandfather existing distributed photovoltaic (PV) customers to receive net metering credits, and a governor’s task force is studying the policy for possible revisions for new customers.

ONSITE AND OFFSITE PROCUREMENT. Among the index’s four deployment indicators, corporate onsite solar procurement and offsite procurement (wind and solar PPAs) correlate most closely with overall leadership. Eleven of the top 20 overall states are also in the top 20 in onsite solar. New Jersey, the #3 state overall, leads the field in this indicator by a wide margin, with 1.21% of its statewide generating capacity coming from onsite solar as of the end of 2015; no other state tops 0.4%. New Jersey’s total 225.6 MW of onsite solar procurement trails only the 285 MW of California, a state more

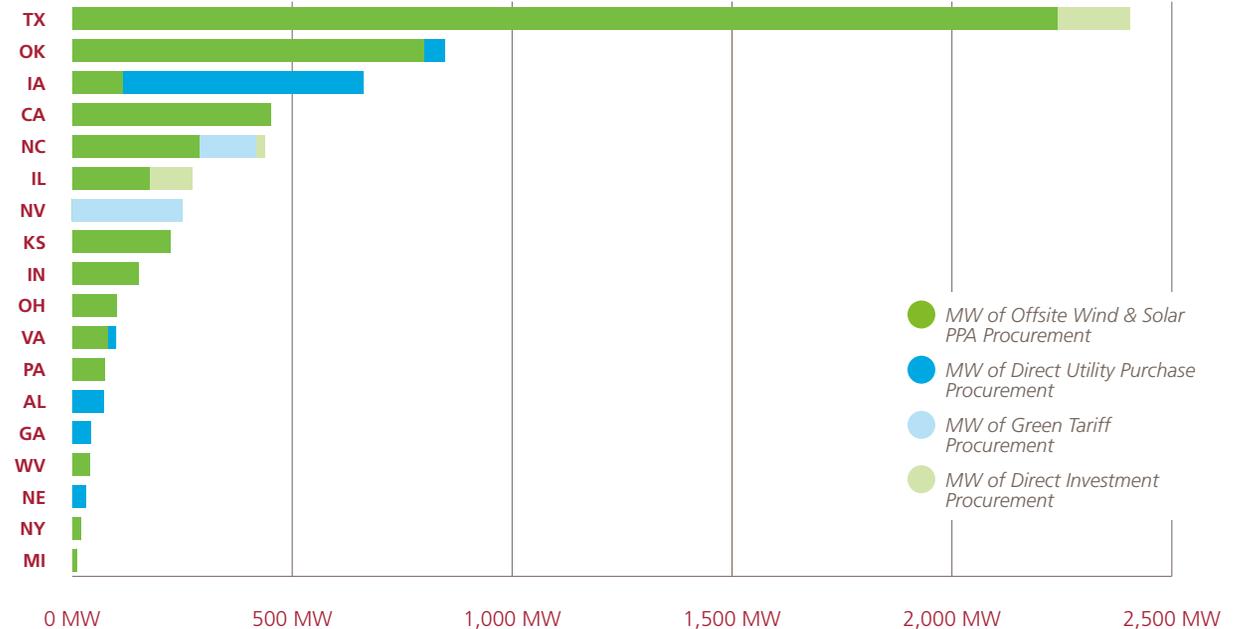
than 18 times its size in square miles. Retail stores and corporate campuses in New Jersey team with solar roofs and arrays, with facilities of FedEx, McGraw-Hill, Staples, Target, and Toys R Us among them; Target aims to reach 500 onsite solar installations across the U.S. by 2020.

Only 14 states have at least one MW of wind or solar procurement through corporate offsite PPAs, and nine of them are in the overall top 20, including four of the overall top five (Iowa, Illinois, California, and Texas). But #19 Oklahoma leads this indicator by a wide margin with such PPAs (all wind) accounting for 3.22% of the state's overall electricity capacity. Texas is second at 1.91%, with by far the most total capacity, more than 2,200 MW, coming from offsite wind PPAs.

LESSONS LEARNED

The availability of retail choice is a critical factor for a state's attractiveness to corporate and other large institutional buyers of RE. States that wish to gain the job creation and economic development benefits of corporate RE-powered facilities should encourage their policymakers and regulators to enable customer choice. Nonetheless, companies in some fully regulated states, such as Iowa, have successfully worked with the dominant utility to create notable corporate RE deployments, sometimes through green tariffs.

CORPORATE OFFSITE RENEWABLE DEPLOYMENT BY STATE (IN MW)



Source: AWEA, RMI, and WRI with Clean Edge analysis. Data current through June 2016.

Beyond market structure and customer choice, other specific policies have a significant impact on corporate buyers' location decisions. Among these are the allowance of offsite third-party PPAs and leases; strong net metering requirements for onsite solar PV generation; policies/regulations that ease the interconnection of DG systems to the grid; and not allowing utilities to impose fixed charges on C&I customers for DG.

Among the states with the lowest rankings in the index (#35 or lower) are several with above-average renewable energy resources: Montana, Nebraska, South Dakota, North Dakota, Idaho, and Wyoming for wind, and Arizona and Florida for solar. Policymakers and regulators in these states would do well to enact more conducive policies to capitalize on the opportunity of corporate and institutional RE procurement.

BUYER BEWARE: CORPORATE BARRIERS AND ROADBLOCKS

In addition to the many state policies and electricity market structures tracked in this index that determine a state's attractiveness for corporate RE deployment, some states have erected (or are considering) provisions that make wind and solar projects cost-prohibitive. While the index indicators do not cover these barriers (many of the policies are still outliers), it's worth discussing how these roadblocks impact corporate RE procurement. Prominent among these are state-specific siting restrictions, targeted taxes, and electricity rate structures.

In Ohio, for example, a 2014 law mandating a minimum 1,125-foot property line setback for wind turbines has effectively scuttled most new wind farm development in the state. Ohio is the only state with such tight restrictions in place, but legislative efforts are underway in other states. North Carolina lawmakers have authored a bill that would ban wind turbines in military flight paths and within five miles of military bases, rendering much of eastern North Carolina's best wind resource areas off limits to development, say wind power advocates. The bill passed the State Senate in June 2016 but stalled in the House.

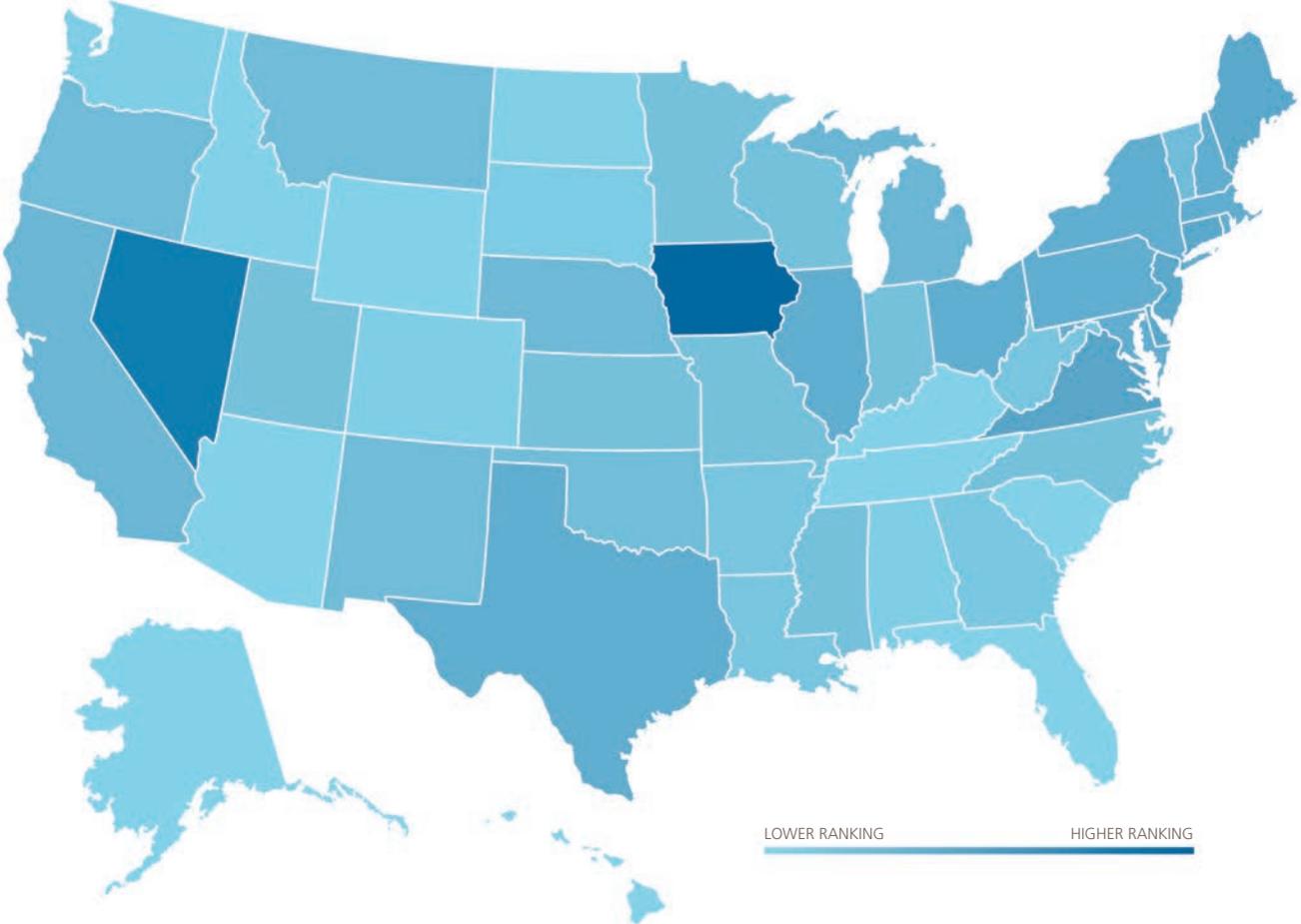
A 2015 law in Oklahoma stipulates a wind turbine minimum setback of 1.5 nautical miles from schools, hospitals, and airports, but an Oklahoma State University study found that only two of the state's existing 2,000+ turbines would have been impacted by this requirement if it had been in place when they were installed. A more onerous bill in Oklahoma that would have imposed a temporary 3-year moratorium on wind farms east of Interstate 35 died in the House. In many states, siting regulations are left to counties or other jurisdictions.

Another potential barrier is state taxes or tax hikes on renewable energy generation. In September 2016, the Wyoming legislature considered but ultimately rejected a tripling of the state's \$1 per megawatt hour (MWh) tax on in-state wind generation to help address a state budget shortfall (caused in part by decreased revenue from falling fossil-fuel production). Wyoming is currently the only state to consider such a tax on wind. The tax increase would have jeopardized the planned 3,000 MW Chokecherry and Sierra Madre wind farm in southern Wyoming.

For solar energy projects, utility rate structures can often act as a barrier to cost-effective corporate RE procurement. This can be a complex issue involving the valuation of distributed solar generation to the grid, time-of-use pricing, net metering reimbursement rates, and more. Corporate buyers seeking distributed solar PV need to be aware of the status of these potential barriers and how it impacts their state-level initiatives. At present, Arizona and Nevada are two of the states most embroiled in battles over how to value solar - battles that have corporations on edge.

Beyond the headline-grabbing net metering controversy in Nevada, many other important details are currently under consideration in these states, including valuation of surplus PV only, rather than the entire output of a system; whether distributed solar customers should be included in a separate rate class; and the time frame for recalculating rates. Arizona utilities are seeking a five-year time frame, for example; solar advocates want a longer 15-year window for long-term planning purposes.

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: UTILITY PURCHASING OPTIONS



LOWER RANKING HIGHER RANKING

RANK	STATE	INDEX SCORE
1	Iowa	100.00
2	Nevada	80.28
3	Virginia	44.59
4	Connecticut	42.86
4	Delaware	42.86
4	Maine	42.86
4	New Jersey	42.86
8	Illinois	38.10
8	Maryland	38.10
8	Massachusetts	38.10
8	New Hampshire	38.10
8	New York	38.10
8	Ohio	38.10
8	Pennsylvania	38.10
8	Rhode Island	38.10
8	Texas	38.10
17	North Carolina	28.58
18	California	28.57
18	Michigan	28.57
20	Nebraska	26.96
21	Montana	23.81
21	New Mexico	23.81
21	Oregon	23.81
21	Vermont	23.81
25	Oklahoma	23.48
26	Indiana	19.05
26	Kansas	19.05
26	Minnesota	19.05
26	Mississippi	19.05
26	Missouri	19.05
26	North Dakota	19.05
26	South Dakota	19.05
26	Utah	19.05
26	Wisconsin	19.05
35	Arkansas	14.29
35	Louisiana	14.29
35	West Virginia	14.29
38	Georgia	12.17
39	Alabama	5.47
40	Colorado	4.76
40	Washington	4.76
42	Alaska	0.00
42	Arizona	0.00
42	Florida	0.00
42	Hawaii	0.00
42	Idaho	0.00
42	Kentucky	0.00
42	South Carolina	0.00
42	Tennessee	0.00
42	Wyoming	0.00

OVERVIEW

The Utility Purchasing Options category measures two key aspects of corporate RE procurement. One is a company's ability to purchase RE through its regulated utility. The category's sole deployment indicator measures the percentage of a state's total generating capacity installed through green tariffs (special tariffs available to large customers that help finance new renewables development) or direct utility purchases (special deals negotiated between a utility and a corporate customer to procure RE through the utility). The policy subcategory consists of four indicators. One credits states for being home to a utility that offers a green tariff or rider. A second rewards states that either mandate that their utilities offer green power programs, where customers generally pay extra for a "block" of a few hundred kWh of renewable energy, or where some utilities offer these programs voluntarily. The green power program indicator carries half the weight of the other indicators in the category.

These first two policy indicators align closely with several of the Corporate Renewable Energy Buyers' Principles. They offer companies some choice in RE products, while increasing cooperation with regulated utilities on long-term agreements. They are not always the cheapest option, however, nor do they guarantee

that additional renewable capacity will be built (which is known as additionality). And they do not have much impact in states where companies can choose their electricity provider. Making these more appealing options for industry is an ongoing need.

Therefore, the category includes two indicators that characterize the basic structure of each state's electric utility market. One awards credit to states that have restructured to allow electric retail choice (generally referred to as "deregulation," though some states only allow large customers to choose their providers). The second rewards states for being part of an ISO or RTO, such as the PJM Interconnection. Having either or both of these measures in place offers companies more options in their quest to procure RE.

RESULTS

Iowa, the #1 state in the overall index, takes the top spot in the Utility Purchasing Options category. The 548 MW of wind power agreements that Google and Facebook have made through the utility MidAmerican Energy are what carry Iowa to the top. Nevada and Virginia, both of which also have deployment that counts in this category, come in second and third. Northeastern states make up much of the rest of the top 20: every state from Maryland and Delaware north is in the top 20 (with the exception of #22 Vermont), though

these states get there by having retail choice and being in organized markets, not through deployment.

Midwestern states Illinois, Ohio (tied for eighth), Michigan (#18), and Nebraska (#20) join Iowa in the top 20. Only two Southern states (tied-for-eighth Texas and #17 North Carolina) join Virginia, while the only Western state besides Nevada is #18 California. Spots #21-30 in the category are occupied primarily by Western and Midwestern states, while the South and interior West dominate the lower parts of the category.

At the indicator level, Iowa is the leader in corporate renewable deployment through utilities (not surprising, since wind is the Hawkeye State's top RE source, accounting for 31% of generation in 2015). The 548 MW of wind power capacity deployed by MidAmerican on behalf of Google and Facebook represents 3.32% of all generating capacity in the state. Only seven other states have seen renewable deployment through green tariffs or direct utility deals. Interestingly, four of them (Virginia, North Carolina, Georgia and Alabama) are in the South, despite the latter two ranking low in the category. Nebraska and Oklahoma are the other Midwestern states that have seen utility/corporate RE deals. Nevada is the only state outside these two regions that has seen deployment, through NV Energy's Green Energy Rider.

Looking at the four policy indicators, just five states (Nevada, New Mexico, North Carolina, Utah, and Virginia) receive credit for having green tariffs or riders in their states, though that number is likely to grow. A dozen states have mandatory green power purchasing option requirements, while 35 more are home to utilities that voluntarily offer such an option. These options are useful for companies in regulated markets. However, since they are essentially renewable energy certificate (REC) purchases at a small premium, they are not as useful as other options. RECs often do not meet companies' needs as they cannot protect against volatile electricity prices, and do not provide the additionality that companies desire.

The electric utility market structure policy indicators bring many states to the top of the category. Thirteen states get credit for both having full retail choice and being part of an ISO/RTO. They all rank fourth through 16th in the category, and most of them are mid-Atlantic and Northeast states that do not have any deployment in the Utility category. (States like New Jersey, Illinois, and Texas have significant deployment counted elsewhere in the index.) However, given RE price declines, the growing demand for clean energy, and the maturation of technologies like offshore wind, that story could change soon in the mid-Atlantic and Northeast regions.

EXAMPLES OF UTILITY-SCALE OFFSITE DEPLOYMENT CONTRACTS

TYPE OF CONTRACT	PARTIES INVOLVED	HOW IT WORKS	EXAMPLE	DESCRIPTION
DIRECT UTILITY PURCHASING	Corporate, Utility	A local utility signs a PPA on behalf of a corporate buyer.	 <p>Procter & Gamble purchases biomass power from Constellation in Georgia</p>	In February 2015, Procter & Gamble contracted with Constellation to build a 50 MW biomass cogeneration plant near P&G's facility in Georgia. P&G will receive steam from the plant, while Georgia Power purchases electricity from it.
GREEN TARIFF PROCUREMENT	Corporate, Utility, Developer (not required)	A corporate buyer utilizes a special utility tariff to provide funding for a new renewable facility located within the utility's service territory.	 <p>Apple receives power from solar farms in Nevada</p>	In 2013 and 2015, Apple reached agreements to pay a premium through NV Energy's Green Energy Rider to purchase 100% renewable energy from approximately 70 MW worth of solar panels in Nevada.
OFFSITE POWER PURCHASE AGREEMENT (PPA)	Corporate, Developer	A corporate buyer agrees to purchase the electricity produced by a renewable facility over a span of years, usually 10-20 years. This provides funding to construct the facility.	 <p>Google purchases 225 MW of wind power in Texas</p>	In January 2016, Google reached an agreement with Invenergy to purchase the generation from the Bethel Wind Energy Facility, southwest of Amarillo, Texas.
DIRECT INVESTMENT	Corporate, Developer	A corporate buyer directly invests in and owns an offsite facility.	 <p>IKEA wind farms in Illinois and Texas</p>	IKEA worked with Apex Clean Energy to fund 263 MW of wind turbines in Illinois and Texas. The facilities are fully owned by IKEA but were constructed and are managed by Apex.

Source: Clean Edge research.

POLICY DISCUSSION

The lesson to be learned from these results is that the leading states are getting creative. The top-ranking states either already allow retail choice, or are carving out some space for retail choice for large customers. Whether it's through green tariffs or the approval of direct agreements with utilities, flexibility is creeping into the relationship between companies and utilities. This is an important development that corporations, utilities, and regulators should continue to encourage. And the benefits don't just accrue to the parties to each agreement: In a statement announcing its 2013 green tariff deal with Apple, NV Energy hailed the agreement for providing additional renewables to the grid at no cost to the utility's other ratepayers.

At the same time, it is important to keep in mind that this development is still relatively new. The first of the green tariffs and riders were only approved in 2013, and the first of the direct utility purchases (between Google and Oklahoma's Grand River Dam Authority) was struck in 2012. So there are kinks that will need to be worked out, and deployment numbers through these two methods are still very modest. "Learning through doing" will help build upon these early successes.

Finally, there are two important things to note about the deployment figures in this category. One is that

GREEN TARIFFS COVERED IN INDEX

STATE	UTILITY	STRUCTURE	YEAR APPROVED	DEPLOYMENT (MW)
 NEVADA	NV Energy	Rider	2013	249
 NEW MEXICO	Public Service Company of New Mexico	Rider	2016	0
 NORTH CAROLINA	Duke Energy	Rider	2013	131
 UTAH	Rocky Mountain Power	Tariff	2015	0
 VIRGINIA	Dominion Power	Rider	2013	20

Source: WRI, "Emerging Green Tariffs in U.S. Regulated Electricity Markets, February 2016", with Clean Edge research. Note: Since data collection ended, a green tariff has been approved in Washington, with tariffs pending before public utility commissions in Colorado and Minnesota. In September 2016, Facebook announced it would build a new data center in New Mexico using PNM's green tariff.

green tariffs and direct utility deals exist for utilities in regulated states, where other non-utility options (particularly for utility-scale RE installations) are largely closed off. The second point is that utilities and large customers are working to set fair and equitable prices, as current programs often come with a price premium. Green tariffs, for instance, often show up

as "riders" sitting on top of a company's normal rate. This is in contrast to procurement through third parties (in states where it is legal), where deployment can result in savings to the customer. (See the sidebar on page 19 and the graphic above for additional details on these distinctions.)

COMPARING AND CONTRASTING GREEN TARIFFS AND DIRECT UTILITY PURCHASES

This index tracks corporate RE deployment through two types of utility programs. Since they can be similar, it is helpful to take a closer look at each of them.

Green tariffs are a relatively new option in the renewable energy world. A green tariff is a special utility commission-approved rate structure that allows a C&I customer to obtain RE (and the associated bundled RECs) directly through its utility. Green tariffs can be structured as tariffs, or as riders placed on top of the customer's existing tariff. Generally, where they are offered, they are broadly available to large C&I customers, utilize a company's existing relationship with its utility, and offer predictability and replicability to customers. But they sometimes come at a price premium, and do not guarantee additionality. (See the table on page 18 for some details on enacted green tariffs.)

As of September 2016, only five states (New Mexico, Nevada, North Carolina, Utah, and Virginia) had approved green tariffs, with just Nevada and North Carolina having seen deployment through them. (In September, Facebook announced that New Mexico, by way of Public Service Company of New Mexico's (PNM) newly-approved green tariff, had been chosen for the site of its next data center.) As of this report's release date, all the offtakers for green tariff deals

have been large technology companies: Google, Apple, and Cisco were among the earliest customers for Duke Energy Carolinas' tariff; both Apple and Switch have used NV Energy's tariff to construct solar farms for their Nevada data centers (though the latter has since sued to leave NV Energy's service territory completely, as casino operators such as MGM Resorts and Wynn Resorts have already done). Watch for new green tariffs under consideration in states such as Colorado, Minnesota, and Washington.

Direct utility purchases are essentially PPAs negotiated directly between a customer and a utility. Though there is no blueprint for realizing these agreements, they have the advantage of replicability from contract to contract. This index counts six states where such deals have been completed: Alabama, Georgia, Iowa, Nebraska, Oklahoma, and Virginia. Interestingly, in two of those instances, the power provider was not an investor-owned utility: Nebraska Public Power District (contract with Becton Dickinson) is the largest public utility in the state, while the Grand River Dam Authority in Oklahoma (contract with Google) is a non-profit state agency that sells primarily to rural energy cooperatives and municipalities.

Direct utility purchases can be a bit complicated to implement. Walmart's deal with Alabama Power, for instance, is essentially a three-way trade, with the utility contracting with a subsidiary of solar developer Origis Energy to construct a new 72 MW solar farm (creating 125 construction jobs in the process), and then contracting to sell most of the power to Walmart. A similar agreement occurred in Georgia, where Procter & Gamble contracted with Constellation Energy to construct a 50 MW cogeneration biomass plant, then use the steam at its nearby paper factory while Georgia Power purchases the electricity.

While both green tariffs and direct utility purchases are designed for states without retail choice, they do represent some creative ways in which utilities are working within the existing regulatory framework to offer RE options. Both green tariffs and direct utility purchases are new creations and have some kinks to work out. They need to be consistently cost-competitive with non-utility renewable PPAs in other parts of the country, but also responsive to their customers' needs in order to harness corporate RE buying power. If those things happen, they could lead to expanded RE procurement opportunities for companies with operations in regulated states.



CASE STUDY: IN ILLINOIS, WIND POWERS CORPORATE DEALS

For a state with a considerable amount of nuclear and coal-fired power, in a region with few bordering renewable energy leaders, Illinois has emerged as one of the strongest states for corporate clean energy deployment and policies.

Ranking second in the overall index behind Iowa, Illinois easily outdistances its other Midwestern neighbors. Indiana is the next best state in near proximity at #28, followed by #29 Michigan, #32 Missouri, and #40 Wisconsin. (In the entire Midwest region, eighth-ranked Ohio is the third-best performer.) Illinois is the #1 state in the Onsite/Direct Deployment category and #7 in Third-Party Purchasing; even in its weakest category, Utility Purchasing Options, Illinois is among the national leaders in a tie for eighth.

Illinois ranks sixth in the nation in wind power generation with more than 10.7 GWh in 2015, according to EIA. In a July 2016 report, Illinois State University's Center for Renewable Energy found that the 25 largest wind farms in the state will generate a total economic benefit of more than \$6 billion during the

construction and 25-year operation of the projects. They have created more than 20,000 construction jobs and support more than 1,000 permanent jobs, the report said. Overall, more than 3,500 people work in the wind industry in Illinois, according to the 2015 Clean Jobs Midwest report from Clean Energy Trust, a Chicago-based clean tech accelerator.

On the corporate deployment side, two major companies, Microsoft and IKEA, have tapped that wind power resource with procurement deals totaling nearly 275 MW, both signed in 2014. It speaks well of Illinois' policy and regulatory environment that each of these deals used a very different procurement mechanism.

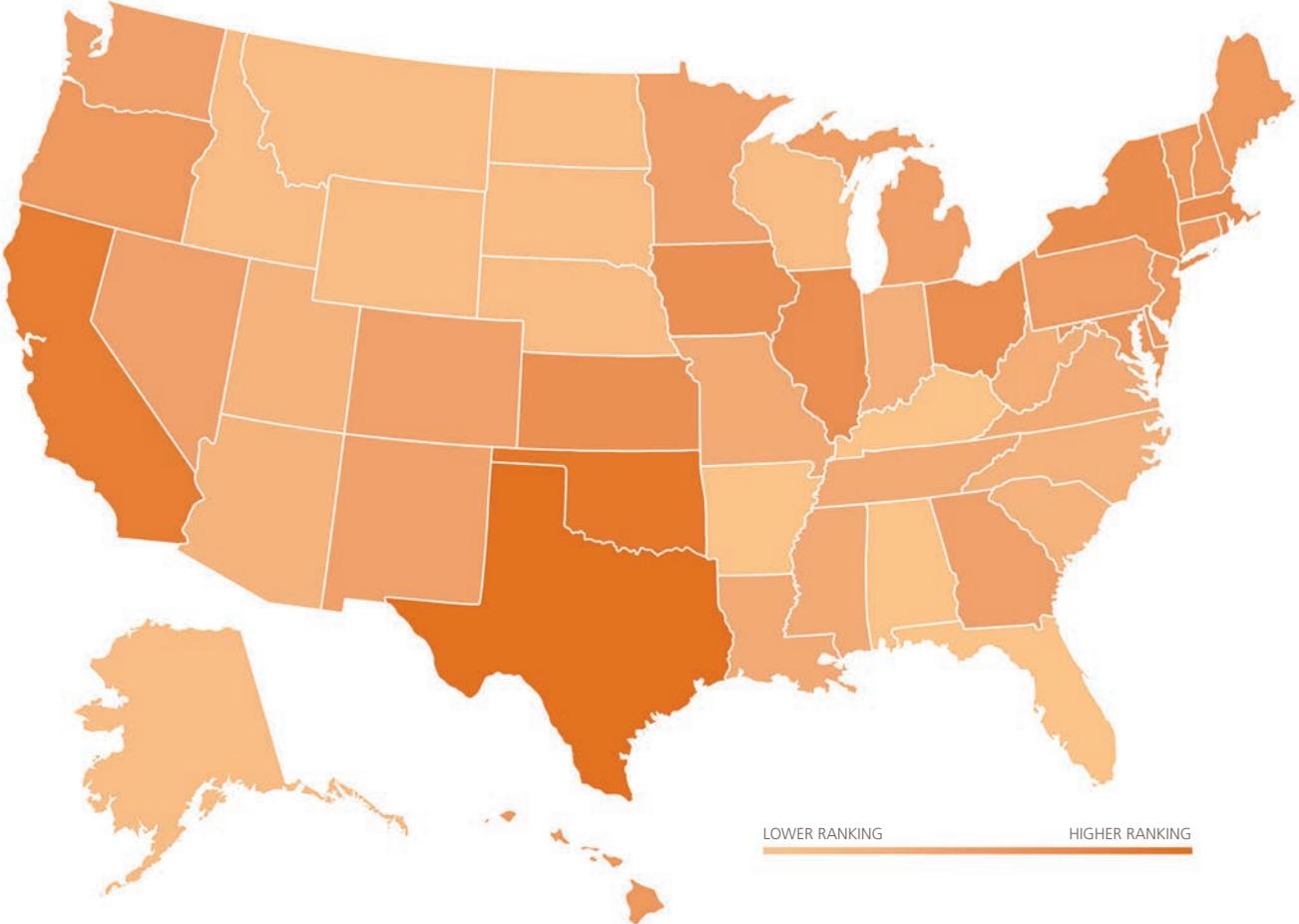
Illinois is one of only three states (along with Texas and North Carolina) with a direct corporate purchase of an offsite renewable generation project to date. That is IKEA's 2014 acquisition of the 98 MW Hoopston Wind project from Virginia-based developer Apex Clean Energy in downstate Vermilion County. The deal helped propel Illinois to the top score in the Onsite/Direct Deployment category, along with strong policy scores for interconnection, net metering, and not approving

utility fixed charges for customer-sited DG systems.

Microsoft's deal is even larger, a 2014 agreement to procure the entire output of EDF Renewable Energy's 175 MW Pilot Hill Wind Project in Kankakee and Iroquois Counties, 60 miles southwest of Chicago. This deal, a traditional third-party PPA, was Microsoft's largest renewable energy purchase at the time and will power its Chicago data center. Microsoft retires the RECs from the project to encourage other companies to develop additional RE projects.

The Microsoft PPA represents nearly 0.4% of Illinois' total statewide electricity capacity, placing the state eighth in the U.S. in percentage of capacity from offsite wind and solar PPA procurement deals. (Illinois has little corporate onsite solar, most of it on two IKEA stores and a Macy's distribution center.) Illinois scores well on policies that encourage third-party procurement, receiving full credit in the index for C&I retail choice, third-party onsite PPAs, and third-party leases (as well as community choice aggregation). Other corporate buyers may follow Microsoft's and IKEA's lead in coming years.

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: THIRD-PARTY PURCHASING OPTIONS



RANK	STATE	INDEX SCORE
1	Texas	100.00
2	Oklahoma	91.57
3	California	85.64
4	New York	70.10
5	Massachusetts	68.68
5	Rhode Island	68.68
7	Illinois	68.28
8	Ohio	67.26
9	Kansas	65.84
10	Iowa	65.46
11	Connecticut	57.23
11	Delaware	57.23
11	Hawaii	57.23
11	Maine	57.23
11	Maryland	57.23
11	New Hampshire	57.23
11	New Jersey	57.23
11	Oregon	57.23
11	Vermont	57.23
20	Pennsylvania	50.68
21	Michigan	46.86
22	Colorado	45.78
22	Georgia	45.78
22	Minnesota	45.78
22	Nevada	45.78
22	New Mexico	45.78
22	Washington	45.78
28	Louisiana	34.34
28	Mississippi	34.34
28	Missouri	34.34
28	Tennessee	34.34
32	Virginia	31.48
33	West Virginia	30.40
34	Indiana	28.11
35	North Carolina	26.00
36	Arizona	22.89
36	South Carolina	22.89
36	Utah	22.89
39	Alaska	11.45
39	Idaho	11.45
39	Montana	11.45
39	Nebraska	11.45
39	North Dakota	11.45
39	South Dakota	11.45
39	Wisconsin	11.45
39	Wyoming	11.45
47	Alabama	0.00
47	Arkansas	0.00
47	Florida	0.00
47	Kentucky	0.00

OVERVIEW

The five indicators in the Third-Party Purchasing category are influential ones for large purchasers. Access to renewable energy and choice in the market is a key factor for companies as they consider states in their site selection process. Many end up choosing the state that can offer them the most RE.

The category's quantitative deployment indicator measures the amount of wind and solar power that corporations have procured through large offsite PPAs, expressed as a percentage of total in-state installed capacity. (It is important to note that third-party offsite PPAs are generally only available in states with organized electric markets.)

The first two policy measures reward states for allowing onsite third-party PPAs and leases. The former allows a retail customer to purchase electricity from the developer/owner of a DG system on the customer's premises, while the latter allows a retail customer to lease a non-utility-owned DG system located on its premises. States only get credit for these indicators so long as they also allow participants to engage in net metering or a similar program.

Additionally, there are two indicators that reward states for allowing customers to pool their resources.

One credits states for requiring utilities to offer community renewables programs, where customers in different locations subscribe to the output of an offsite renewable facility, typically a solar farm (note that not all community renewable programs are offered through utilities). The other credits states which offer CCA, which allows local governments to form a purchasing authority to buy cheaper and/or cleaner electricity than their utility offers. These two indicators are given half the weight of the others in the category because, to date, they have been less important to large companies than third-party ownership.

RESULTS

The wind-swept middle of the country rises to the top of the Third-Party Purchasing rankings. Texas takes the top spot, with 1.91% of its massive total state capacity coming from corporate-funded offsite renewable PPAs. All of these PPAs are for wind farms, with electrons purchased by diverse companies like Google, Dow Chemical, Mars, and Walmart. Oklahoma comes in second; the Sooner State is an interesting contrast in that it gets no credit for the policy indicators, but its 3.22% of state capacity from offsite renewable PPAs is top in the nation. Kansas and Iowa are other top-20 Midwestern states, coming in ninth and 10th, respectively.

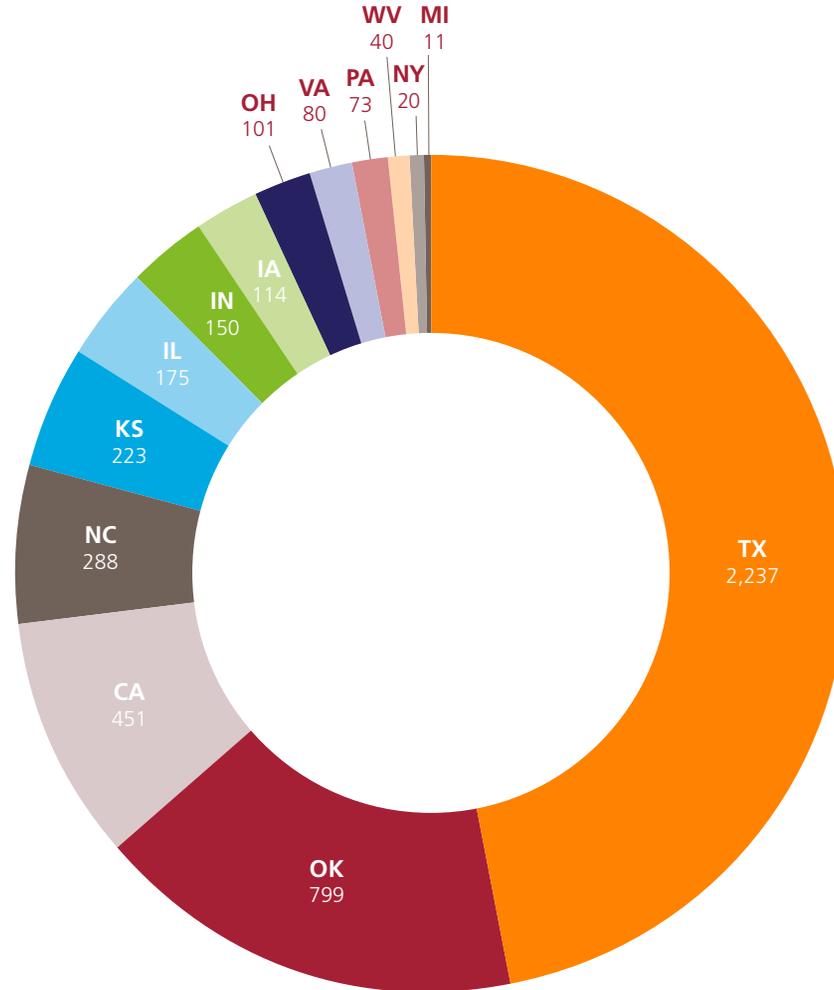
California represents the West Coast at #3. It has both a modest amount of offsite third-party PPA deployment and an excellent policy landscape. The only other Western states in the top 20 are Oregon and Hawaii, coming in towards the bottom of the group. The top 20 also includes the entire mid-Atlantic and Northeast, from Maryland and Delaware (both tied for 11th) up through New England, though only #4 New York and #20 Pennsylvania have any deployment in this category. The other states rely exclusively on policy to boost them. Texas is the only Southern state in the top 20 (four Southern states – Alabama, Arkansas, Florida, and Kentucky – get no credit at all in the category), while many upper Great Plains and interior West states occupy the bottom of the rankings.

On a percentage basis, Oklahoma is the top state in third-party offsite renewable PPAs, at 3.22%. It has nearly 800 MW of PPA deals; Google alone accounts for more than 500 MW of that total. Texas comes in second at 1.91%, though it has far and away the most total third-party offsite corporate PPA deployment in the U.S. with more than 2,200 MW. Fourteen states register deployment through this indicator, with most of it being wind power: California, North Carolina, and Virginia are the only states with offsite procurement from solar farms counted in their mix.

Among the policy indicators, 23 states allow third-party PPAs for onsite C&I DG systems; an additional 15 states that have not absolutely clarified the legality of PPAs, according to the Database of State Incentives on Renewables & Efficiency (DSIRE), are given half credit (see the map on page 24 for details). On the other hand, 35 states allow third-party leases. In all, 23 states get full credit for both third-party PPAs and third-party leases, and they are all in the top 25 in the category (#2 Oklahoma and #9 Kansas are the exceptions).

Requiring utilities to offer community renewables is beginning to catch on across the country, with 14 states getting credit for it in the index. They all fall within the top 19 in the category, though since it is only a half-weight indicator, several states with no community renewables requirement but a lot of offsite PPA deployment rise above the states with a community renewables policy but no deployment. (Colorado, which has been a hotspot for community solar activity, does not get credit here only because it does not allow businesses to keep the RECs they accrue from community solar programs.) CCA, on the other hand, has not spread as much, as only seven states allow it. That includes six of the top eight in the category (plus #11 New Jersey), and seven of the top nine overall.

CORPORATE OFFSITE THIRD-PARTY WIND & SOLAR PPA DEPLOYMENT (MW) BY STATE



Select Public Companies with Notable PPA Deployment:



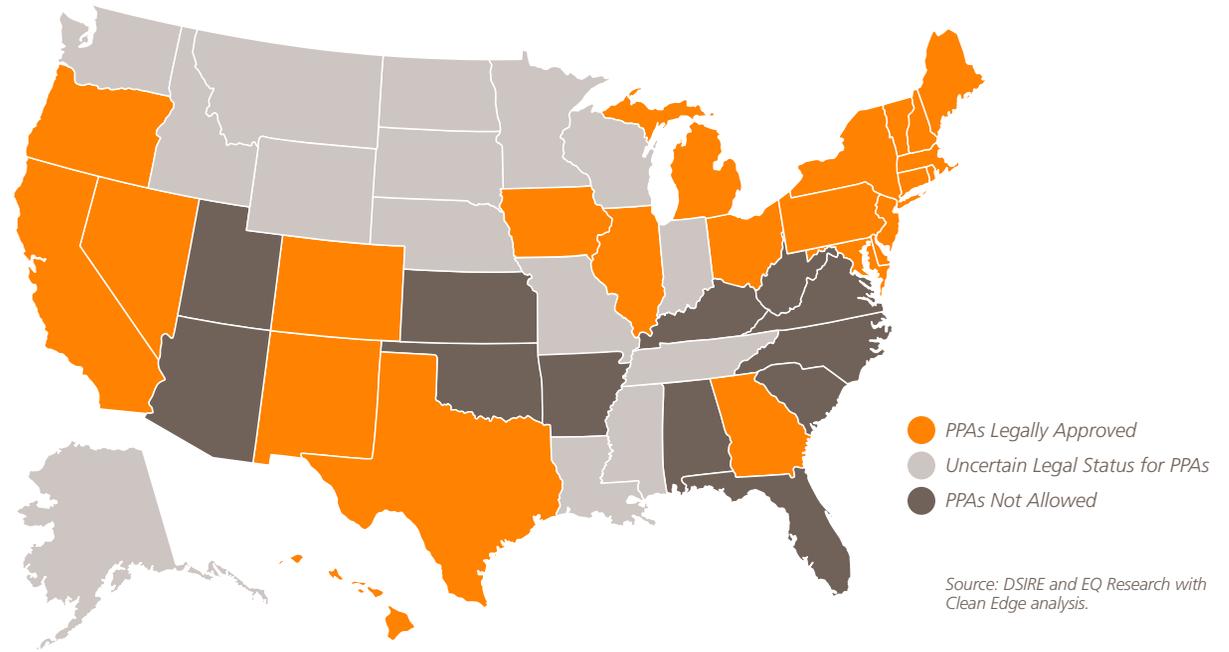
Source: AWEA and RMI. Note: The data in this chart details total deployment, whereas the index utilizes a leveled percent of total installed capacity metric. Data current through June 2016.

POLICY DISCUSSION

As these results show, choice and competition exist across the country, but the extent to which they do in any given state varies immensely. One important difference among states lies in the treatment of third-party PPAs, for both onsite DG and offsite utility-scale installations. Fewer than half the states have clearly stated that third-party PPAs for distributed generation are allowed. Many of the states where DG PPAs are either illegal or uncertain are in the sunny Western and Southern states, such as Utah, North Carolina, or Florida. States would do well to make onsite third-party PPAs 100% legal if they are interested in capturing the economic development benefits that third-party DG ownership could bring.

On the other hand, 18 states that are within organized electricity markets, where offsite third-party PPAs should be fair game, have no such deployment. This includes several windy states like the Dakotas, Nebraska, Missouri, and Minnesota. Those are states that seem ripe for corporate third-party offsite PPA installations. States should examine whether there are barriers not covered in this index that may be preventing such deployment, and lower those barriers where they exist.

ALLOWANCE OF THIRD-PARTY PPAS FOR DISTRIBUTED GENERATION



The choices for corporate customers in states that aren't in an organized market are somewhat limited in terms of third-party procurement. Encouraging states to adopt community solar or CCA (and incentivizing effective corporate participation) is one route. Working with utilities on the types of deals discussed in the

Utility Purchasing category is another. But if companies are interested in maximizing their choices, enabling PPAs (both onsite and offsite) is likely the best option.

CORPORATE PPAS: EFFECTIVE, BUT SOMETIMES COMPLEX

The use of PPAs by corporate buyers seeking renewable energy has soared in recent years. In 2015, for the first time, corporations in the U.S. procured more wind power through PPAs than utilities did. The 2015 total of 3.24 gigawatts of all corporate PPAs for renewables (according to the Rocky Mountain Institute's Business Renewables Center) is equivalent to about six average U.S. coal-fired power plants. Multiple large purchase agreements from tech firms Google, Amazon, and Equinix led the way. Among retailers, Walmart has three large-scale off-site PPAs to date totaling nearly 250 MW. Corporate PPAs have doubled every year since 2012.

In contrast to growing corporate demand, utilities' appetite for large renewable PPAs is slowing in some states as those utilities meet or exceed their RPS requirements, are experiencing stagnant load growth, and/or facing system and infrastructure constraints. So project developers are starting to target corporate buyers as their next growth opportunity. And corporate PPAs give renewables developers another advantage: competing with the retail electricity rates being paid by corporate customers, rather than the lower wholesale prices utilities enjoy for their bulk energy purchases.

Onsite PPAs (mainly solar) are the intended path of 67% of companies planning RE procurement in the next 18 months, according to a PWC survey of corporate RE buyers in June 2016. More than half (58%) plan to purchase traditional offsite PPAs, and 30% plan to pursue offsite virtual PPAs (explained below). In one of the highest-profile onsite PPA deals of 2015, developer Greenskies Renewable Energy will install 100 MW of solar PV at 180 Target retail and distribution center locations in a dozen states.

But all offsite corporate PPAs are not created equal, and understanding the nuances among them is critical as the use of this important tool for corporate clean energy procurement continues to grow. The most important distinction is between physical and financial PPAs. In a traditional or direct PPA, the corporate buyer physically procures the electrons from a wind farm or other renewable generating source, as well as the RECs from the project, at an agreed-upon price. These arrangements are actually quite rare because they are difficult to fully realize. The purchaser, in addition to agreeing on the price, amount of electricity, and other details of the PPA itself, needs to figure out how to transmit the electrons from the RE plant to their facility.

For financial PPAs, businesses have two options, commonly referred to as "virtual" and "synthetic" PPAs. With "virtual" PPAs, the power itself does not go to the buyer; the developer sells it into the local wholesale power market. It is essentially a price hedge against rate volatility. The developer pays the buyer if it can sell the power into the market at a higher rate than the contract price, but if the market price falls below that, the buyer must make up the difference. "Synthetic" PPAs are very similar, except that the renewable generation plant and the purchaser's facilities are located in different ISOs. The manufacturer 3M, whose facilities are mostly located in Minnesota (which participates in the MISO market), recently agreed to a synthetic PPA for 120 MW of wind power located in Texas, which is dominated by ERCOT.

The key decision for companies, then, is whether they want to sign a physical or a financial PPA. Virtual or synthetic PPAs can be a game-changer, as tech firms such as Amazon and Yahoo have found, but they are complex arrangements typically involving a company's legal, treasury, accounting, and finance departments. Many questions need to be asked and answered about the specific language in any virtual or synthetic PPA. Much of the decision, though, rests on market factors, particularly whether a state is in an organized market.



CASE STUDY: COLORADO'S PROPOSED GREEN TARIFF FUELS MILE-HIGH ASPIRATIONS

Colorado, a partially regulated electricity state, joins California and Texas as the only states ranked in the top 10 in the U.S. in both wind and solar power generation, according to EIA data. Its corporate energy procurement performance is middle-of-the-pack at this point, but Colorado shows that even in a regulated state, the right mix of enabling policies can drive procurement, and Colorado is considering more of them.

The Rocky Mountain State places 22nd overall in this index. Its best category is Onsite/Direct Deployment, where it places 11th as well as 11th in the onsite solar procurement indicator in that category, with 10.2 MW statewide. Nearly all of Colorado's corporate solar installations are in the retail sector, according to the Solar Energy Industries Association (SEIA), with Macy's, Safeway, Walgreens, and Walmart locations in the greater Denver area dominating. The state is tied for 22nd with five other states (Georgia, Minnesota, Nevada, New Mexico, and Washington) in the Third-Party Purchasing category. In Utility Purchasing

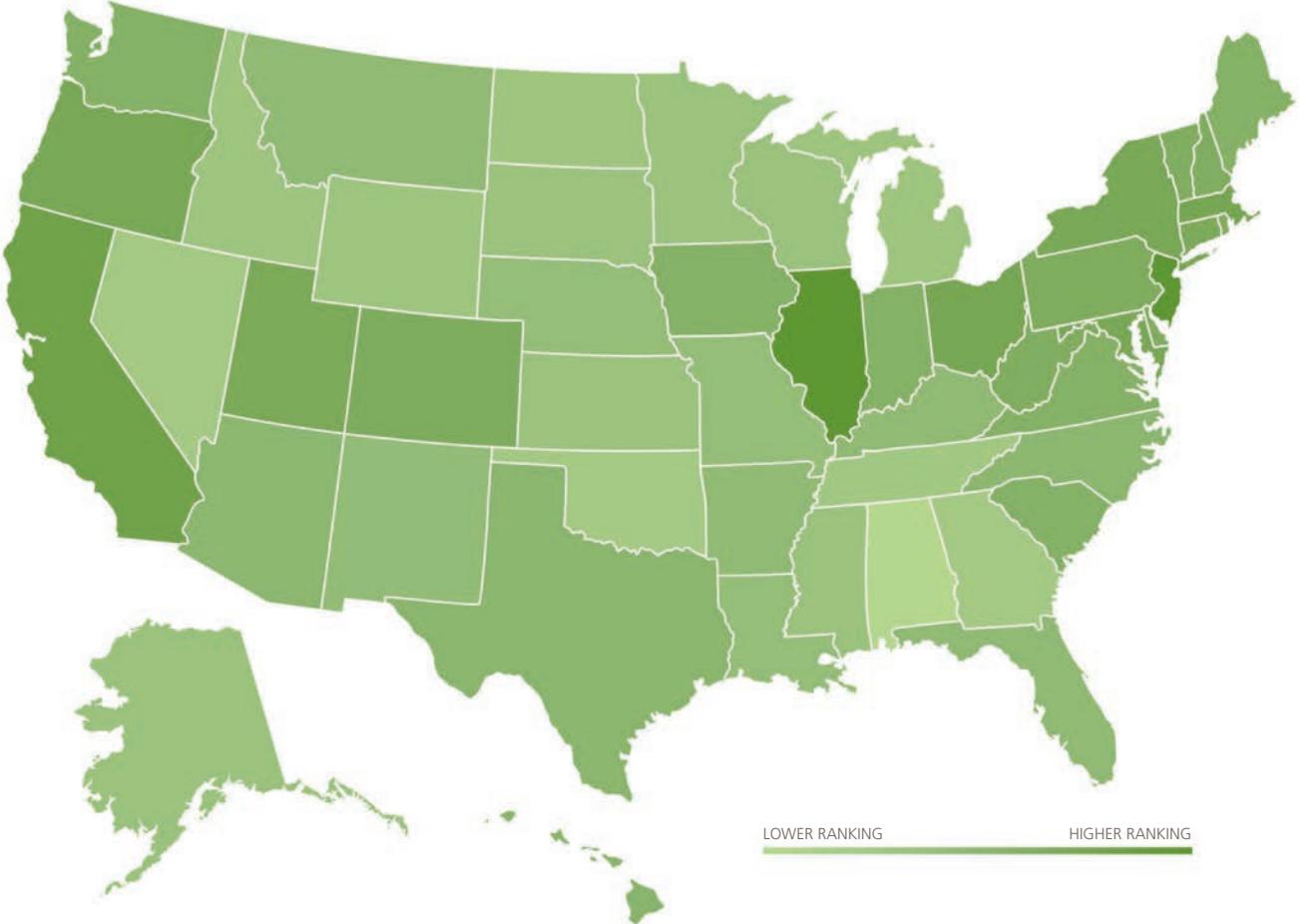
Options, lacking a green tariff, C&I retail choice, and ISO/RTO participation, Colorado ranks just 40th (tied with Washington).

Colorado has no significant corporate offsite procurement deals to date, but that could change soon. The Renewable Energy Buyers' Alliance has worked with Xcel Energy, the state's dominant utility, on a proposed green tariff option that Xcel wants to provide called Solar*Connect. Seeking approval by state regulators by the end of this year, Solar*Connect (to be renamed Renewable*Connect) would offer corporate buyers a fixed price contract for 100% solar power on a month-to-month basis, or for five or 10 years. The longer-term contracts would be at or below projected regular market rates. (The Buyers' Alliance also worked with Xcel on a similar rate plan in Minnesota, with 70% wind and 30% solar power.)

Adding Xcel's green tariff option could be a big boost to corporate procurement in Colorado's clean energy

policy landscape, which is generally favorable, particularly for a regulated state. In addition to mandating a utility green power purchasing option, Colorado allows third-party offsite PPAs and third-party leases; has strong interconnection and net metering policies; and has not approved any DG fixed charges. Although Colorado is a leading state for community solar, it does not receive credit for community renewables in this index because the RECs from such projects convey to the utility for RPS compliance – thus removing a key incentive for businesses to participate in community renewables.

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: ONSITE/DIRECT DEPLOYMENT OPTIONS



RANK	STATE	INDEX SCORE
1	Illinois	100.00
2	New Jersey	99.86
3	California	81.50
4	Massachusetts	75.15
5	Ohio	73.61
6	Maryland	72.79
7	New York	72.20
8	Oregon	71.89
9	Utah	70.86
10	Connecticut	69.40
11	Colorado	66.49
12	Pennsylvania	65.80
13	Rhode Island	65.06
14	Delaware	64.72
15	New Hampshire	64.61
15	Vermont	64.61
15	West Virginia	64.61
18	South Carolina	59.14
19	Virginia	58.89
20	Maine	58.77
21	Indiana	58.74
22	Iowa	58.74
22	Washington	58.74
24	Hawaii	53.80
25	Texas	52.41
26	Arizona	50.10
27	North Carolina	49.86
28	Florida	47.33
29	Kentucky	47.12
30	Arkansas	46.99
31	Montana	46.99
32	New Mexico	42.59
33	Missouri	41.30
34	Louisiana	41.16
35	Nebraska	41.12
36	Minnesota	35.44
37	Kansas	35.39
38	Wisconsin	35.34
39	Mississippi	35.28
40	Alaska	35.24
40	South Dakota	35.24
42	Michigan	29.75
43	Idaho	29.37
43	North Dakota	29.37
43	Wyoming	29.37
46	Tennessee	24.88
47	Nevada	23.91
48	Georgia	23.77
49	Oklahoma	23.49
50	Alabama	0.00

OVERVIEW

A growing number of corporate customers are deploying renewables, usually solar PV, on facility rooftops or on corporate campuses, to meet their increasingly aggressive renewable energy targets. The Onsite/Direct Deployment category measures this important trend, along with the most significant state policies and regulations that help (or hinder) such deployment. Where feasible, onsite solar arrays provide clear RE additionality as well as visibility of a company's RE commitments for employees, the media, and the public.

Of the three categories in the index, Onsite/Direct Deployment has the most overlap with the overall rankings. Sixteen of the overall top 20 states are also in the top 20 in Onsite/Direct Deployment, led by the category's top three states of Illinois, New Jersey, and California, which rank second through fourth overall. Seven of the category's top 10 states are on the East or West coasts; the regional outliers are #1 Illinois, #5 Ohio and #9 Utah. Both of the latter states receive the highest possible grades for the category's three policy indicators (net metering, interconnection, and no DG fixed charges); Ohio also has just over 30 MW of onsite solar deployment, accounting for 0.11% of the state's overall generating capacity, placing the state in a tie with Arizona for ninth in that indicator. The state's largest corporate site is a 9.8

MW array at Campbell Soup's largest U.S. manufacturing plant in Napoleon; retailers with onsite solar in Ohio include IKEA (which has installed solar at 44 of its 49 U.S. locations), Staples, and Walmart.

RESULTS

The Northeast, with eight states, dominates the category's top 20 states. The West and Mid-Atlantic regions have four states each and the Midwest, led by category leader Illinois, and the South have two each.

All of the top states in this category score well on the three policy indicators; what sets Illinois and New Jersey apart in the top two slots is deployment, although it is very different in each state. Illinois is one of just three states with any direct investment procurement deals – large offsite projects within the state that are directly owned by a corporate customer, rather than leased or providing power through a PPA with the developer or utility. Illinois' 98 MW through direct investment at the end of 2015 accounted for 0.22% of its in-state generating capacity, the highest in the nation. The output is all from one deal: IKEA's 2014 purchase of the Hoopston Wind project from developer Apex Clean Energy in downstate Vermilion County. The wind farm's projected yearly generation of up to 380 GWh will offset more than IKEA's annual energy use in the U.S., according to the retailer.

Interestingly, the two other states with direct investment procurement deals do not rank highly in this category, due to low policy scores. Texas (165 MW, 0.14% of state capacity), mirroring its performance in the Third-Party Purchasing category with strong PPA deployment but weak policy scores, is 29th, and North Carolina (20 MW, 0.06%) is 34th. As in Illinois, the total in Texas is all from an IKEA procurement from Apex Clean Energy in 2014, the Cameron Wind farm near Brownsville in the Rio Grande Valley. In North Carolina, Apple built three solar projects totaling 57 MW developed by SunPower, and a 10 MW biogas fuel cell project to run their data center in Maiden.

Solar rooftop and stand-alone arrays on corporate sites have grown dramatically in recent years, and a much larger number of states than the three with direct investment procurement deals, 25, receive measurable scores for onsite solar procurement in this index. A dozen more states have some onsite solar deployment, but not enough (usually less than one MW) to register as a percentage of total state capacity. New Jersey leads in this indicator by a wide margin, with corporate onsite solar accounting for 1.21% (225.6 MW) of the state's total generation capacity, well ahead of California's 0.38% (285 MW). Dozens of companies have deployed solar on distribution centers, retail

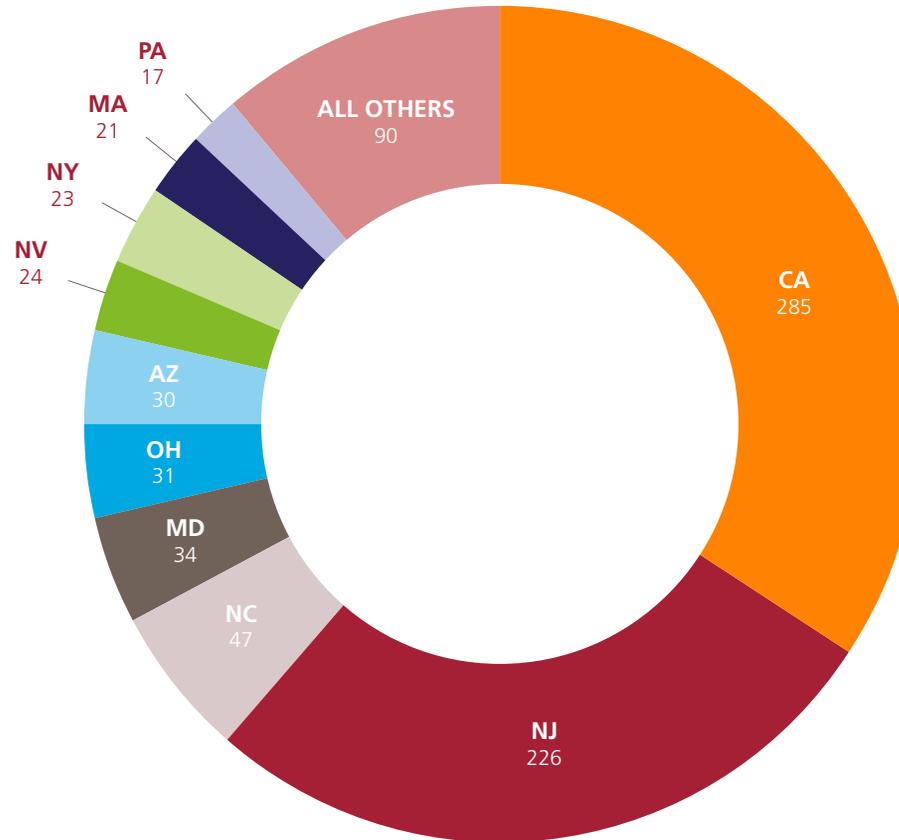
stores, corporate campuses, and manufacturing plants in New Jersey, with pioneers like FedEx, McGraw-Hill, Staples, Target, and Toys R Us.

Five of the top eight states in this indicator are on the East Coast (New Jersey, Maryland, Connecticut, Massachusetts, and North Carolina), with much lower solar resources than the Western states, showing the influence of favorable policies. Three states in the West – California, Hawaii, and Nevada – round out the top eight.

POLICY DISCUSSION

The first of the three policy indicators is a “negative” one; states receive credit if major utilities in their jurisdiction do not impose fixed charges on corporate owners of onsite DG systems, and no credit if they allow such charges. Although this is the best way to benchmark states in this important policy area for indexing purposes, we realize that not all fixed charges are created equal. Rate design is a highly complex issue, and fixed charges come in many forms and sizes. High fixed charges that are not DG-specific, for example, can have the same negative impact as DG-specific charges. A total of 44 states receive credit for not having DG-specific charges, including the category’s top 26 states. Of the six that do not, several

CORPORATE ONSITE SOLAR DEPLOYMENT (MW) BY STATE



Select Public Companies with Notable Onsite Solar Deployment:



Source: SEIA, Solar Means Business 2015. Note: The data in this chart details total deployment, whereas the index utilizes a levelized percent of total installed capacity metric. Data current through November 2015.

(such as New Mexico and Nevada) are in solar-rich resource areas; these fixed charges have aroused much controversy recently among solar power advocates in those states.

The other two policy indicators give states a grade of 0 to 4 on their statutes or regulations regarding the ease of interconnecting DG systems to the grid, and on requiring utilities to credit onsite DG users for excess generation via net metering. The grades for both indicators are derived from the 2016 Freeing the Grid report, a joint project of the Interstate Renewable Energy Council, the advocacy group Vote Solar, and EQ Research, with the grades updated to be specifically applicable to the C&I sector. (The report assigns grades of A through F, which we have changed to numeric grades for indexing purposes.) For interconnection, 11 states receive the top grade of 4, including seven of the Onsite/Direct Deployment category's top nine, and 16 more get a 3.

For net metering, 19 states capture the top grade of 4, including 16 of the top 17 in the category (as it happens, the exception is category leader Illinois, with a grade of 3). Six states, ranked between third and ninth in the category, receive 4's for both policies (as well as the credit for not approving fixed charges):

STATES THAT HAVE IMPOSED FIXED CHARGES FOR DISTRIBUTED GENERATION

STATE	UTILITY	DESCRIPTION
 ALABAMA	Alabama Power	A capacity reservation charge of \$5.00/kW of generator capacity (secondary service) or \$4.46/kW of generator capacity (primary service) applies to nearly all DG customers. Customers with a DG facility that is less than 25 kW and which amounts to no more than 6% of the customer's 15-minute maximum demand over the prior year are exempt from the charge.
 MICHIGAN	All Utilities	Per the net metering rule, standby rates may be required for customers with generators larger than 150 kW. The two largest utilities' (DTE and Consumers) standby rates feature much higher monthly service charges (e.g., more than \$100/month) than those that could apply on otherwise applicable rates.
 MINNESOTA	All Utilities	Standby service rates may be required by utilities for DG installations larger than 100 kW. Standby rates and methodologies vary by utility and can be offset by a solar capacity credit that recognizes the solar contribution towards meeting peak generation capacity needs.
 NEVADA	NPC, SPPC	DG customers not subject to demand rates (residential and small commercial) are subject to higher fixed charges, which under a phased approach will rise gradually over the next 12 years to cover all fixed customer and distribution service costs. In the future, portions of transmission and generation capacity costs may be included in the fixed charge.
 NEW MEXICO	Southwest Public Service Co. (Xcel)	Standby service rates apply to all residential and small general service DG systems, at different rates by class. For small general service customers, it currently amounts to roughly 1.4 cents/kWh for all DG energy production during a month, capped at the customer's total onsite energy use during that month.
 NORTH CAROLINA	DEC, DEP, Dominion	Standby service rates apply to all residential and small general service DG systems, at different rates by class. For small general service customers, it currently amounts to roughly 1.4 cents/kWh for all DG energy production during a month, capped at the customer's total onsite energy use during that month.

Source: EQ Research.

California, Massachusetts, Ohio, New York, Oregon, and Utah. At the other end of the spectrum, only four states – Tennessee, Georgia, Oklahoma, and Alabama – get zero grades on both interconnection and net

metering. Of those, only Alabama, ranked #50 in both this category and the overall index, has approved DG-specific fixed charges as well.

ENERGY STORAGE: THE MISSING LINK?

Many consider energy storage central to enabling broad renewable energy adoption. Storage enables customers to manage their electricity bills more effectively through a process called “peak shaving.” Peak shaving reduces a customer’s demand charges (the amount charged by utilities for a commercial customer’s period of highest demand, often measured in 15-minute intervals) by using stored energy (particularly stored solar power) to replace grid power with stored power during times of high demand, or when per-kWh electricity costs are high.

Using storage for these purposes isn’t theoretical: a growing number of companies are doing it, particularly retailers. Retail stores can have sizable peak demand, but can still be small enough that batteries can be designed to make a difference in their peak demand. 7-11, for instance, has worked with Green Charge Networks to install batteries at several locations in New York and California. They have successfully reduced store demand charges, while also integrating fast-charging electric vehicle (EV) chargers and surviving Superstorm Sandy in 2012. Other examples of retailers that have installed storage include Safeway, Walgreens, and Walmart.

But even with all its recent hype, energy storage is still in a nascent stage of development. Energy storage chemistries, including much-touted lithium-ion batteries, remain relatively small markets. But as in the renewables sector a decade ago, growth is on the horizon. Greentech Media, in its Energy Storage Monitor 2015 year in review, noted that the 221 MW of new capacity installed that year was 243% higher than it was for 2014.

Falling costs are one reason for storage’s expansion. Deutsche Bank in 2015 predicted that storage costs would come down enough by the end of this decade to promote mass adoption; its model, for instance, showed that the levelized additional costs of adding storage to a solar PV system would drop from \$0.14 down to \$0.02 per kWh within five years. Market developments, such as Tesla’s impending completion of the “Gigafactory” and strategic acquisitions by large players within the sector, could support this cost decline.

Significant policy initiatives are also enabling increases in energy storage deployment:

- **California** in 2013 enacted a storage mandate requiring 1.3 GW of storage capacity by 2020. Storage is eligible to receive funding

through the state’s Self-Generation Incentive Program (SGIP), and is incentivized through the state’s distributed resource planning processes.

- **Oregon** passed a law in 2015 requiring its two major utilities to each procure 5 MWh of storage by 2020.
- **Massachusetts** has until the end of 2016 to decide whether to create the nation’s third energy storage mandate. This comes on top of 2015’s creation of an Energy Storage Initiative to study how storage can help the state’s clean energy industry.
- While **Hawaii** failed to pass storage incentive legislation in 2016, the state’s 100% renewable goal and its ending of traditional net metering (not to mention the nation’s most costly energy) will likely boost its storage market. (Without net metering providing the ability to sell electricity back to the grid, it makes more economic sense to store it onsite.)
- And in **New York**, the Reforming the Energy Vision (REV) initiative and demand management efforts are opening the door for storage. ConEdison, the state’s largest utility by number of customers, offers incentives for storage devices and other demand-reducing technologies.



CASE STUDY: NORTH CAROLINA— A STUDY IN CONTRASTS

North Carolina – ranked 30th overall in the index, behind neighboring Virginia (#20) but ahead of bordering South Carolina (#36) and Georgia (#37) – is a bit of a dichotomy. The Tar Heel State has been a hotbed for renewables, particularly solar power, over the last few years. It ranks third in the U.S. (trailing only California and Arizona) in total installed solar with nearly 2.1 GW as of December 2015, according to SEIA, and a wind market is taking shape as well. That being said, these successes come despite a mixed policy environment, as the state fares poorly among the policy factors tracked in this index (though it has some other favorable clean-energy policies in place that are not tracked here).

The state's biggest strength is the Utility Purchasing Options category. North Carolina places 17th in the category. One thing it has going for it is a green tariff. Duke Energy Carolinas' Green Source Rider is one of only five green tariffs in the country, and through it, Duke has seen more than 130 MW of corporate solar deployment from Google, Cisco, and other compa-

nies. On the other hand, the state does not offer its companies the option to choose their electricity provider, and the small northeastern slice of the state that participates in the PJM market is not large enough to get it credit for the ISO/RTO indicator.

The Third-Party Purchasing category is a definite weakness. North Carolina finds itself 35th in the category, behind nearby states like Georgia and Virginia. North Carolina receives zero credit on all four policy indicators in the category that enable third-party ownership of DG systems and community-scale renewables. Third-party PPAs are illegal in most of North Carolina, for example. On the other hand, the state has an impressive amount of corporate large-scale PPA-funded projects, handily beating out its Southeastern neighbors despite only the PJM portion of the state being open to third-party PPAs. Lockheed Martin and Corning have used PPAs to invest in solar power, while Amazon (through Iberdrola's Avangrid Renewables unit) is constructing a 208 MW wind farm near Elizabeth City; it will be North Carolina's first utility-scale wind farm, and one

of the first (and largest) in the Southeast. These projects put the state fourth in the corporate renewable PPA deployment indicator.

North Carolina is right in the middle in the Direct/Onsite Deployment category, with a #27 rank. It is one of only three states to have renewable deployment through direct corporate ownership of an offsite facility (three solar projects totaling 57 MW and a 10 MW biogas fuel cell project powering Apple's LEED Platinum data center in Maiden), and is third in corporate onsite solar deployment (far behind leaders California and New Jersey), according to SEIA's Solar Means Business report. North Carolina also receives a grade of "A" for its interconnection policy. On the other hand, the state receives a "C" grade for its net metering policy, and Duke Energy Carolinas assesses a standby charge (an additional per-kW or per-kWh rate charged when a DG system experiences an outage, planned or otherwise) of \$1.1556/kW for DG solar arrays of 100 kW or larger.

FIVE-POINT STATE ACTION PLAN

As outlined in this report, there are a number of actions that governors, legislators, regulators, utilities, third-party providers, and corporations themselves can take to support the procurement of renewable energy by large institutional customers.

Perhaps more than anything else in this report, corporate customers are looking to control their own destiny by leveraging a landscape of renewable investment market choice options, especially as many of them work to power their operations with 100% renewable energy. Choice can take many forms, depending on factors such as whether a state is regulated or deregulated, or is part of a regional organized market.

While there is no one-size-fits-all solution, the following actions at the state level would go a long way in supporting the growth of corporate renewables procurement.

1 Remove barriers to corporate deployment of both onsite and offsite renewable installations.

DG-specific fixed charges should be eliminated in states that allow them, in favor of more balanced rate structures. The grid offers services to all energy users, but high fees or long processes for interconnection, high standby charges, and other roadblocks meant to discourage distributed generation must not be allowed. Interconnection and net metering policies should encourage DG market development, and should not present overly burdensome restrictions for DG customers. Laws and regulations should also encourage offsite RE. Siting restrictions, taxes on renewable generation, and other barriers to expanded renewable opportunities should be taken down. In their place should be incentives and rate structures that encourage the integration of more renewables – both distributed and centralized – onto the grid.

2 Support the development of next-generation options to purchase renewable energy through utilities in regulated markets.

Many corporate buyers are exclusively looking for contracts that will help them save on energy costs or at least hedge against long-term price volatility. Utilities and corporates should work together to ensure that existing offerings meet these goals. The green tariffs currently in existence are first-generation products and could be improved as companies and utilities gain more experience from them. They should be authorized beyond the five states where they are currently available, while being flexibly structured to meet the needs of their purchasers. Direct purchasing of utility-scale renewables is also a relatively new development that should be explored further. In states where these existing options do not meet customer needs, the parties should collaborate to create new products that do.

3 Expand energy choice options for C&I customers in regulated markets.

In regulated states, where signing large-scale PPA agreements are not currently feasible, policymakers could explicitly authorize third-party PPAs and leases for distributed generation, enable community solar programs and support corporate participation in them, and/or authorize new green tariffs.

4 Ensure that an adequate market exists for renewable purchasing through both utilities and third-party programs.

Different institutional customers have different needs as they pursue their RE goals. States need to be comprehensive in their approach to providing options for expanded RE. States should not choose between setting up effective utility or third-party markets. Rather, they should strive to do both. Implementing both Action Points #2 and 3 will ensure that a strong market is available regardless of the avenue a customer wishes to go down to procure RE.

5 Ensure that RE in both regulated and deregulated markets can scale up rapidly.

A key action that governors, state legislators, and other policymakers can take is allowing the maximum amount of choice according to state laws, and making these options available as soon as possible. This involves a complex set of decisions, and policymakers will need to tailor their decisions to state laws. However, the main thrust of the effort should be to *provide as much customer choice as possible, as soon as possible*. States should also make renewable energy part of their economic development plans. By encouraging infrastructure construction, and helping companies find cost certainty on their electricity bills, RE development can be a boon to both existing and relocating businesses in any state.

APPENDIX A: METHODOLOGY

The index measures each state on a 100-point scale and is based on calculations made at the indicator, subcategory, and category levels. The index scores each state on a 0-100 scale for each indicator. The best-performing state in each indicator gets a score of 100, the lowest ranked state gets a score of zero, and the index scores other states based upon how closely they measure up to the top state.

The index breaks each category in the index into two subcategories, one for deployment measures and the other consisting of policy indicators. Each category weights the subcategories equally, so that deployment and policy each count for 50% of the category score. Scores for indicators in each subcategory are averaged, after which each state is assigned a category score in the same way that indicator scores get awarded. Finally, the category scores are averaged to give each state an overall index score.

The quantitative deployment indicators (tracking corporate RE installations by type) are all adjusted by dividing the megawatts (MW) of deployed renewable capacity by the state's total installed capacity. The result is expressed as a percentage. This puts states on a level playing field and does not punish less populous states for their size. Some policy indicators are binary yes/no measures, while others grade states on the degree and/or quality of their policies.

Clean Edge collected data for the *Corporate Clean Energy Procurement Index: State Leadership & Rankings* in July and August 2016. Data sources include (see Appendix B for definitions and data sources for each indicator):

- **American Wind Energy Association (AWEA)**
- **Database of State Incentives for Renewables and Efficiency (DSIRE)**

- **EQ Research LLC**
- **Federal Energy Regulatory Commission (FERC)**
- **LEAN Energy US**
- **Rocky Mountain Institute (RMI)**
- **Solar Energy Industries Association (SEIA)**
- **State Policy Opportunity Tracker (SPOT) for Clean Energy**
- **U.S. Energy Information Administration (EIA)**
- **World Resources Institute (WRI)**

APPENDIX B: INDICATOR DEFINITIONS

UTILITY PURCHASE OPTIONS

UTILITY GREEN POWER PROCUREMENT – This indicator captures the share of generating capacity in each state represented by two sources: utility green tariff offerings; and special renewable PPAs signed by utilities on behalf of specific customers. Data used for this indicator comes from the World Resources Institute (WRI), the Rocky Mountain Institute (RMI), and the U.S. Energy Information Administration (EIA). This measure adds up the total megawatts from green tariff deals and utility corporate PPA purchases in each state and divides this number by the state’s total installed capacity as of May 2016.

Size-Adjustment Metric: *Total Installed Generating Capacity in MW*

Indicator Calculation: *(MW of Green Tariff & Utility Corporate Purchase Agreements)/(Total Installed Capacity)*

EXISTENCE OF A GREEN TARIFF – A green tariff is a special rate structure offered by utilities to large customers, allowing for the construction of new renewables on the local electric grid. States with at least one green tariff available receive credit for this indicator. This data comes from the WRI’s February 2016 document “Emerging Green Tariffs in U.S. Regulated Electricity Markets”. NOTE: Actual projects do not have to be present for tracking in this element; the existence of the offering is what is being credited here.

GREEN POWER PURCHASING OPTION – Green power purchasing programs – which support development of clean energy by charging premium rates to cover any above-market costs of clean energy installations – are offered by many, but not all, utilities across the U.S. They allow customers to purchase RECs in incremental “blocks” of kWh, usually for a premium of a few dollars per block of a few hundred kWh. To advance the green power pricing market, some states have made it mandatory for utilities to offer consumers a way to participate in the purchase of green

power. This indicator is weighted so that it counts for only half as much credit as a fully weighted indicator. States that have one or more utilities that offer green power purchasing programs voluntarily receive half credit for this indicator (essentially one-quarter of a full-credit indicator), while states that require utilities to provide such programs receive full credit (half a full-credit indicator). The source for this indicator is the Center for the New Energy Economy (CNEE), in partnership with the Nature Conservancy.

RETAIL CHOICE – Retail choice allows an electric C&I customer to choose an electricity provider other than the customer’s electric distribution company. To receive credit for this indicator, a state must allow at least some C&I customers to choose an electricity provider. States that have capped retail choice at a specific level or that only allow retail choice for customers above a specific size are still counted here as having retail choice (although with reduced credit in some cases). For this measure, states with full retail choice for C&I customers receive full credit. States that have signifi-

cant limitations (e.g., % of sales or kW demand eligibility thresholds) receive partial credit. This indicator closely aligns with deregulation, with fully deregulated states receiving full credit under "retail choice." Data for this indicator comes from EQ Research.

PRESENCE OF AN ISO/RTO – Companies with operations in states that participate in an ISO or RTO have additional RE procurement opportunities available to them. Most notable among these is the ability to sign third-party offsite renewable PPAs. Most ISOs/RTOs serve multiple states, though not all of a state's territory may fall within an ISO/RTO. To receive credit for this indicator, a state must have at least 50% of its customers served by an ISO/RTO. Data for this indicator comes from EIA, FERC, and the ISO/RTO websites, as compiled by EQ Research.

THIRD-PARTY PURCHASING

OFFSITE PPA PROCUREMENT – Businesses can sign PPAs to receive the environmental benefits of renewable projects built by third-party developers. This indicator measures the capacity of all such deals signed in each state. (Not all of the renewable facilities for these agreements have completed construction yet, but all agreements have been signed, and the projects should be completed in the next few years). Data used

for this indicator comes from the American Wind Energy Association (AWEA), RMI, the WRI, and the U.S. EIA. This measure adds up the total megawatts from corporate wind and solar PPA deals in each state and divides this number by the state's total installed capacity as of May 2016.

Size-Adjustment Metric: *Total Installed Generating Capacity in MW*

Indicator Calculation: *(MW of Corporate Wind & Solar PPAs)/(Total Installed Capacity)*

THIRD-PARTY PPAS – This refers to an arrangement where a non-utility owner of a DG system sited on the premises of a retail electric customer sells the electricity generated by the system to the retail electric customer. To receive credit for this indicator, a state's statutes and/or regulations must allow for PPA arrangements without subjecting the third-party owner to significant regulatory barriers, and must allow participants in such arrangements to engage in net metering or a similar program. States in which the legal status of third-party PPAs is unclear receive half credit for this indicator, while states where third-party PPAs are illegal receive no credit. Data for this indicator comes from DSIRE, EQ Research, and Clean Edge.

THIRD-PARTY LEASES – This refers to an arrangement where a non-utility owner of a DG system sited on the premises of a retail electric customer leases the system to the retail electric customer. To receive credit for this indicator, a state's statutes and/or regulations must allow for lease arrangements without subjecting the third-party owner to significant regulatory barriers, and must allow participants in such arrangements to engage in net metering or a similar program. Data for this indicator comes from EQ Research.

COMMUNITY RENEWABLES – This arrangement allows multiple retail electric customers at different locations to subscribe to the electrical output of a DG system located at a different site, and/or to receive net metering credits from a DG system located at a different site. To receive credit for this indicator, a state must have established a policy requiring major electric utilities to allow such billing arrangements. This indicator is weighted so that it counts for only half as much credit as a fully weighted indicator. Data for this indicator comes from EQ Research.

COMMUNITY CHOICE AGGREGATION – Community choice aggregation (CCA) legislation allows local governments to pool the electricity (and sometimes natural gas) demand within their jurisdictions in order

to purchase or develop power for their residents and businesses from an entity other than their local utility. This indicator gives credit to states that have enabled such programs through legislation, according to LEAN Energy US. This indicator is weighted so that it counts for only half as much credit as a fully weighted indicator.

ONSITE/DIRECT DEPLOYMENT

ONSITE SOLAR PROCUREMENT – This represents the share of generating capacity in each state represented by C&I onsite solar projects within each state. Data used for this indicator comes from the Solar Energy Industries Association (SEIA) Solar Means Business 2015 report and the U.S. EIA. This measure adds up the total megawatts from onsite solar projects in each state and divides this number by the state's total installed capacity as of May 2016.

Size-Adjustment Metric: *Total Installed Generating Capacity in MW*

Indicator Calculation: $(MW\ of\ Onsite\ Solar\ Projects) / (Total\ Installed\ Capacity)$

DIRECT INVESTMENT PROCUREMENT – This represents the share of generating capacity in each state represented by large offsite projects within each state that are directly owned (as opposed to leased or for

which a PPA has been signed) by a business. Data used for this indicator comes from RMI, AWEA, and the U.S. EIA. This measure adds up the total megawatts from directly-owned projects in each state and divides this number by the state's total installed capacity as of May 2016.

Size-Adjustment Metric: *Total Installed Generating Capacity in MW*

Indicator Calculation: $(MW\ of\ Directly-Owned\ Projects) / (Total\ Installed\ Capacity)$

DISTRIBUTED GENERATION FIXED CHARGES

– These charges, which include higher monthly customer charges and standby charges, are imposed by a handful of utilities on C&I customers who use an onsite DG system. This indicator reflects which states have authorized one or more major utilities to impose DG-specific surcharges. States that have NOT allowed one or more utilities to institute such a charge get credit for this indicator, whereas those that have allowed one or more utilities to institute such charges get no credit for this factor. Data for this indicator comes from EQ Research.

INTERCONNECTION PROCEDURES – These govern the technical and procedural rules for interconnecting a DG system to the distribution grid. To receive credit

for this indicator, a state must have adopted interconnection procedures that apply to major electric utilities. The level of credit awarded reflects the overall quality of the state's policy, based on numerous policy nuances. Data for this indicator comes from the Freeing the Grid report, produced by IREC and Vote Solar, with data supplied by EQ Research. The grades have been updated to be specifically applicable to the C&I sector. Freeing the Grid issues A through F grades, which have been converted to a 0-4 scale in order to score this index, where A=4, B=3, C=2, D=1, and F=0.

NET METERING – This billing arrangement generally allows a retail electric customer to receive retail credit for the electricity generated by a DG system serving that customer. To receive any credit for this indicator, a state must have an active policy requiring major electric utilities to allow net metering. The level of credit awarded reflects the overall quality of the state's policy, based on numerous policy nuances. Data for this indicator comes from the Freeing the Grid report, produced by IREC and Vote Solar, with data supplied by EQ Research. The grades have been updated to be specifically applicable to the C&I sector. Freeing the Grid issues A through F grades, which have been converted to a 0-4 scale in order to score this index, where A=4, B=3, C=2, D=1, and F=0.

APPENDIX C: ADDITIONAL RESOURCES

Below are some useful resources, including organizations that are helping businesses procure more RE, and publications outlining some of these efforts.

ORGANIZATIONS

American Business Act on Climate Pledge – A White House initiative initiated in 2015 that asks companies to voluntarily support the Paris climate accord and reduce their impact on the climate.

Business for Innovative Climate & Energy Policy (BICEP) – BICEP is an advocacy coalition of businesses committed to working with policy makers to pass meaningful energy and climate legislation that will enable a rapid transition to a low-carbon, 21st century economy that will create new jobs and stimulate economic growth while stabilizing our planet's fragile climate.

Business Renewables Center – The Business Renewables Center (BRC), an RMI initiative, works to streamline and accelerate corporate purchasing of off-site, large-scale wind and solar energy.

Business for Social Responsibility (BSR) Future of Internet Power Initiative – The Future of Internet Power initiative, headed by BSR, brings together technology companies to enable data centers to utilize more renewable energy.

CDP – CDP is a not-for-profit that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts.

Corporate Renewable Energy Buyers' Principles – A group of large energy buyers, spearheaded by nonprofits WRI and WWF, developed the Buyers' Principles to spur progress on renewable energy and actively engages utilities by partnering with the Edison Electric Institute (EEI), the trade association for investor-owned utilities.

Database of State Incentives for Renewables & Efficiency (DSIRE) – DSIRE is the most comprehensive source of information on incentives and policies that support renewable energy and energy efficiency in the United States.

Environmental Protection Agency Green Power Partnership – The Green Power Partnership is a voluntary program that encourages organizations to use green power as a way to reduce the environmental impacts associated with conventional electricity use.

RE100 – RE100 is a global initiative of influential businesses committing to 100% renewable electricity. It is a joint effort of CDP and The Climate Group.

Renewable Energy Buyers Alliance (REBA) – REBA works with a range of stakeholders to identify both barriers and solutions to buying renewable energy.

State Policy Opportunity Tracker (SPOT) – From Center for the New Energy Economy (CNEE), in partnership with The Nature Conservancy (TNC), SPOT synthesizes existing information related to 38 state clean energy policies.

We Mean Business – A coalition of organizations, formed by Ceres, BSR, CDP, and others, working with thousands of the world's most influential businesses and investors to enable the transition to a low-carbon economy.

PUBLICATIONS

Advanced Energy Economy Institute and Meister Consultants Group, ***Opportunities to Increase Corporate Access to Advanced Energy: A National Brief*** – This August 2016 report discusses six specific policy proposals and analyzes each state to determine which ones could expand corporate access to renewable energy the most by implementing each policy.

Clean Edge, ***Getting to 100: A Status Report on Rising Commitments Among Corporations and Governments to Reach 100% Renewables*** – A report that outlines business and government efforts to power all of their operations with renewable energy.

Corporate Eco Forum and World Wildlife Fund, ***Corporate Renewable Energy Procurement: A Snapshot of Key Trends, Strategies and Practices in 2016*** – A briefing on trends, strategies, and practices in corporate renewable procurement

PwC, ***Corporate Renewable Energy Procurement Survey Insights*** – A survey of US-based companies that asks about their renewable energy purchasing plans.

Solar Energy Industries Association, ***Solar Means Business 2016: Tracking Solar Adoption by America's Top Companies*** – An annual report that tracks solar adoption by large corporations in the United States.

World Resources Institute, ***Emerging Green Tariffs in US Regulated Electricity Markets*** – A regularly updated table of green tariff offerings available throughout the country.

World Wildlife Fund, Ceres, Calvert Investments, and David Gardiner & Associates, ***Power Forward 2.0: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value*** – A 2014 report that details how large companies are committing to and procuring renewable energy while saving money.

World Wildlife Fund, World Resources Institute, and Edison Electric Institute, ***Creating Renewable Energy Opportunities: Utility-Corporate Buyer Collaborative Forum Executive Summary*** – A summary report on a pair of 2015 meetings of a collaborative working group between utilities and large corporate customers aimed at aligning the parties' efforts to procure more RE.