

Holdren, is right, then the world community faces a monumental challenge. Ultimately, what we are discussing here today is the issue of global security. Global security, when we used that term in the past, we could identify the enemy clearly. It was the other super power. Now, we fear that we may be dealing with a far less coherent threat.

The immortal words of Pogo about an unpopular war in a far off land a long time ago have a haunting sound. "We have met the enemy," he said, "and they are us."

I understand there has been a shift in the balcony and many of you were not here for the two panels this morning. I can assure you that, aside from remarks by President Clinton and Vice President Gore and presentations by some of the leading experts in the world on the subjects, you didn't miss much.

[Laughter.]

MR. GALLUCCI: The panels this morning were excellent and I think they have added much to the discussion about what may be one of the most

important issues facing humankind today, global warming. This afternoon's program is just as impressive. We will start with a presentation by one of America's most astute analysts and most effective advocates of social policy, the First Lady of the United States.

After almost five years in the White House and 12 years as First Lady of Arkansas, Hillary Rodham Clinton has proven herself to be a tireless advocate for the less fortunate in society. She has fought for better treatment and cared for children with AIDS. She has helped developed pioneering in-home instruction programs for preschool youth. She has worked for better health coverage for all Americans. In these and many other initiatives, the First Lady has assumed a leading role in the struggle to improve the standards of living and the futures of children in the United States and throughout the world. That is why it is so important that she is here today as part of this forum.

History teaches us that in times of pain

and want, children usually suffer first and suffer greatest.

Once again, the First Lady is taking a leading role in protecting the interests of children by participating in the discussion of global climate change. We must study and understand this issue, work together and make decisions to preserve a healthy world for the generations that will inhabit this planet long after we are gone. The First Lady, through her courage, tenacity and grace, serves as a model for us all.

Ladies and gentlemen, it is my pleasure and my privilege to introduce the First Lady of the United States, Hillary Rodham Clinton.

[Applause.]

MRS. CLINTON: Thank you, thank you very much. Thank you, Bob. Thank you, Father O'Donovan for once again welcoming all of us to Georgetown, which just happens to be my husband's alma mater.

[Applause.]

MRS. CLINTON: I particularly want to

thank all who are gathered here as participants and observers of this important conference. I am delighted that there are so many students and young people, because certainly there is no member in the audience with more at stake than those who are just beginning to look into their own futures and chart their own courses.

I can think of no more fitting day for us to come together to discuss climate change than today, which has been designated as Children's Health Day in the United States since 1928. For all of those years, we have met every year, as I did again this morning at the White House, with people charged with the responsibility for looking after our children's health. Every year, we have evaluated how well we have done in dealing with those issues that most affect the well-being of our children.

Our grade as a country went up this year from a C minus to a C. That's not much to brag about, but we are making progress and, at least, the trend line is in the right direction.

But, certainly, to meet today, on Children's Health Day, in the context of this conference is to put an even brighter spotlight on what is happening and could happen to our children if we refuse or fail to act appropriately, for how we act in response to global warming will have a profound impact on the safety and well-being of children not only here in our country, but the world over.

One of the biggest threats children face is disease, particularly disease rooted in environmental causes. Millions of children under the age of five die every year from preventable, easily treated conditions like pneumonia, diarrhea, malaria and malnutrition. Thousands more are made sick from air pollution.

In recent years, I have seen the individual faces behind these statistics, a boy feverish with malaria in Africa, a girl perilously malnourished in Asia, an infant dehydrated from cholera dying in South America, children in our own cities, suffering from asthma, struggling to

breathe. There is no escaping the fact that growing bodies are more susceptible to disease, pollution and environmental changes than the rest of us.

And so, in a real way, it is for these children and millions more like them and those to come that bring us to this conference today because, as we have heard this morning from some of the world's leading scientists, the health problems that fall disproportionately on children are only going to get worse if we do not do something about climate change. So, I want to talk to you briefly this afternoon, not as a scientist or as someone prepared to recommend any specific policies, targets or timetables, but as a mother and a citizen with a longstanding concern for the health and safety of children.

While uncertainties about the particulars of climate change remain, while we do not know exactly, for instance, how much and how fast temperatures will rise, this much is clear. Global warming has the power to put more children at risk.

Let me focus on three health flashpoints, air quality, the spread of disease and food security.

One reason we should be increasingly concerned about global warming has to do with respiratory illnesses. Already as many as 40 percent of children seen in health clinics around the world are suffering from acute respiratory infections. It is likely that an increase in global temperatures will deepen this problem.

High pollution levels in many urban areas result in high levels of ozone and fine particulate matter. Studies tell us that, when these pollutants increase, the number of respiratory illnesses tend to rise, too. These pollutants can aggravate conditions like asthma. Over the last decade, the number of cases in asthma in the United States has jumped by 29 percent. Hospitalization rates have increased by six percent. The largest increases have been among children and young adults.

Today, asthma affects nearly five million American children. Last year, it led to more than

300 deaths. Children in urban areas are hit hardest. In New York City, for example, children are hospitalized at four times the national rate. Within the city itself, rates are three to five times higher for African-Americans and Latinos. A rise in temperature, it is thought, will likely hasten this trend.

Children in disadvantaged neighborhoods, those least likely to seek quality medical care, will be affected the most, but not child will be entirely safe. I notice the increase in asthma as I travel from children's hospital to children's hospital and meet with long time pediatricians who tell me with concern about the numbers of children they now see and how difficult it is often to monitor their illness.

Another reason we should be concerned with climate change has to do with the spread of infectious diseases. In 1995, infectious diseases, like malaria, cholera, dengue and yellow fever, killed more than 17 million people worldwide. Nine million of these deaths were children.

Increases in temperature hasten the spread of infectious diseases for two reasons. First, they shorten incubation periods. That means that the viruses, bacteria and parasites that cause these diseases can reproduce and spread a lot faster. Second, cool temperatures protect parts of the world from certain diseases. They serve as an important line of defense. Diseases that can survive in hot, humid Calcutta just aren't going to make it in Cleveland unless temperatures rise.

Take a disease like malaria, which is spread primarily by mosquitoes. There are a half billion cases of malaria every year. IN 1995, 2.1 million of these resulted in death, most of them of children under the age of five. Moreover, the threat of malaria is increasing with the emergence of strains are resistant to drugs. In Africa, for example, the spread of Chloroquine-resistant malaria has contributed to an estimated two to threefold increase in malaria-related deaths since 1984.

Those of you in business or government who

travel to Africa and Asia regularly, have been told, I am sure as I have by my doctor, that now taking malaria medication is absolutely a necessity, but whether or not it is good enough to withstand whatever strain is out there is an open question.

For this reason, higher temperature should be a matter of real concern. Areas that were previously free of malaria mosquitoes, such as mountainous regions in Rwanda and Kenya, are now reporting an influx of the insects. In Costa Rica and Colombia, mosquitoes that were never seen above one thousand meters have been spotted at twice that altitude.

The United States is not immune, as you saw from Diana Liverman's maps this morning. In fact, according to research by the United States Agency for International development, as a consequence of climate change, the percentage of the world's population at risk to malaria could increase from 45 percent to 60 percent, increasing the annual number of malaria cases by 50 to 80

million people per year.

The spread of water-borne disease could also be hastened by climate change. Warmer water temperatures breed and sustain infectious bacteria. Flooding that results from rising sea levels could put water supplies at risk. This could make a bad problem worse. 1.3 billion people already lack access to safe water; 1.9 billion lack access to sanitation. Again, children are most imperiled.

Unsafe water is the prime cause of the approximately three million childhood deaths annually, worldwide from diarrheal disease and the four million childhood deaths annually from pneumonia. In the developing world, diarrheal disease is the number one killer of children. Yet, I have visited some of the diarrheal clinics, most notably in Dakar and met American doctors there studying how low tech, cost-effective means could be used to treat diarrhea because they have seen it beginning to spread in places like Louisiana.

Third and finally, climate change can put food security at risk. Scientists predict that, as

carbon dioxide levels rise in the atmosphere, one of the consequences will be a shift in the zones of agricultural productivity. That could result in changes in crop, livestock and fish farming productivity, reduced availability of water for irrigation and loss of arable land.

These disruptions would likely cause local shortages of food supplies and the result would be hunger and malnutrition which would harm, in turn, children and pregnant women especially. To complicate matters, the countries most vulnerable to droughts and pest outbreaks and other factors, restricting food production are among the poorest in the world, places where widespread famine already takes a terrible human toll.

In short, climate change, as you are discussing today, has the potential to deepen problems we already face, problems that fall disproportionately on our youngest citizens. For this reason, we should address climate change, not just as a scientific or economic issue, but also as a health and safety one that should concern all of

us.

I know that, as parents, we think about our children. I believe that part of our obligation is to think not only about our children and grandchildren, but about all children. That certainly is how my husband sees it and part of his efforts to respond to global warming grow out of his overall agenda to build a strong foundation for the well-being of children.

We have made real progress toward that end, with a balanced budget that will help extend health insurance to five million children, with a Medicaid program and active legislation like the Family and Medical Leave and the Kennedy and Kassebaum Acts, raising immunization rates, trying to shield our children from tobacco and drugs.

The President has acted to see to it that our air, water and food are safe, by putting new standards on meats, seafood and poultry and signing a law to keep harmful pesticides off our fruits and vegetables. This summer, he put in place tough new air quality safeguards which will protect millions

of American children from the health effects caused by ozone and small particulates. Today's conference is part of the ongoing effort, not only of the President, but of all of us to safeguard the future of our youngest citizens.

The Bible asks if your child asks for bread, would you give him a stone? If he asks for fish, would you give him a serpent? If he asks for an egg, would you give him a scorpion? These are the oldest questions in the world and they remind us of the duties faced by every generation to see to it that, when our children, even before they're able to ask for themselves, are really asking us to make sure they have as healthy and safe an upbringing as possible by enabling them to inherit a world at least as good if not better than the one they came into.

Those questions also need to be on the agenda in discussing climate change, because the people who will be most affected are not here. They will not be in any of the rooms or any of the breakout sessions. They won't be able to follow

the very detailed discussions led by our panelists. They have a lot at stake and we should be sure that the questions they ask us are ones that we will be proud to answer in the future.

Thank you very much.

[Applause.]

MODERATOR: We will now have a very short hold while the Vice President comes back into the building.

[Pause.]

[Applause.]

VICE PRESIDENT GORE: Thank you very much. Thank you so much.

I hope everyone had a good lunch and I want to thank the First Lady for her comments. I want to move right into the third panel.

It is my great honor to introduce for the first comments, my colleague in the President's cabinet who, in my opinion, is a real superstar around the world and in our country. It is a great joy to work with our Secretary of State. On this issue, it has been particularly enjoyable to have

someone with her commitment and understanding involved in this, as she has been.

We will introduce the other members of this panel after the Secretary of State makes her comments.

Madam Secretary, thank you very much and please proceed.

SECRETARY ALBRIGHT: Thank you very much, Mr. Vice President and it is a real pleasure to be here with you on this occasion, on a subject that you have been talking about for a very long time and that we are all more and more aware of as the hours progress.

Let me just say, when I was a professor here in the '80s, which I dearly loved and sat in this room--

[Applause.]

SECRETARY ALBRIGHT: Maybe you all will have me back.

Let me say that, the students that I had used to listen to me on a regular basis make the following kind of statement, which was that as we

were looking at what national security threats were and would be, I used to say, when the last time I looked, the United States was still behind two oceans, safely protected from missiles and various armed attacks, but there were other threats that we were less aware of and less capable of dealing with.

We had the most porous borders to the north and south and also porous borders from top and bottom and that we really did have to be concerned about what were threats to American national security from climate. It was kind of weird thing to say in the 1980s and a lot of students wondered what I was talking about.

We did begin to think about how the curriculum here could be changed so that students would become more aware of how to deal with these kinds of threats and how to study about them and how to work with them and to protect the United States. So, it seems particularly appropriate to be here with this very illustrious group talking about climate change and disruptions and how it

affects the United States and the entire world.

We do know from your various speakers this morning what is going on. I won't repeat that in my non-scientific way, but clearly the impact of what is happening is global and it must be addressed on a global basis and we must act and so must others. But to do so effectively, we need to develop a consensus on what to do, how and when to do it and by whom it should be done.

Our efforts begin with the United Nations' Framework Convention on Climate Change open for signature at the 1992 Rio Summit, a convention that the United States was the fourth country and first developed nation to ratify. Two years ago in Berlin, the parties to that convention recognized that we were not doing enough under the Framework Convention to meet its goal of stabilizing the emission of greenhouse gases.

In Berlin, we adopted a mandate for talks that would lead to tangible steps taken by developed countries and continued consideration by developing countries. A year later, in Geneva, the

United States led an achieving agreement that such commitments be binding. The talks will reach their conclusion in Kyoto, Japan this December.

Although this process has generated momentum toward concerted international action and created a greater level of public awareness, the job of building a consensus is far from complete. The consensus we need must be domestic. It must extend to others in the industrialized world and it must become the basis for a common approach between developed and developing nations. The consensus at home must be founded on a recognition of strong scientific evidence that global climate change is occurring and will have harmful effects. It must rest on confidence that our leadership in high technology and industrial innovation will allow us to adjust to emission limits without losing our competitive edge, and it is dependent on an assurance that other countries, including those in the developing world will do their fair share in meeting the challenge.

The consensus among the industrialized

nations must grow from the understanding that this is a serious issue, requiring a serious response. Solutions will come through a long term process, not a popularity contest. It does no good to pay lip service to unreachable targets. At the end of the day, we will be judged not by the targets we set, but by the standards we reach.

The consensus between developed and developing nations will be the most difficult to achieve. We're not there yet. We must begin with the understanding that responsibilities are mutual even if not identical. The United States, as we have now heard many times, has four percent of the world's population and we do emit 20 percent of the greenhouse gases. Clearly, we and other major emitters must take the first step. But if the major emerging economies of the developing world do not accept their responsibility to follow, we will not achieve consensus and we will never solve our shared problem.

To move toward this triple consensus, we need proposals that are unifying, not divisive,

both within the United States and in the community of nations. The administration's approach is based on the view that all countries have the same interests because we're all in the same boat in minimizing the harmful impact of global climate change. Every nation contributes to the problem. Every nation will benefit from a strong response.

Accordingly, an agreement should bind each to terms that are effective, appropriate and fair. We have already proposed and will work to put in place measures that support innovation such as trading or selling emission rights, measures that encourage technological development and measures that reward a country for the assistance it provides to another.

Finally, we're looking for a time frame that is not so short as to be unachievable and not so long as to dilute effectiveness. We want the flexibility to develop strategies for implementation that will allow us to take advantage of technological advances and new insights into the science of global climate change.

So, in response to some of the television commercials that have aired recently let me say that the United States is interested in a proposal that will be global and that will work. This afternoon, we have brought together seven distinguished panelists to spur new exchanges and creative thinking on three aspects of the challenge we face in building U. S. leadership for an effective response to climate change.

How do we insure meaningful and equitable and participation from a range of countries in the face of growing energy needs and expanding technological possibilities? What challenges will developing countries face in attempting to limit greenhouse gas emissions and how we can work with them to meet those challenges and what steps can we take to build the kind of consensus that I have discussed between developed and developing countries regarding the need for addressing this problem on the basis of mutual interests and mutual responsibilities?

And now let me introduce our panelists.

Jessica Mathews, President of the Carnegie Endowment for International Peace; Richard Schmalensee, Director of MIT's Center for Energy and Environmental Policy Research and former member of the Council of Economic Advisors; James Wolfensohn, President of the World Bank; Daniel Yergin, President of the Cambridge Energy Research Associates and Pulitzer Prize winning author; Mae Jemison, head of the Jemison Institute of Advancing Technology in Developing Countries and a former astronaut; E. Linn Draper, Chairman and CEO of American Electric Power and Fred Krupp, Executive Director of the Environmental Defense Fund.

Now, let me turn to a fellow panelist, who is a person, as I have said earlier, who is the driving force of those of us that have cared about climate change and someone who is the embodiment of what needs to be done as we move into the 21st century, my very good friend, the Vice President of the United States.

VICE PRESIDENT GORE: Thank you very much.
Good job, Madam Secretary.

[Applause.]

VICE PRESIDENT GORE: Thank you, Madam Secretary, thank you very much for that very concise overview of where we stand now on the eve of this international negotiation.

I'm going to turn right now to Jim Wolfensohn, President of the World Bank.

As we heard this morning and as was clear from the Secretary of State's comments, one of the central questions the world has to deal with in grappling with this issue is the relationship between the developed countries and the developing countries.

In your comments, Jim, if you could touch on what the developing countries have at stake in solving this or not solving it and what it means to them to have it done in a way that does not threaten the economic vitality of the developed countries.

MR. WOLFENSOHN: Thank you very much, Mr. Vice President and Madam Secretary.

I think I have three minutes to represent

4.7 billion people.

[Laughter.]

MR. WOLFENSOHN: That doesn't give me a lot of time per person.

Let me say, first of all, that I think everybody agrees in the developing world on the science, that there is a problem and it needs to be solved and the developing world is the place it gets hit most. Climate change affects the poor the most. As the First Lady said earlier, vector-borne diseases affect the poor. Water affects the poor. I won't chronicle those issues which affect those in marginal areas, but let me say that it affects very much our thinking on development.

The issue of development is an issue which is of importance to the developing world, but let me respond, Mr. Vice President and say, it's an issue for all of us. It represents 40 percent of our exports. In just a few years, the five major countries in this world, India, Indonesia, Brazil and China, will represent not eight percent but 18 percent of the world's GDP and that is integral to

our own activities.

It is not something which is separate, so when I talk about the developing world, let us not think this is something we can decide on separate from our own thinking. It is a problem that is integral to ourselves. We breathe the same air. We have the same problems. We have the same immigration issues. We have the same trade issues. What happens in the developing world is an issue for us. It is not just an issue for the developing world.

Looking at the developing world, what we see is a world that has not created this problem. It is a problem that has been created by the developed world. And so, from the point of view of our clients, they look at this issue and say, yes, it's a real problem, but why is it a problem that we have to solve. Well, the answer that they come up with and that they have come up with repeatedly in all the international arrangement is that, they are happy to have common but differentiated responsibilities. That is the phrase that has been

used in all the treaties.

So, the developing world is not seeking to exclude itself from responsibilities. It is a question, as the President said this morning, of when and how. That is an issue of equity. That is an issue which we need to face in terms of development, because we're already facing up to the problem of how can we assist the developing world reach a level where it can be an economic force and where we can have both peace and stability.

I remind you that, there are two billion people that live under two dollars a day. There are a billion, three hundred million people that live under a dollar a day. There are two billion people who don't have access to electric power and, therefore, burn fossil fuels which themselves affect the atmosphere. This is not a trivial issue. Ninety million people are being added to that number every year.

So, it is an issue which is of importance, somewhere where there are already inadequate resources to bring that group into a level of

equity in the world. Without a level of equity, you cannot have peace and stability. And you cannot have trade and you cannot have a world that for your children is going to be viable and stable.

Now, let me respond to one other aspect. We talk about the cost, the cost we are looking at in terms of the morning advertisements, in terms of generally accepted accounting principles.

But what is not included in the cost is the cost in terms of future costs, the cost in terms of the erosion of our environment, the cost to our children. What use is it to have a profit today if our children and our grandchildren will not have an environment in which they can live?

And so, the decision for us as leaders is a decision of how it is in both the developed and developing world that we can confront the issue of carbon emissions and a global environment. That is not something that can be dealt with by simple current accounting principles. It is a question which the President and the Vice President are focusing on. It's a question of leadership.

What the developing world is looking for is an issue of leadership by the developed world to take the steps that will allow the developing world to certainly conform as they go down the line, to participate as they go down the line, but be given the necessary breathing space in which they can get their house in order and where they can reach a certain minimum level of viability. That is an issue that the World Bank is assisting in, and which the United States is assisting in and other donor governments are working.

This is an issue of development. It's an issue of poverty. It's an issue of equity. It's an issue of morality. I believe that, by having this conference, we are focusing on an issue that is not just of importance to those 4.7 or three billion or 1.2 billion people. It is a problem that is of importance to every one of us.

VICE PRESIDENT GORE: Thank you very much.

[Applause.]

VICE PRESIDENT GORE: Thank you very much, Jim. Really good comments. I am hoping that at

the end of this panel, we will have time to come back and explore some further questions.

Yet, I want to turn right now to Professor Richard Schmalensee, Professor of Economics at MIT, former member of the Council of Economic Advisors.

On this question of developing country participation, what are your views?

PROFESSOR SCHMALENSEE: Mr. Vice President and Madam Secretary, I think the developing countries have a critical role to play, particularly if you think about this problem in its long run aspect. A couple of slides that John Holdren used this morning, I think, illustrate that point nicely and one of them will appear, I'm sure.

[Laughter.]

PROFESSOR SCHMALENSEE: Maybe not.

If you recall the slide contrasting business as usual emissions with the global emissions, with global emission levels necessary to stabilize atmospheric concentrations, the one before that, actually, stabilizing atmospheric concentrations called for a dramatic reduction in

global CO2 emissions, the green path versus the ascending path.

The ascending path has in it improvements in energy efficiency at sort of historic rates. The green path calls for a dramatic transformation. That will require new technology. That will require, I believe experience makes clear, sharp increases in the price of energy.

The second slide that John used this morning, makes clear that developing countries will have to participate and play a central role in any such transformation, simply because they are the locus--there is the slide--of emissions growth. Even cutting developed country emissions to zero will not suffice to follow that green path, unless the developing world also acts.

The third factor is, it is unrealistic, I believe, to expect developing countries to devote significant resources of their own to this issue, given all of the immediate problems they face. We need to think about separating what is done where from who pays for it.

Now, with this sort of long run perspective, obviously investment in technology has a critical role to play, but so, I believe does strategic choice and investments in institutions.

As I look at, at least, some of the rhetoric in the current negotiations, it envisions a sequence where the developed world makes sharp reductions in emissions and the developing world then follows, a deep then broad architecture, if you will. The problem with that--there are two problems. First, it doesn't attend to the problem of resource transfer, the problems of institutional development necessary to include the developing world fully. It postpones those difficult issues.

Secondly and, perhaps more importantly, reducing emissions in the developed world, particularly by raising the price of energy in the wealthy countries, will induce migration of energy-intensive industry to the developing world. It will tend to lower world energy prices faced by developing countries. It will, therefore, tend to make it more difficult later for those countries to

join in any global effort if, indeed, we need to make significant transformations of the global economy.

Therefore, I applaud all the discussion today of including the developing world initially and I think it's strategically critical that the developing world be on the train as it leaves the station; that we worry more about that than about how fast the train departs the station.

Thank you.

VICE PRESIDENT GORE: Thank you very much.

[Applause.]

SECRETARY ALBRIGHT: Yes, let me now carry on from the question of how the developing world grows. We have heard an awful lot about how developing countries have to take our commitments.

Dr. Yergin, I wanted to address this to you, to find out how we can allow the developing world to grow and what are their energy needs. Of the energy options open to them, which are the most likely to help them reduce greenhouse gases? Because if they are going to grow, they clearly

will in some way have to be able to fuel their growth.

DR. YERGIN: Madam Secretary, Mr. Vice President, ladies and gentlemen, thank you. Thank you for the question.

Listening to the superb and very thoughtful discussion this morning, I really come away with the sense that the essential challenge is, how do you integrate these global climate change questions with rapidly growing energy consumption. And it is going to grow fast. By the year 2010, 13 years away, we're looking at consumption that may be 35 percent higher than it is today, most of that growth coming from the developing countries, Asia and Latin America.

As the President said, it is the result of good things, higher economic growth, higher standards of living, free markets, freer trade. That then puts a question for the developing countries. I think that there is no question that they are environmental conscious. They can't avoid it. It's brought home to them.

You know, the devastating impact of the haze in Southeast Asia really makes it clear. The media calls it a haze, but it's really like being next door to a burning house. It's terrible.

But the developing countries do see the--

DR. YERGIN: [In progress] environmental policies is markets. Markets work, market-oriented systems bring things faster in surprising ways, more innovation, solutions, they deliver results. And I think there has been a recurrent tendency to underestimate the possibilities of technological change.

We can look at what is happening in the energy field and we see it's happening: Highly efficient natural gas use, dispersed power, more efficient combustion of coal and, of course, lots of things in terms of efficiency.

But the challenge, of course, is how to bring about cost-effective development and dispersion in a sensible way but I think we can say there that the developing countries certainly want to have 21st century technology rather than 20th

century technology if the can afford it.

The other thing that can make a big impact soon is here today. That is natural gas which has a lot of, does much better in terms of carbon emission than other fuels. The trends are very favorable.

You have a big resource base that is growing, you have a global gas business, technology is having a big impact but we have to think differently. We have to see the potential and the potential is very large in terms of the growth of electric power in Asia and Latin America.

When we look at it we see that the potential is much greater than people think but it involves large cross-border projects. So, you need to strive to overcome the obstacles, build confidence, conviction and mutual dependence. And here is where you can have an impact at the very heart of growing world energy demand.

You know, when you get to Kyoto, you are going to hear from the Europeans who will be speaking from a very high moral ground about what

they are achieving. How have they done it? They've done it by creating this great natural gas system that takes gas from Siberia, from the North Sea and North Africa and moves it into Europe.

Well, if we want to see an impact in the region of fastest growing energy consumption we have to envision another system that takes the Caspian, Central Asia, South Asia, India, Southeast Asia up into China, Korea, Japan, Siberia, a new natural gas system. And in terms of global climate change, the type of things we've been looking at on those screens, the sooner we do that, the better. There will be many benefits from an integrated energy Asian natural gas system that will respond to your question from tying economies together, building cooperation, affording a platform for growth, helping to assure electricity for hospitals, schools and factories and addressing directly and in a very positive way the issue of global climate change.

SECRETARY ALBRIGHT: Thank you.

[Applause.]

VICE PRESIDENT GORE: Could I just, before you call on the next speaker, I just wanted to make a brief comment. When you talked about the Europeans speaking from a high moral platform and you referred to the Siberian gas and North Sea gas, it's also the fact, is it not, that the common reference to the 1990 base year means that countries such as Germany anticipate being measured against the last year when the most inefficient, most highly-polluting industrial plants in the entire world were spewing out CO2 and other pollutants from East Germany. And when they were shut down and newer technologies were adopted instead, it's very easy for them to meet that base.

I mean they've also done some things that we haven't been willing to do and it's not all attributable to that. But it is kind of a freebie for them in some respects.

DR. YERGIN: Yes, it's a big bonus.

VICE PRESIDENT GORE: And similarly, the base year for Great Britain includes the period just before the great upheaval that former Prime

Minster Thatcher brought about in the British coal industry and just before the big substitution of natural gas for coal. So, to some extent, it's a freebie for them, too, isn't that right?

DR. YERGIN: Absolutely. And they moved in gas to fill the void of coal.

VICE PRESIDENT GORE: And, again, they've done some things, in addition to that, that we have not been willing to do, so, they deserve credit for what they have done. But the degree of difficulty for them is different. If this were an Olympic diving event, they would not have a high degree of difficulty assigned to their performance.

[Laughter.]

VICE PRESIDENT GORE: But, anyway, excuse me.

[Laughter.]

SECRETARY ALBRIGHT: We've all watched those.

Dr. Jemison, you have done a lot of work on getting sustainable technologies to developing countries. Can these economies grow sustainably

and how can sustainable energy programs help the world's poorest inhabitants?

DR. JEMISON: Thank you, Secretary Albright and Vice President Gore. That's a great question for me because the first thing I want to say is, yes, the economies can grow and in a sustainable way. But to put that in a framework, I think the first thing I need to do is just say that sustainable development is improving the quality of human life now in such a way that the ability of future generations to grow and develop are not compromised. So, that's what we are looking at.

And let me put a face also on development in several different countries. We first go to Thailand where a photovoltaics plant has been providing energy to a rural area but, yet, next to it is a growing stack of car batteries, lead-acetate car batteries because that's the only way energy is stored.

We go to South Africa where a grandmother is preparing a meal inside her house in a shantytown; yet, there's a cooker, an electric cooker

that has recently been connected next to it where her granddaughter is coughing.

And then if we go to Houston, Texas, where I am from, we see Jed fueling up his new super-duper, four-wheel drive vehicle with 23-gallons of gasoline that costs \$1.32. The commonalities here are striking because we are looking at unsustainable development and innovative or new technologies, the technologies that individuals have acquired, and they acquired this technology because it was their aspiration. They were fulfilling their own individual needs and desires.

So, what we have to understand is when we talk about sustainable development we have to take into account and address not just public policy and national policy but what individuals want to do because that's going to be the driving force for development.

We have already heard this morning quite a bit about emission standards for developing countries versus developed countries. But let me add a little additional context. More than 3

billion people worldwide live in the rural areas of developing countries and 75 percent of the energy use in these areas come from noncommercial sources of fuel, which means firewood, animal manure and agricultural byproducts.

These are not counted in the market place, yet, this is what is providing the energy source for around 70 percent of the world's population.

And, so, yes, providing sustainable energy could have a very strong effect on their lives as well as ours here in the United States and around the world. How can sustainable energy development help? It can help, first of all, by increasing agricultural production, through water pumps and irrigation. It can help by enhancing telecommunications because now you can get information back and forth, whether it is information on when to take goods to the market place or if it's information on distance learning. We can improve transportation in getting goods to markets. We can improve clean water and, thereby, limit the number of diarrheal diseases and other

water-borne diseases. We can bring support services into the area by health clinics, education and we can slow rural to urban migration.

And the way that this happens and what we can do to help this is by changing the paradigm in which we are trying to supply power, not looking at centralized power production but rather looking at decentralized power production and alternative types of energy.

So, if you can take a solar photovoltaics panel into rural areas then you can use that and if you can also use mini-hydro power. There are a number of ways to do it but the most important thing is to decentralize power production because it allows rural areas to grow and develop.

The last thing I want to add is we have been talking about why we should be doing sustainable development, sustainable energy production, and most of the time we have talked about economies and whether it is good for health and safety but the one area I think we have left out is our human responsibility to each other and

to our future. That's the reason to do it, as well.

[Applause.]

VICE PRESIDENT GORE: Thank you, Dr. Jemison, very, very impressive presentation.

I would like to call now on two panelists back-to-back, Dr. E. Linn Draper, who is President of American Electric Power, one of the largest U.S. power utilities and also, Fred Krupp, who is President of the Environmental Defense Fund.

And I would like both of you, if you would, to discuss flexibility measures, including some of the ones that have been touched upon already like emissions trading rights nationally and internationally, and the subject of joint implementation where countries enter into partnerships and reductions in one place are the result of combined work by companies and others in different countries.

We often talk about getting an agreement at Kyoto that includes flexible market-based mechanisms such as joint implementation and

trading. So, maybe we ought to spend a little time talking about how they work.

If you could go first, Mr. Draper, and then you, Fred Krupp.

DR. DRAPER: Thank you, Mr. Vice President, and you, Madam Secretary. We heard a lot this morning about the potential consequences of global climate change and we heard some about the technologies that could be used to reduce those effects. It seems to me that what we really need to talk about is what actions can be taken to ensure that these techniques are deployed.

It seems to me there are two relatively simple things at least in concept that need to be done. One is to devise a system that encourages early action and the second, recognizing that this is a global problem, encourages action to be taken where it can be done most cost effectively, whether it is in the country in which the business normally resides or whether it can be done somewhere else.

It is quite clear that the cost of implementation and deployment of these various

technologies is not the same around the globe and if we can deploy the technologies in other countries more cheaply than we can in the United States then it seems to me that it is in everyone's best interest to do that. It is good for the globe, it is good for the country to which the technology is transferred and it is good for the United States whose technology is being used elsewhere, it will provide employment both here and abroad.

We have at the moment some 26 projects that are approved joint implementation projects. Joint implementation, as the Vice President said, is a project that is deployed in another country for which credit will ultimately be given. These 26 projects are of a variety of types. They include renewable energy, fuel switching, energy efficiency, land use projects and the like, and it's clear that they are effective.

One of things that people are concerned about is that early actions before the rules are established will not be given credit and if things

are done abroad, adequate will not be given. If we can devise a system that will give assurance that credit will be given for these early actions, wherever they occur in the world, then I can assure you that more than 26 projects will soon exist.

These 26 projects have been quite successful. They will sequester 180 million metric tons of carbon dioxide at a cost of \$515 million. That is very cost effective compared to what could be done in the United States.

My company and a number of others are involved in one in Bolivia. It is the largest joint implementation project in the world and, Mr. Vice President, you will recall about a year ago you were in Bolivia to participate in that signing ceremony. It is called the Noel Kemoff Mercado Climate Action Project.

It is a program to sequester carbon dioxide in the forests of Bolivia. The money was used to expand a national park. The expansion, alone, is bigger than the Yellowstone National Park. It is a huge geographic area. Over its

lifetime of 30 years it will sequester 53 million metric tons of carbon dioxide at a cost of 37 cents a ton. It is incredibly cost effective.

If we could duplicate projects like that around the globe we would take a long step toward solving the problem that we are discussing, but it requires a system to be constructed that will give credit for early action and credit regardless of where that action is taken.

Many of these projects, such as the one that I described that my company participates in, has other benefits as well. This particular area is one of unusual flora and fauna. It will preserve the natural habitat for exotic species, both of plants and animals. So, you not only get the benefit of reduction of carbon in the atmosphere but there are clearly ancillary benefits such as eco-tourism, preservation of wildlife and the like.

And it seems to me that if we are smart enough to devise the right scheme to allow early credit to be taken and credit taken wherever we

take the action in the globe, you will see an enormous outpouring of voluntary activity.

VICE PRESIDENT GORE: Great. Thank you very much.

[Applause.]

MR. KRUPP: Well, Mr. Vice President, I couldn't agree more with Linn Draper on the importance of early action. It is refreshing to have the head of an environmental group and the head of a major utility agreeing on that point. It's critically important for the environment and also important for the economy.

You know, Madam Secretary, you said at the outset that we have to make sure that we have targets that are not just lip-service and they have to be combined with a workable plan. And the plan that the United States has come up with provides for a very effective way to cut greenhouse gases because what it does is it incorporates a lot of things that we heard this morning.

For one it is a plan that allows us to save money. It's a plan that will spur new

technology and the third thing it will do, that we have all agreed is important, is it is a way to draw in developing countries.

Let me explain. The Administration's proposal would achieve these goals by creating a market for greenhouse gas cleanup. It would provide incentives, therefore, for cost reductions, for new technologies, and for the developing countries to participate.

It would do this by setting up a budget for each nation. Each nation could emit a certain amount of pollution over a certain budget period, let's say, ten years. Any country that emits less would earn a savings that it could then sell to other countries who could emit more.

Overall, though, the total greenhouse gas emissions would be limited to the budget amounts. And what this would do would be to give countries and individuals the financial reasons to reduce emissions so that they would be earning credits.

During a budget period, companies that invest in pollution control opportunities in

another nation where the costs, as Linn said, of control are lower, would be earning credits that they could sell to other companies or other countries or else apply them to their own future emissions control obligations. That is what we mean by the, joint cooperative approach or joint implementation.

What it would do is it would create new export markets for U.S. greenhouse-friendly technologies and it would be important in the international context, as Mr. Wolfensohn has said, because it would allow a transfer of technologies to the developing nations and a transfer of capacity that they will need to protect critical resources like rain forests which are important absorbers of carbon in the atmosphere.

Lastly, I would say that as the President mentioned, under the acid rain system we are well-ahead of schedule in reducing sulphur emissions at well below the projected costs.

VICE PRESIDENT GORE: One-tenth of the costs.

MR. KRUPP: One-tenth of the costs that many in industry estimated and that's why I so agree with the point that Linn has just made and the point that was made this morning that we need to find a way to give companies and countries incentives to reduce early because we will see, then, early reductions.

The costs of delay to the environment will be very real. And those are not only environmental costs but, I think, economically the best thing we can do to assure a soft economic landing, if you will, is to make sure that the steepness of the curve of reduction does not end up having to be so dramatic. And, so, to avoid the dramatic and draconian reductions later, I would urge that we begin on a path of reductions as soon as eight years from now, in other words, by 2005. I think we can do better than 1990 levels.

[Applause.]

VICE PRESIDENT GORE: Thank you very much.

Thank you very much, Fred, and thank you for your great work on this issue.

I just wanted to briefly say, on behalf of the President and myself, this concept of credit for early voluntary actions is one that we support. Now, working it through the system and working it in Kyoto and all of that, that's another matter. But I would hope that the final result definitely does include credit for early voluntary actions.

I know there is opposition to it and maybe there are some disadvantages to it, but the advantages far outweigh the disadvantages in my opinion.

Madam Secretary.

SECRETARY ALBRIGHT: Let me address a question to Dr. Mathews. I can just say, Jessica and I worked together in the Carter Administration and it was really thanks to her that I was smart enough to even talk about climate change when I taught here.

So, Jessica, you have studied this a long time from the perspective of both science and foreign policy considerations. Could you elaborate for us what you see are the broader national

security interests that the United States has in seeking this kind of a global agreement?

DR. MATHEWS: Madam Secretary, it is a big question to get at. I see that we are facing basically in these negotiations three questions: How, who and when, as you have suggested in your opening remarks.

The most important issue, I think, to understand about the how question is that this is, in my view, the most difficult issue that has ever been negotiated internationally, period. In terms of the breadth of involvement of these gases in the entire economy, the breadth and variety of impacts, the persistent uncertainties, the long time scales, no negotiation that I know of approaches it in complexity and difficulty.

Moreover, all the mechanisms that are going to be needed are going to have to be invented. Even the sulphur model that is employed domestically is a pale shadow of what is going to be needed internationally.

The design, the accounting, the

monitoring, the enforcement, all of these things have to be done for the first time and we know when we do things for the first time you always make mistakes. So, it puts an added difficulty on this regime that it be extraordinarily adjustable.

On the who question, as much as this is the most difficult negotiation that has ever been attempted, I think it is also, it is potentially as divisive a one as has ever been attempted.

In terms of the difference between past and future contributions, in terms of the differential impacts between countries and regions, and the interconnectedness of every country, the word adaptation has virtually not been mentioned today. I think I have not missed it.

One thing we do know for sure is that the climate, while we are negotiating all of this and implementing, is going to be changing. And there is going to be a lot of very expensive adaptation that is going to have to be done willy-nilly and the developing countries are perfectly well aware that they are the most vulnerable to this change

that will have to be adapted to. That in terms of money and technology and human capital, they are the least equipped to do it. They are not blind to that reality.

On the question of when, this one is in some ways the toughest I think. It is ironic that after 25 years of very hard work on the science we are now 66 days from Kyoto and if you think that our understanding of the physical science, despite all the uncertainties, is somewhere up here and our understanding of the natural science is somewhere down here, our understanding of the social science is way down to the floor.

And the policy--

VICE PRESIDENT GORE: Where is the political science on that?

[Laughter.]

DR. MATHEWS: Well, I'm including the political science down there with the social science. We do have to, we don't really have as good a grasp--and I don't mean we, Americans, I mean anybody--on all these mechanisms.

Whether we should be measuring concentrations, emissions, whether we should be using taxes or tradable permits or in what combination, how joint implementation would work, if it would work, all these things, our readiness to act on this is nowhere near the level of our understanding of the science.

I would say that probably the only thing we know for absolute certain on this is what has been proved in the five years since the Rio Summit which is that voluntary actions won't work and that is progress. It was probably a stage that we had to go through.

So, what to expect out of Kyoto? First of all, don't expect instant regime. It generally takes more than a decade to negotiate and implement a global regime. The record is the nuclear nonproliferation treaty took seven years under the threat of nuclear holocaust. This one began in about 1990, so, we're doing not so bad.

And Kyoto, this round of negotiations is the beginning of a very long process. So, that's

the first thing.

A key point then is to ask ourselves what defines success and failure in Kyoto. For my money, success in Kyoto--I think I have a pretty low threshold here--would be a commitment on the part of the developed countries to go first with some specificity as to how fast and when--not necessarily the full answer on target, some timetables--and a promise by the developing countries to go second.

If we could come home from Kyoto with that, that in my book anyway, would be success.

Finally, the President had mentioned this morning, made a passing reference to something that is terribly important and that is that we have got to ratify whatever we ultimately come home with. The only international agreements that have ever been attempted that have required congressional approval that are as broadly, have as broad an impact on our economy as this one will, are the multilateral trade agreements and for Congress to deal with those we have needed fast track.

We have needed an admittedly undemocratic, not very transparent process. And the reason we've needed it is because it is so hard to negotiate and then ratify something with this many economic impacts.

So, the how question on the back-end, what we can swallow once we have bitten it off politically, is just as important as what we can go to negotiate.

What I think--those are some of the parameters to answer the question of the national interest here. I would simply say that the engagement of our national security interests in this issue measure up to the complexity that I have just described.

[Applause.]

SECRETARY ALBRIGHT: Jessica, if I could just ask you, as you raised the political dimension of this, one of the problems that one deals with as there are critics of this whole concept is, are we giving up American sovereignty when we sign on to a climate change treaty.

How do you deal with that question when you are talking to the American public on this?

DR. MATHEWS: Every international agreement you give up a little piece of sovereignty in order to get something more back, well-being and security. This issue was raised with the ratification of the GATT treaties, as well.

I think the reality is that in the world that we live in ceding tiny bits of sovereignty bite after bite is the name of the game.

VICE PRESIDENT GORE: Let me just mention one thing about your comments concerning the multilateral trade agreements. I agree that this is so pervasive in its relationship to the U.S. economy, there is really nothing else like it in the environmental field.

But I think that in some respects we can learn from what happened in the Montreal Protocol, the international treaty by which the world community began to address these emissions into the atmosphere that were found by the scientists to destroy the stratospheric ozone layer.

And many years after the scientists, Sherwood Roland [ph] and Marion Malina [ph] leading the way, for many years after they laid out the scientific evidence, finally the nations of the world got their act together enough to enter into this agreement that had sort of broad goals and started moving us in the right direction and that was in 1987.

We just had the tenth anniversary of it.

But then, after those broad goals and mechanisms were put into place, the evidence became ever clearer and the support among peoples around the world for taking stronger action began to grow significantly.

And the fact that we were beginning to make progress and move in the right direction elevated the confidence level that we could solve the problem and then all of a sudden there were follow-on treaties that had the world speed up dramatically and it ended up like the case was with the sulphur emissions trading, it ended up being only a tiny fraction of the cost projected by some

of the economic studies, and we are now well on our way toward solving that problem.

We have got a long way to go, we have got some tough problems to handle, still, but we are way down the road toward solving that problem. I think that is an analogy also. Because I think that if we can get the right kind of agreement in Kyoto then as the evidence builds to make a broader, stronger consensus possible, we will be able to move much faster in the years ahead.

DR. MATHEWS: I think, Mr. Vice President, that that's exactly right. And one hears the argument made about chlorofluorocarbons, the same one that is made about sulphur, well, that is a much tinier bit of the economy.

VICE PRESIDENT GORE: Smaller, much smaller.

DR. MATHEWS: But I think it is also true that Mr. Casten's answer this morning was exactly right, which was that where somebody else saw difficulty, he saw opportunity.

VICE PRESIDENT GORE: Right.

DR. MATHEWS: It is true that what happened with the CFCs was that it looked impossible, there was even a very famous study that concluded that the cost of CFC substitution was infinite because there were some uses for which there was no conceivable substitutes.

Well, it turned out that there were plenty but there had never been a reason to try, right? These were cheap, they were useful, they were benign, down here on the earth. And, so, who knew? There was never a reason to look. So, it looked like there were no substitutes.

In the energy field we know that there are a whole closet-full of technologies sitting out there, many of which cannot get in the market place because energy is just too cheap. And, so, we know there are, I think you said it and pointed the way before, the political science of this is tougher than either the economics or the energy side.

VICE PRESIDENT GORE: Well, thank you very much.

And before we close this panel and invite

the members of the fourth panel to come out, I want to ask the Secretary of State, Madeleine Albright, if you have any concluding comments?

SECRETARY ALBRIGHT: Yes, thank you very much, Mr. Vice President.

Thank you to all the panelists. Let me say that I have looked at this from the perspective of the State Department as a brand new and interesting challenge in the following way. As we have begun to study it, it is evident to me more than any other subject that I have ever dealt with that it includes everybody in the United States Government.

And when Jessica says it is the most complicated negotiation ever internationally, if you consider that it has so many internal dimensions in the United States, it obviously has those same dimensions in other countries. And, therefore, it is a tick-tack-toe game of all kinds of dimensions that we have to work with that is a huge challenge to all of us as we look at the domestic and international aspects of this.

And we have found that in the government by engaging the interagency process in this we are learning a great deal more about our own economy, about climate, about the way we work with developing countries, how we relate to developed countries so that it is a massive project which I think ought to be seen as a challenge in the way that we are going to do foreign policy in the 21st century.

So, I find it a very important and challenging goal for all of us to work this out and I am very grateful that we have had this particular day. Because I think it is a way that we are going to be looking at lots of problems in the future.

And I thank you all very much.

[Applause.]

VICE PRESIDENT GORE: Thank you.

You know, as President of the Senate, I often have the responsibility of presiding over the Senate and one of the common phrases used by the presiding officer there is, will those please engaged in conversations in the aisles, please,

take their seats and cease all audible conversation. I never thought I would use that anywhere outside the Senate Chamber.

I want to thank all of you for joining us for this fourth and final panel today. I am very pleased to be joined by my colleague, the Deputy Secretary of the Treasury, Larry Summers. I am going to call on Secretary Summers for the first presentation and I am going to ask him to introduce our colleagues on the panel here and then he and I will share the moderating responsibilities. But, Secretary Summers, please, lead off.

DEPUTY SECRETARY SUMMERS: Thank you very much, Mr. Vice President.

As a member of the President's Economic Team I am glad to be here to discuss this critical issue. I think it's very clear that the global warming threat is real. There is now a consensus that if we fail to limit global emissions of greenhouse gases there are likely to be real effects in the form of higher temperatures, a disruptive climate and potentially very important

disruptions in the functioning of the global economy.

Anyone who doubts that climate has important economic implications need only look at the impact of El Nino. Droughts and other El Nino effects have already prompted several governments to declare a state of emergency and have put a severe dent in the production of many of the world's most important foodstuffs.

The world's commodity traders now monitor El Nino almost as closely as they monitor the Fed. And the catastrophic insurance industry has been paying very close attention indeed, because of its concern with the effects of hurricanes, to the threat of global warming.

The question is not whether we can respond effectively to that threat. We can and I believe we must. More than 2,000 economists, including eight Nobel Laureates, several members of this panel, have concluded that there are policy options that would slow climate change without harming

American living standards and that these measures may, in fact, improve productivity in the long run.

Economists can contribute to the effort to combat global warming by helping us to answer two central questions. First, they can help us decide on the goals that we should set for ourselves, on what path can we best achieve our environmental objective and our economic objective, as well.

Second, and perhaps more important, certainly as important economic analysis can inform our search for the best way forward to meet our given goals of choosing the best way forward, which I think several of our panelists will suggest is based on a flexible market-based approach. It is important for the economy and it is important for the environment as well, because if we act in as inexpensive a way as possible we will be able to act to the maximum extent.

We have with us to discuss these issues a distinguished panel of experts including Robert Repetto, from the World Resources Institute; Rob Stavins, from the Kennedy School of Government;

John Sweeney, Chairman of the AFL-CIO, perhaps an honorary economist for this occasion; William Nordhaus, from Yale University; and Richard Sandor, the Vice Chairman of the Chicago Board of Trade.

VICE PRESIDENT GORE: Well, thank you very much, Mr. Secretary, and I will now turn to Bob Repetto for the next comments.

And in your comments, Bob, please, address this question: What is the optimal approach in your view that would allow us to act aggressively to reduce emissions without damaging the economy in the process and how would a policy along these lines be structured?

MR. REPETTO: Mr. Vice President, thank you.

You know, there has been a great deal of analysis on this issue. There have been hundreds of simulations with dozens of economic models and as I read it, five essential elements come out of this.

First, as others have said and as Larry Summers just said, using market-friendly economic

instruments such as selling carbon permits that firms can trade in the market place or phasing in carbon taxes will be much more efficient than command and control regulatory systems.

Second, using revenues from these policies to reduce business tax rates can stimulate employment and investment without increasing the budget deficit. Offsetting the effects of higher energy prices with tax cuts can substantially improve economic outcomes.

Thirdly, as many people have said, creating an international system of joint implementation or carbon permit trading that involves Eastern Europe, the Former Soviet Union and important developing countries can lower the cost substantially and provide important economic gains for all parties.

Fourth, an active technology policy program to accelerate the development and diffusion of renewable energy and energy saving technologies, if supported by appropriate market price signals, can substantially reduce the long-run costs.

And fifth and finally, providing clear, credible, consistent policy signals as early as possible to reduce uncertainty in the economy and allow business and the public enough time to make appropriate plans and investment decisions will reduce short-run dislocations.

If this approach is taken, carbon emissions can be reduced without damaging the economy. Well over a dozen economic modeling studies have analyzed the issue. Even the most pessimistic find that emissions can be stabilized at 1990 levels by the year 2010 while the economy continues to grow at almost its long-run trend rate.

Under the worst case assumptions, the growth the United States economy is likely to expand over the next 20 years, about a 50 percent rise in real GDP, would instead take 21 years to achieve. That is essentially the worst-case scenario.

However, if these elements are adopted in an optimal approach, these analyses find that--

adopting these policies would allow American living standards to rise more rapidly over the next 25 years than if we do nothing.

Mr. Vice President, in closing, I would like to mention the impact of these policies on the competitive position of U.S. industry abroad. Of course, our main trading and investment partners in the OECD countries have already indicated their willingness to do as much as the United States will in reducing greenhouse gas emissions and, so, competitive impacts within the OECD will be negligible.

It is also important to recognize that the largest industrializing countries, including Russia, China, India, Brazil, Poland and others, since 1990 have taken significant steps to reduce energy subsidies. A World Bank report indicates that they have gone down by 50 percent, they have raised energy prices already relative to prices in the United States and have opened up and reformed their energy sectors to make them more efficient. They have done so not to protect the climate but to

restructure their faltering economies, but in the process, have already contributed to the solution of the climate problem.

If they go second, these energy sector reforms are likely to continue because their motivation is economic self-interest and sustainable development in their own economies. For these and other reasons, I believe that U.S. emissions can be reduced without a flight of factories and jobs to other countries.

Thank you.

[Applause.]

VICE PRESIDENT GORE: Thank you very much, Bob. I hope we will have time to come back and explore some of this.

DEPUTY SECRETARY SUMMERS: Bill Nordhaus, you have done some of the most widely cited analyses of the economic implications of policies to impact on global warming. What are your thoughts about the best way forward to go in terms of reducing emissions?

PROFESSOR NORDHAUS: Well, I guess at the

end of a day talking about the future it is time to call out the economists and ask, how much is it all going to cost?

As I listen to this and have read this, I am concerned that we are greatly underestimating the size and complexity of the undertaking and my message is that we must move cautiously so that we protect our economy as well as our environment.

Let me start with costs. What people are urging is to reduce emissions in the United States to 1990 levels by the year 2010. Just to be clear, this according to most studies, this involves reducing emissions by about 30 percent relative to business as usual.

Now, from an economic point of view, that is a very large cut. I looked at the studies, including the Government Interagency Task Force, and I was struck by the close similarity of the projected economic impacts there to the energy price shocks of the 1970s.

If you look at the studies, most of them find that these targets will involve raising energy

prices sharply, approximately a doubling of wholesale energy prices and approximately a 300 percent increase in the price of coal. And this is actually larger than the price increase during either of the oil price shocks of the 1970s.

And, so, I think the thing we have to be concerned about is to make sure that we don't bring an energy price shock upon ourselves because this was, after all, the worst economic period in the United States since the Great Depression.

Now, you might ask, will technology bail us out? And I have no doubt and I think there has been a lot of evidence for this for many years, that there's great potential for technological savings, from the light bulbs we talked about this morning, to the fuel cells and on to advanced power systems.

But I think the evidence of the last quarter century, as well, is that we are not going to introduce these wondrous technological miracles unless people face higher energy prices. As we heard in the last session, energy is too cheap, too

cheap to get us out of our utility vans, too cheap to make us look at all our systems.

When will we change the light bulbs? When it is economically imperative to do so.

Now, I want to say a word about risks and damages because there's been a great deal of economic work on this. Most economists who have looked at this believe there are major long-run environmental, economic and political risks involved in global warming and there have been dozens of studies on the impacts on such sectors as agricultural, sea-level rise, health and energy.

And, so, economic studies have tried to ask, what is a sensible balancing of the economic costs and the costs of adaptation, on the one hand, with the climate risks on the other? The answer is, we should move ahead, we should strive for slowing the growth in emissions, we should move to increase the prices of fossil fuels.

I think a very attractive model that comes out of these studies that would be something that marries the U.S. proposal of tradeable permits that

we heard about in the last session with a target price of carbon in the order of \$10 a ton for carbon, plus or minus whatever sensible margin seems necessary.

And this would compare with numbers of about \$100 a ton of carbon which are the ones that would be involved in current proposals.

So, in summary, we do need to slow the greenhouse express. If we do nothing there is a risk that we are going to crash into the reefs.

But at the same time if we step on the brakes too quickly we may crash through the windshield. So, what we need is a kind of middle ground which raises energy prices gradually to give the proper signals to consumers, producers and technologists and to put us on a more sustainable and sensible path.

Thank you very much.

[Applause.]

VICE PRESIDENT GORE: Well, thank you very much. In other words, avoid shocks to the economy. In 1973 and then again in 1978 and 1979, the

increases were immediate, dramatic and sudden. In this case, whether prices are involved or not, whether it is trading regimes, joint implementation or whatever it should be over a long enough period of time and in a gradual enough process to allow the forces of the market place to help us accomplish our goals as efficiently as possible.

PROFESSOR NORDHAUS: I would emphasize that point. It's very important, as people look out and they ask how are we going to build these new buildings, what kind of power plants are we going to build, what are we going to equip them with, what kind of cars are we going to buy, that people look out and expect that things are going to get a little tighter and we ought to move a little away from the fossil fuels that we are using.

And, of course, the way, as unhappy as it is, as unpleasant as it is, the real way people see that signal is when they see they see the prices rising or they expect them to rise. But the message is, gradual is much less costly.

VICE PRESIDENT GORE: Thank you very much.

I want to turn now to Robert Stavins, who is Professor of Public Policy and Chair of Environment and Natural Resources of that Program at the John F. Kennedy School at Harvard.

Professor Stavins, what are your thoughts on this?

PROFESSOR STAVINS: Well, Mr. Vice President, and Mr. Secretary, I think we can safely say that no one in this room is interested in just paying lip service to what is obviously a very important global problem. So, the first thing I would like to state is to note that voluntary initiatives or wishful thinking are simply not going to be able to do the job of meeting the kind of CO2 emission targets that have been discussed in the United States and other countries.

If the targets are, themselves, serious, if they are aggressive then either very serious command and control standards or very serious and meaningful price signals are going to be required. At this point, we have 30 years of experience that has taught us something. It has taught us that

market-based instruments, in this case essentially, energy taxes or tradable carbon permits can transmit those price signals and they can bring about the changes that are needed. Changes in fuel use, in the short-term movements from coal to natural gas in established facilities; changes in technology, by which I mean commercialization and diffusion throughout the economy of those technologies that the Department of Energy study has identified as being technically feasible; and also energy conservation to lower overall energy demand.

Price signals can do that and the studies that have been carried out by Bill Nordhaus and by others, indicate that they can do it at a savings of 90 percent or more of the overall cost of abatement compared to a conventional or let's call it old-fashioned way of doing the job.

Now, both Bob Repetto and Bill spoke of taxes so I'm going to turn instead and focus on that other market-based instrument tradeable permits. Because something else we have learned is

that tradable permit systems can be designed well or they can be designed poorly.

And in the United States we have the experience of doing both. So, I want to make a few suggestions. The first one is if there is a model for carbon trading and I hesitate to say that there is, it is not necessarily the highly successful sulphur dioxide allowance trading program but it just might be EPA's phenomenally successful phase-out of the lead in gasoline in the 1980s which was also accomplished by a tradeable permit system among refineries.

My point is that we should not be captured by the notion of thinking of CO2 emission permits but by thinking of upstream carbon content permits traded among primary producers of fossil fuels and among importers.

Secondly, if these permits are auctioned and there are arguments economically of why they ought to be, those revenues ought to be fully rebated to the economy through cuts in taxes, on labor and taxes on capital.

Third, despite, again, the great success of the tradeable permit program for sulphur dioxide, and I think it is a success that anyone who has cared about these instruments applauds, we shouldn't misread the evidence. Careful analysis of the fact that the prices have come down as much as they have tells us there is nothing there, unfortunately, to suggest that carbon trading is going to be miraculously cheap.

Fourth, I want to emphasize something the Vice President said that is exceptionally important and that is that time matters. It is not just the flexibility of allowing the control to take place in appropriate locations but allowing it to be spread out over time as with the case of banking of permits.

Finally, the cost with any domestic instrument is going to be much lower if it is combined with broad-based, international allowance trading. Not simply what is currently described as joint implementation.

So, in conclusion, if we are not

interested in simply paying lip service to global climate change, and again I'm assuming that no one in this room is, then I think the only option that is really credible is for the United States to use market-based instruments.

Thank you.

[Applause.]

VICE PRESIDENT GORE: Very good, thank you so much.

I wanted to ask a brief follow-up question. You were quoted last week in the New York Times as supporting a kind of economic safety valve mechanism whereby we would cap the cost of a given policy so that if there were some kind of miscalculation then there would be a safety valve. Can you explain this idea?

PROFESSOR STAVINS: Certainly, Mr. Vice President.

This approach addresses a fundamental dilemma. The dilemma is, on the one hand, some people, including many in the business community but many others as well, fear that meeting

specified targets is going to be exceptionally costly. They might be right, I don't know.

On the other hand, many others, including many in this room and many in the environmental community, predict that it is going to be very cheap and, indeed, some early panels would say, costless, to achieve these targets. And, again, I don't know. I will be agnostic on that and I don't think any of us really knows.

A compromise that would address the interests then of both of these groups of their concerns would be a system that essentially links an emission target with a safety valve for the case of unexpectedly high costs. Now, this approach has been proposed by a number of researchers, the University of Texas, the World Bank, and Resources for the Future.

And it would work essentially like this. The government will allocate permits, enough permits in order to meet the precise targets that the government chooses and, at the same time, the government will state up-front that it will offer

for sale additional permits at a given price, for example, \$10 per ton of carbon content of fossil fuels.

If the optimists on this--I will call them the environmental advocates--are right, if it turns out to be exceptionally cheap to reach that emission target, we will reach the target, we will do it at low cost and we will all be exceptionally happy.

On the other hand, if it turns out that the pessimists on this issue, the cost pessimists, are correct and it costs more than that to reach the targets then, in fact, we will be capping the permit price at \$10 per ton, we will be capping marginal abatement costs, we will be capping the costs to private industry at \$10 a ton as well.

So, this kind of hybrid policy instrument which combines features of what is normally thought of as a tax but works completely through a tradable permit system works because what it does is make the target, itself, sensitive to the costs. And I think this is the kind of instrument that could

really set us on the path to taking what the President described earlier this morning as moderate but disciplined first steps. In other words, a good beginning.

VICE PRESIDENT GORE: Great, thank you very much.

I want to call now on my friend John Sweeney. And, John, I know that organized labor has serious concerns about how a policy to deal with climate change might affect working men and women in this country and, particularly, how it might affect the number of jobs and the nature of the job market.

However, I know from my discussions with the folks who are working on this in the AFL-CIO, that there is widespread recognition that this is a real issue that must be dealt with. So, what kind of policy would you recommend to address the environmental problem we face while protecting our economy and our workers?

MR. SWEENEY: Well, first of all, I want to thank you and the President for your leadership

on this and for this conference today and I am happy to be with Secretary Larry Summers, as well. We, in the labor movement, feel that regardless of which study you examine the economic stakes for the United States are enormous. And we really feel that it is essential that we do whatever we do carefully.

Our share of global carbon emissions is so large that even modest reduction measures, if not done carefully and with enough time to manage difficult adjustment questions, could have catastrophic economic effects. In any event, the magic of the market is not a sufficient tool. We must plan and plan carefully. We must begin to make the investment in new technology and new carbon suppression measures now.

The keys to doing this and doing it the right way are taking enough time and being clear as to our ultimate objectives. There is nothing magic about 2010 or any other target date and there's nothing magic about 1990 emissions levels.

Rather the decision about a target date

should really be based on taking enough time to manage the economic transition and the emissions target must follow not precede a discussion about the global concentration level that the entire world community seeks to achieve.

None of this is to say that we should not act. We should. But we must act thoughtfully and with a clear intent. With a clear intent of protecting our economy, and the women and the men who have made that economy successful, the most productive in the world.

We think the American people will understand and appreciate the sacrifices that are asked of them if we speak to them rationally about sensible solutions to carbon reduction. Loose talk about more jobs sometime in the future is not an adequate response to those who face job loss now and those who will see entire industries, entire communities disrupted if we do not get this right.

We ought to be guided by some core principles. Whatever we do, we must assure global environmental repair. If it does not, we cannot

and should not ask American workers to pay a known price for an uncertain outcome.

Every nation must participate on an equitable basis. We must not create incentives for job and investment to move elsewhere. We must put in place and assure adequate funding for a just transition regime that forces us to plan ahead and create the sort of environment and economy that we all can have.

Thank you.

VICE PRESIDENT GORE: Thank you very much.

[Applause.]

MR. SUMMERS: Richard, you are a man who operates in markets where there is trading every minute of the day, 365 days a year. We've heard a lot about the concept of trading emissions as well as pork bellies.

Maybe you could give us a feel for your experience with the acid rain trading program and discuss the lessons of your experiences in trading for policy in this area.

MR. SANDOR: Thank you, Mr. Vice President

and Mr. Secretary, and I, too, would like to commend the White House and all of you for giving us the opportunity to hear this private sector viewpoint.

I will take a contrary opinion. I'm very excited about the possibility of market-based solutions for the environment. While I do see a difference between the SO2 market and the carbon market and I do recognize the very intelligent viewpoint of Dr. Nordhaus and Stavins and my other colleagues, here at the panel, I think there are more similarities than there are differences.

I think in the early days of debate and the policy opinions, the questions that were asked at that particular time people said, let's set fines at \$2,000, let's have auctions at \$1,500, the best minds said \$600. The auctions started five years ago, prices went from \$300 to \$250 to \$200 to \$150 to \$100 down to \$70 a ton. We went slowly, we learned, we implemented.

There was a big debate at that time. Some of it was it was too large and too comprehensive

and the other was there were too few sources to make a difference. In fact, we did cut a middle ground.

People worried about quasi-property rights, how would they fit in the securities markets. Would we accept quasi-property rights and liens and things of that nature. Could we adapt arcane swap documentation which is used to hedge interest rates to trade sulphur dioxide? And the answer to all of those questions was a very simple and a very dramatic, yes.

The question now going forward is what are the steps that we should take to mitigate carbon emissions? I am concerned about the problem, I think the problem is one that we all have to be concerned about and I'm particularly concerned about its irreversibility.

Right now the market is already taking some actions as we speak. It is an inchoate market right now. Arizona and New England trades are occurring between sulphur dioxide and carbon. In May, the company that I represent and who I am

speaking on behalf of, Centre Financial, did a very small trade in Costa Rica, monetizing 1.1 million acres or the first of it.

We have a mandate from the government of Costa Rica to create 1.1 million acres, 4 million tons of rain forest protection credits which have been certified by the Department of Energy as CTOs.

We have something and I believe social scientists call it the demonstration effect. I think in Washington you call it flying a balloon and seeing what's happening.

DEPUTY SECRETARY SUMMERS: Trial balloon, yeah.

DR. SANDOR: Trial balloons. Well, the demonstration effect is throw up a price and see what happens. We threw up a price of \$20 and people came to us and said, we can basically take landfills, co-generate power and reduce methane. Other people came to us and said, we can, in effect, take solar power which is being used in Arizona and if you can monetize, just give us a small amount of credit for dollar reductions, that

makes it viable.

Top soil, if you could plant vegetation and get paid for the carbon created. That is not only good for the farmers but it also might have some monetization value.

All of these are signals and the \$20 a ton which is the highest cost, unlike Mr. Draper's of \$1 or \$2, that turns out to be at today's price, and it is the only price I know and Mr. Secretary the one only a trader can act under, is a penny and a half per gallon of gasoline. That is the market price right now to get some carbon emissions from now for the next 20 years on land that goes in perpetuity in Costa Rica.

Price signals are very important. And I never underestimate inventive activity or the role of entrepreneurs who take on bold tasks whether it is in chips or communication or in markets, or the ability to trade not only pork bellies, but mortgage-backed securities, other devices which make us the envy of all capital markets.

In conclusion, I would like to say we

think a limited voluntary program, voluntary in the sense that nations opt-in to participate, voluntary in that sectors, in the second sense, may opt-in to help generate price transparency would give us a better idea to slowly move toward this goal.

I think Dr. Mathews is right, we need a framework, we need a slow framework and if we can move into that and if the policy makers can give us the infrastructure for markets, let some of us practitioners try to bring that price down so there are no effects on the economy.

[Applause.]

VICE PRESIDENT GORE: Thank you very much, Richard, that is very intriguing.

Is there a separate trading pit for sulphur dioxide?

DR. SANDOR: Unfortunately, we are at the point where we conduct the auctions outside of a pit environment but we are and have had approved by the Commodities Futures Trading Commission both a future for SO₂ and options on SO₂. So, we may, in effect, have them pit-traded.

Now, they are just traded by an auction market.

VICE PRESIDENT GORE: Well, we were speculating what, how long it would be before we had carbon derivatives and you've already got sulphur dioxide derivatives.

DR. SANDOR: Yes. And they are in effect with these trades I mentioned now carbon derivatives. Environmental derivatives is what we like to call them, Mr. Vice President.

VICE PRESIDENT GORE: Excuse me, I'm sorry, environmental derivatives.

You said that these sulphur dioxide instruments are now selling for \$70 roughly?

DR. SANDOR: They bottomed at \$70 and are now trading at roughly \$90.

VICE PRESIDENT GORE: \$70 to \$90 is the current range?

DR. SANDOR: Yes.

VICE PRESIDENT GORE: And at the beginning the predictions were that they would be at how many hundreds of dollars?

DR. SANDOR: In 1990, the predicted levels ranged from 4 to 800 tons. The EPA was pretty aggressive at \$600 and some private sources were as high as \$1,000 a ton.

VICE PRESIDENT GORE: Why do you think they were so wrong?

DR. SANDOR: For several reasons. There were some unintended consequences. Part of it was due--and we have to look at it realistically and candidly--was reduction in rail rates that came about, deregulation. So, that Western low-sulphur coal was substituted.

The second part was scrubbers and technology by the GEs and the Sea Brown Brevares. [ph], the others were fuel switching and the flexibility.

I think what all of us will believe is the flexibility that a market-based system made compliance basically be able to be implemented in a cost-effective way and over a longer period of time.

VICE PRESIDENT GORE: I'm going to offer

an additional hypothesis as to why the projections were so high. And I do so as a non-economist and with apologies and appropriate humility and I will ask for comments if anybody thinks I'm way off base here.

I have long felt that just as in any profession there are certain conventions in the economics profession that are necessary and highly valuable in order to make the profession operate the way it does. But one of those conventions that I think sometimes causes problems is the assumption of perfect information.

The idea that all other things being equal, the information about what choices are available and what the best courses of action might be are readily apparent or will shortly be readily apparent to anybody who looks for them and, therefore, the economy is operating at or near the optimum allocation of the resources that are available. You understand the point I'm getting at?

DR. SANDOR: Yes.

VICE PRESIDENT GORE: And that's a necessary assumption but it is not always accurate. The classic joke is about the economist who walks down the street and a \$20 bill is laying there and he does not stoop over to pick it up because it wouldn't be there, it is obviously not there because if it was somebody would have already stooped over to pick it up.

[Laughter.]

VICE PRESIDENT GORE: And I think that some of the options for squeezing sulphur dioxide out of the environment at much lower levels of cost than turned out to be possible were assumed not to be there because if they were there they would have already been picked up.

And similarly, I think that sometimes when we are on the verge of a new set of assumptions about how things are going to operate we, for the purposes of common sense, we say, well, we need to calculate these costs on the assumption that the low-hanging fruit or the easy choices if they were actually that profitable they would already be

showing up somehow.

But just as a pump needs to be primed, the perception of and selection of the most cost-effective options needs to be lubricated by the liquidity of trading in the new ideas that have not even been looked at previously because they haven't been examined. There is a, I don't know, stickiness is a word that economists use. There's a certain stickiness that people have that keeps them stuck in the old way of looking at what is available and what is not available.

And, therefore, when we start priming this particular pump and moving into a carbon emissions trading, I think that it is much more reasonable to assume that we don't have perfect information at all. We have no idea how many opportunities are out there to have very large savings at much lower costs because we haven't really felt the need to break out of our old way of looking at it and look in a new way.

Now, if you would like to comment or Professor Stavins?

DR. STAVINS: Far be it from me to take on defending the 22,000 members of the American Economic Association. So, I will focus a little more on what I think is an important point you are raising, Mr. Vice President. And certainly I should not be interpreted and I think most economists should not be interpreted as slamming the SO2 tradable permits program. I worked very hard with Secretary Wirth at the time to coax the Bush Administration into developing and proposing that program to the Congress which enacted it.

But I think it is very important that we learn correctly from the lesson so that we design better and better systems for global climate change. And the reality is that although it is true that very, very early on in the history there were numerical estimates of \$1,000 a ton trading, that if you look at the final estimates for the final legislation that was enacted that included something like a \$3.5 million bonus allowances given out to utilities that, in fact, the predictions were about \$170 to \$200 a ton.

You combine that with what Dr.--

VICE PRESIDENT GORE: They were only off by a factor of 300 percent.

DR. STAVINS: No, but I haven't--

VICE PRESIDENT GORE: Okay, I'm sorry.

DR. STAVINS: I'm going in the direction.

VICE PRESIDENT GORE: All right.

DR. STAVINS: You're right. So, so far, so where you are left then with this gap of \$70 to \$100. And Dr. Sandor has correctly pointed out that the deregulation of railroads which brought down freight costs for Powder River Basin low-sulphur coal to move it to the east, played an enormous part of that. And in addition to that, there are several other factors that suggest that it could be that the abatement costs are actually higher than what the permits are reflecting.

Public Utilities Commissions are possibly restraining the trade in these permits as economists and I think most people would desire that that permit trading is free. There is the property rights issue because the Congress said

this is not a property right.

So, my suggestion is that we learn from those lessons, the property rights and all the other ones, to design a better tradable permit system, a credible one for global climate change.

DR. SANDOR: And I would agree with that hypothesis. I do question or having been involved in making some of the first trades in the SO2 market, and having debated bid and offer prices, looking at that inefficient market, I found a much higher estimate just on one person's experience.

I do think the Vice President is 100 percent spot on that this is an illiquid, inefficient market.

And right now somebody will make an argument that it is a \$100 ton and as a market practitioner I would like to ask them, could I sell that to you at that and the answer is often, no, I would like to buy at \$4 or \$5.

So, now, we have a market, \$5 bid, \$100 offered and somewhere in between--

[Laughter.]

DR. SANDOR: --somewhere in between it trades, Mr. Vice President and I think that is far lower than what people think.

VICE PRESIDENT GORE: And it is more fun when there is a pit, isn't there?

DR. SANDOR: Yes.

VICE PRESIDENT GORE: If we do carbon, there is going to be a pit for carbon.

DR. SANDOR: We like the hand waving and open outcry.

VICE PRESIDENT GORE: There's got to be a pit for carbon.

Bill, did you want to comment?

PROFESSOR NORDHAUS: Yes. I just wanted to say I think there are a couple of lessons here. The first is if the best minds in this area, and these are not just economists, these are utility executives, these are people who do estimates in the environmental community, are off by a significant amount, whether it is 100 percent or 500 percent, then I think the lesson there is there are really great uncertainties.

And I think we ought to carry that over here and say there really are large uncertainties. Whether it is a \$1 a ton or five cents a ton or \$100 a ton, I don't think I want to stake my reputation on one particular number.

I think we need to design our policies with the idea that there are large uncertainties here.

VICE PRESIDENT GORE: I think that's another argument in favor of the kind of safety valve approach that Mr. Stavins mentioned before. We have run out of time but if any of the panelists here want to make any other comments, I will certainly--

Well, if not, let me just mention briefly that two members of our Administration's economic team who were not recognized earlier due to an oversight, include the Chairman of the National Economic Council Gene Sperling [ph], who has been integral to this entire process and who has been a Co-Chair of the President's process, along with Katie McGinty and Dan Tarullo, also with the

National Economic Council.

And earlier, when Secretary Albright was here, I wanted to acknowledge the members of her team, my long-time colleague, Tim Wirth, who is here, also, Stew Eizenstat and others.

And I want to thank everybody who has been a part of today's panels. It has been a very, interesting experience for those of us who have been able to participate in it. Many of you will be attending the reception a little bit later at the White House and I will look forward to seeing you there.

Just in closing, let me express the hope that by listening to the evidence brought forward by the experts and the practical perspectives of non-experts we have all learned about the risks of global warming, as well as some of the approaches that will help us reverse it.

As you take these thoughts home with you, please, continue to consider how you might manage the problem from your own perspective.

President Clinton and I strongly believe

that we must build our economy and protect our environment all at the same time and that we can do that best by tapping the inventive ideas that arise in the minds of the American people.

On behalf of the President, I want to thank Todd Stern and the team of people who have helped him in coordinating this. I think they have done an outstanding job. I want to thank all of you for coming and in closing would like to ask all of you to join me in thanking the members of our final panel.

[Applause.]

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In The Matter Of:

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[6] 10:00 a.m.
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PROCEEDINGS

[1] **MODERATOR:** Good morning. Welcome to
[2] Georgetown University and the White House
[3] Conference on Climate Change. Before we start our
[4] program this morning, we ask that you please note
[5] the nearest emergency exit. In addition to the
[6] third and fourth floor main entrances, there are
[7] also two emergency exits at the rear of the stage
[8] behind the large screen TVs. Also, please exercise
[9] extreme care around the lighting equipment
[10] upstairs, and be mindful of cables.
[11] Now, please welcome Georgetown
[12] University's Women's A Capella Group, The Grace
[13] Notes.
[14] [Applause, followed by vocal selections.]
[15] ["Hail To The Chief played."]
[16] **MODERATOR:** Ladies and gentlemen, the
[17] President and Vice President of the United States,
[18] accompanied by Georgetown University President
[19] Father Leo J. O'Donovan.
[20] [Applause. "Hail To The Chief" played.]
[21] **MODERATOR:** Ladies and gentlemen, please

Page 5

[1] remain standing for the singing of our national
[2] anthem.
[3] [Anthem not on audio.]
[4] **FATHER O'DONOVAN:** Mr. President, Mr. Vice
[5] President, members of the Cabinet. It's a little
[6] bit like welcoming an ocean wave as you all sit
[7] down. Mr. President, Mr. Vice President, members
[8] of the Cabinet, members of Congress, distinguished
[9] guests, faculty and students of Georgetown
[10] University, good morning and welcome.
[11] Since half the United States Government,
[12] or more, is here this morning, I want you to know
[13] that I have asked several Jesuits to stay in the
[14] chapel to play [sic] for your welfare.
[15] Georgetown is deeply honored to host the
[16] White House Conference on Global Warming.
[17] Throughout this day, our President, Vice
[18] President, First Lady, Cabinet secretaries, will
[19] engage us in their ongoing national dialogue about
[20] one of the most significant challenges before us
[21] today. We will consider, too, the opportunities
[22] inherent in addressing that challenge.

Page 6

[1] As the President and Vice President have
[2] noted since the earliest days of their
[3] administration, attention to global warming is
[4] imperative. We now know that for the first time in
[5] the history of our species, we are changing the
[6] environment that supports us more quickly than we
[7] are acting to adapt to those changes.
[8] This knowledge brings with it profound
[9] implications. If we continue on this course, we
[10] face the prospect of a world that does not foster
[11] and sustain life but perhaps threatens it.
[12] At the United Nations special session on
[13] environment and development this summer, the
[14] President exhorted us, Government, universities,
[15] business, labor, citizens, to work together to
[16] address this problem. He challenged us to direct
[17] the same ingenuity and determination that has made
[18] the United States the world's leading nation toward
[19] developing the technologies that will conserve
[20] energy, renew resources, and dramatically reduce
[21] the greenhouse emissions that induce global
[22] warming.

Page 7

[1] He has suggested that such efforts can
[2] bring both the long-term benefit of preserving our
[3] environment and the immediate benefits of creating
[4] new jobs, and positioning us as the world's leader
[5] in an emerging technological enterprise.
[6] Georgetown has had firsthand experience
[7] with this possibility. We are very proud of our
[8] ongoing work with the Department of
[9] Transportation's Fuel Cell Bus Project, which has
[10] resulted in the development of quieter, cleaner,
[11] more efficient vehicles.
[12] And we look forward to continuing to
[13] contribute to the dialogue on global warming and
[14] other pressing environmental issues through the
[15] Georgetown Center for the Environment.
[16] To spur further common work toward the
[17] goals the President has outlined, he has brought
[18] together here industry leaders, scientists and
[19] scholars, economists, environmental policy makers,
[20] and authorities on international affairs to
[21] exchange ideas and to explore solutions.
[22] In anticipation of the international

Page 8

[1] conference on the reduction of greenhouse gases to
[2] be held in Kyoto in December, we will consider not
[3] only our potential and obligations as a nation, but
[4] also the ways in which we can—and must—join
[5] forces with all the nations of the world to find a
[6] global solution to this global problem.
[7] Around the world, we must define ourselves
[8] more broadly than we may be accustomed to doing—thinking of
[9] ourselves not just as individual
[10] nations, but truly as part of the human community.
[11] And we must accept our collective responsibility as
[12] custodians of the earth.
[13] As a Jesuit university, Georgetown has a
[14] special interest in today's dialogue. Since the
[15] days of Ignatius, Jesuits have "sought God in all
[16] things"—in our fellow human beings and the
[17] elements of our existence, in the plants giving us
[18] life and the creatures of our fields and forests.
[19] As Jesuit poet Gerard Manley Hopkins put it, for us
[20] "the world is charged with the grandeur of God."
[21] When the Society of Jesus came together at
[22] our 34th Congregation in 1995 we, of course,

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[1] renewed our commitment to the promotion of justice
[2] as a fundamental part of our mission.
[3] In doing so, we thought about some of
[4] justice's "new dimensions," such as a concern for
[5] the environment arising from a commitment to
[6] "preserving the integrity of creation" for the
[7] generations to come.
[8] And so, Mr. President, Mr. Vice President,
[9] we are deeply grateful to you for your remarkable
[10] leadership and vision on this issue. And we are
[11] delighted that this extraordinary group gathers in
[12] this hall today, named after Georgetown's first
[13] student, bringing remarkable specialized knowledge
[14] and abilities to our shared interest in the well-being of
[15] humankind.
[16] Welcome, again, and it's a very great
[17] pleasure, ladies and gentlemen, to introduce to you
[18] the Vice President of the United States.
[19] [Applause.]
[20] VICE PRESIDENT GORE: Thank you very much,
[21] thank you, thank you.
[22] Thank you very much.

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[1] Thank you very much, ladies and gentlemen,
[2] thank you.
[3] And, Leo, thank you, for your kind words,
[4] we are very grateful for the hospitality and for
[5] your leadership on so many important matters. And
[6] on behalf of the President, who I will present to
[7] you in just a moment, I want to acknowledge some of
[8] the distinguished guests who are here and, please,
[9] forgive me in advance for overlooking some because
[10] I look around here and I see that this is an
[11] audience filled with distinguished individuals.
[12] But I want to start by noting that
[13] practically the whole Cabinet is here, with the
[14] Secretary of State, Madeleine Albright and the
[15] Secretary of the Interior, Bruce Babbitt. Secretary
[16] of Agriculture Dan Glickman the Secretary of Energy
[17] Federico Pena, the Secretary of Transportation
[18] Rodney Slater, the Administrator of the
[19] Environmental Protection Agency Carol Browner, the
[20] Director of FEMA James Lee Witt, our UN Ambassador
[21] Bill Richardson.
[22] Also, we are joined by the Chair of the

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[1] Council on Environmental Quality Katie McGinty, the
[2] head of USAID Brian Atwood, the President of OPIC
[3] George Munoz, the head of USIA Joe Duffy and others
[4] and some members of Congress, who are here,
[5] including Senator Pat Leahy, and Congressman George
[6] Miller and Congressman Sam Farr and there may well
[7] be others. Again, I apologize for overlooking
[8] anyone.
[9] Also, the Chair of the Council for
[10] Economic Advisors Janet Yellen; Jack Gibbons, the
[11] President's Science Advisor, Tim Wirth at the State
[12] Department, a lot of other individuals who are here
[13] including leaders of environmental organizations
[14] and business groups, and many others.
[15] Well, it is an honor to open this White
[16] House Conference on Climate Change and to welcome
[17] such a large and diverse and distinguished group to
[18] address the challenge of global climate disruption.
[19] I want to begin by thanking President Bill
[20] Clinton for conceiving of and hosting this
[21] conference, and for his outstanding leadership in
[22] shining the public spotlight on the risks of global

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[1] warming, and for helping focus national and
[2] international attention on this growing problem.
[3] I am not the only one who has come to
[4] expect this kind of leadership from a person who,
[5] in the last five years, has earned the right to be
[6] called the Environmental President. He has led
[7] landmark initiatives to protect the quality of our
[8] land, and our air and our water and preserve our
[9] natural resources. Doing it while, at the same
[10] time, launching an American economic renaissance.
[11] No future leader of this country will ever
[12] again be able to say to America, we have to choose
[13] between building the economy and preserving the
[14] environment because this President has proved that
[15] you can do both and that both reinforce each other.
[16] And we thank you, Mr. President, for that
[17] leadership.
[18] [Applause.]
[19] VICE PRESIDENT GORE: Global climate
[20] disruption represents one of the single greatest
[21] threats to our future. This view, which I have
[22] just expressed, is based on a mounting body of data

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[1] which establishes beyond any reasonable scientific
[2] doubt that emissions of greenhouse gases are
[3] changing our climate.
[4] This morning you will hear evidence from
[5] some of the world's leading scientific experts on
[6] the global climate. You will hear also from
[7] experts on other important aspects of climate
[8] change who will tell us how technology can help us
[9] reduce emissions, how we need to take a global
[10] approach and how various policy options have the
[11] potential to affect our economy.
[12] My role in these few minutes of welcome is
[13] not to summarize or foreshadow their findings but
[14] to set this issue in its appropriate historical
[15] context. Those who have dealt with the issue of
[16] global climate disruption over the years have had
[17] to battle the first obstacle which is a feeling on
[18] the part of many that since the earth is so large
[19] and we are so small, how could we possibly alter
[20] the fundamental composition of the global
[21] atmosphere?
[22] But, as the facts come rolling in, it is

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[1] abundantly obvious that there are new realities we
[2] face. We are adding a billion new people every ten
[3] years now, a China's worth every decade. That is
[4] something fundamentally new in human history. And
[5] the powerful new technologies that have come out of
[6] the still accelerating scientific and technological
[7] revolution have vastly magnified the average
[8] ability of each one of those new billions of people
[9] to have an impact on the environment.
[10] Those technologies have brought us many
[11] blessings, but they have also brought some
[12] unintended consequences that we didn't think about
[13] very much in advance. If the growth in population
[14] had not been accompanied by the advances in
[15] technology it might not have changed the
[16] fundamental relationship between human kind and the
[17] earth but these two factors together, coupled with
[18] our approach to them, have now really altered the
[19] effect that human kind can have on the earth's
[20] environment.
[21] And, of course, the atmosphere is the most
[22] vulnerable part of the earth's environment because

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[1] it is so thin, relatively speaking, and we are now
[2] able to alter its composition.
[3] We cannot turn back; we must look ahead.
[4] And in looking ahead we must take steps that can
[5] soften our impact on the earth's environment and
[6] quicken our progress toward a more prosperous
[7] world. And, yet, we must be realistic: Solving
[8] this problem will take time. It has been created
[9] over a period of time. We are now, of course,
[10] accelerating the process by which climate change is
[11] being created, but we have to begin to reverse the
[12] trends that created and problem and, in doing so,
[13] recognize that it will take some time.
[14] If we ignore the scientific warnings and
[15] continue stubbornly on our current course we had
[16] better begin to prepare what we would like to say
[17] to our children and grandchildren. Because if they
[18] encounter the terrible consequences the scientific
[19] community is saying now come as a result of global
[20] climate disruption, and then look back at the
[21] evidence that was clearly laid out for us and our
[22] generation they might fairly ask, if you knew all

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[1] that why didn't you do something about it?
[2] Well, I don't want to hear that question
[3] years from now and we can prevent this by taking
[4] the right steps now.
[5] Because solving global climate disruption
[6] is not only an environmental imperative, it is also
[7] an economic imperative. We understand that if we
[8] approach the global climate change problem in the
[9] wrong way we could hinder economic growth. We
[10] will not do that. We want sustainable growth and
[11] the kind of progress that can result from
[12] approaching the problem in the right way. That
[13] means taking concrete steps that reduce emissions
[14] without jolting the economy.
[15] We will hear today about some different
[16] options and ideas and I am confident that working
[17] together we can find a sensible approach. One of
[18] the answers will involve new technologies. Already
[19] we are developing and accelerating the use of clean
[20] energy. We have a Partnership for a New Generation
[21] of Vehicles, for example, that will triple the
[22] efficiency of today's cars while preserving their

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[1] current performance, comfort and safety.
[2] We are working to produce low-cost
[3] transportation fuels using new energy crops. We
[4] are working with the building industry to build
[5] structures that are 50 percent more energy
[6] efficient. And, of course, an important part of
[7] the longer term answer lies in the more rapid
[8] development of low-carbon energy sources such as
[9] solar, wind, biomass, hydrogen and fusion.
[10] While these new fuels may, in some
[11] instances, sound like they are far-off, some are
[12] nearly cost-effective today and all offer
[13] tremendous promise for tomorrow.
[14] To make these new technologies a reality
[15] for our children requires that we make the right
[16] kinds of investments today.
[17] Welcome, then, to the White House
[18] Conference on Climate Change. Our purpose is
[19] clear: We are facing a global threat that demands
[20] a global response. And while no one country can
[21] solve the problem on its own, no coalition of
[22] countries can solve the problem without the active

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[1] participation and leadership of this country.
[2] So, let us launch the great resources of a
[3] great country on behalf of the children of our
[4] nation and the world. Let us summon America's
[5] scientific genius, economic might, commercial
[6] ingenuity and history of leading large coalitions
[7] against threats to our common future.
[8] Now is the time to cut back emissions,
[9] design 21st Century solutions, and begin the steps
[10] necessary to return our planet to the stable
[11] climate balance that has been enjoyed by our
[12] ancestors throughout the entire history of
[13] civilization, to preserve the future of life as we
[14] know it and as we would like our children to know
[15] it.
[16] To all of you, thank you for your
[17] participation, and welcome and, please, participate
[18] actively throughout the day.
[19] Now, it is my great pleasure and honor to
[20] introduce a friend, someone who stands up and
[21] provides leadership when it is most needed; a
[22] person whose own optimism, inventiveness and

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[1] exuberance has helped to give us an expansive and
 [2] accurate view of America's options and
 [3] possibilities; a man committed to a surging
 [4] economy, a stable climate and a healthy environment
 [5] and a bright future for all of our people,
 [6] President William Jefferson Clinton.
 [7] [Applause.]
 [8] PRESIDENT CLINTON Thank you. Thank you
 [9] very much.
 [10] Thank you, Mr. Vice President, for your
 [11] remarks and your remarkable leadership to help us
 [12] keep our earth in the balance.
 [13] Thank you, Father O'Donovan, for letting
 [14] me come home to Georgetown one more time to discuss
 [15] a matter of immense importance to America and its
 [16] future.
 [17] I thank the members of Congress and the
 [18] members of Cabinet and the administration who are
 [19] here, all those who have agreed to serve on the
 [20] panels, and all of you who have come to be a part
 [21] of this important day.
 [22] Six years ago last Friday--I can hardly

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[1] believe it, but it was six years ago last Friday
 [2] that I announced my intention to run for President,
 [3] challenging America to embrace and to vigorously
 [4] pursue a vision of our country for the 21st century
 [5] to make the American dream alive for every person
 [6] responsible enough to work for it, to keep our
 [7] country, the world's strongest force, for peace and
 [8] freedom and prosperity, to bring our people
 [9] together across all the lines that divide us into
 [10] one America.
 [11] Shortly afterward, I came here to
 [12] Georgetown to this great hall to outline specific
 [13] strategies and new policies, to achieve that
 [14] vision, rooted in our values of opportunity and
 [15] responsibility, faith and family and community,
 [16] designed to help Americans seize the opportunities
 [17] and solve the problems of this new age.
 [18] It was clear to me that our new direction
 [19] had to be rooted in some basic guidepost, that we
 [20] had to be oriented toward the future, not the past,
 [21] toward change, not the status quo, toward
 [22] partnership, not division, toward giving all a

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[1] chance, not just a few, and finally toward making
 [2] sure America leads, not follows.
 [3] We tried to develop a new approach to
 [4] Government where we didn't claim to do everything
 [5] and we wouldn't tolerate doing nothing, but
 [6] instead, we focused on giving people the tools to
 [7] make the most of their own lives and creating the
 [8] conditions that would allow them to succeed, and we
 [9] had new policies, economic policies and trade
 [10] policies, education policy, crime and welfare,
 [11] policies toward the working poor, policies to
 [12] bolster families and help them balance work and
 [13] child-rearing, policies in health care and foreign
 [14] policy, and, yes, policies in the environment.
 [15] In the last four years and eight months, I
 [16] think it is fair to say that together we have made
 [17] real progress toward that vision of the 21st
 [18] century. We stand at the threshold of that century
 [19] stronger than most people thought was possible back
 [20] in 1991. With our economy thriving, our social
 [21] fabric mending, our leadership in the world strong,
 [22] we have a solid foundation of achievement on which

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[1] to stand as we take on the remaining challenges to
 [2] build that bridge to the 21st century.
 [3] We are back here at Georgetown today
 [4] because global climate change clearly is one of the
 [5] most important of those challenges, and also one of
 [6] the most complex, crossing the disciplines of
 [7] environmental science, economics, technology,
 [8] business, politics, international development, and
 [9] global diplomacy, affecting how we and all others
 [10] on this planet will live, support our families,
 [11] grow our food, produce our energy and realize our
 [12] dreams in the new century. That is why we put
 [13] together this White House Conference on Climate
 [14] Change, bringing together experts and leaders with
 [15] a wide range of knowledge and a wide range of
 [16] views.
 [17] People of goodwill bring to this
 [18] conference many honest disagreements about the
 [19] nature of the threat we face and how we should
 [20] respond. That is healthy in a democracy like ours.
 [21] My hope is that we will take advantage of this
 [22] forum to actually talk with each other, rather than

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[1] past each other, for it is our responsibility to
 [2] work together to achieve two vital and compatible
 [3] goals, ensuring the continued vitality of our
 [4] planet and expanding economic growth and
 [5] opportunity for our people.
 [6] Despite the complexities of these
 [7] challenges, we have good reason to be optimistic,
 [8] beginning with our 220-year record of making all
 [9] manner of difficult problems solvable, and
 [10] importantly, a very good record in the last
 [11] generation of environmental progress. In the last
 [12] generation alone, we came together to heed Rachel
 [13] Carson's warnings, and ban DDT and other poisons.
 [14] We cleaned up rivers so filthy, they were catching
 [15] on fire, phased out lead in gasoline and chemicals
 [16] that were eating a hole in the ozone layer. We
 [17] have worked with citizens to conserve the
 [18] Headwaters Forest of Northern California, restore
 [19] the Florida Everglades, protect Yellowstone
 [20] National Park from the assaults of mining, in each
 [21] case proving that environmental stewardship does
 [22] not have to hamstring economic growth.

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[1] Indeed, in tackling the difficult task of
 [2] cutting sulfur dioxide emissions with an innovative
 [3] system of permit trading, the United States is well
 [4] ahead of the schedule we set for ourselves and well
 [5] below the projected cost in cleaning the
 [6] environment. I believe we can find that same
 [7] common ground as we address the challenge of
 [8] climate change.
 [9] Before we begin our discussion today, I
 [10] think it is important for me to explain the four
 [11] principles that will guide my approach to this
 [12] issue.
 [13] First, I am convinced that the science of
 [14] climate change is real. We will hear more about
 [15] this today from our first panel, but for me, the
 [16] bottom line is that although we do not know
 [17] everything, what we do know is more than enough to
 [18] warrant responsible action.
 [19] A great majority of the world's climate
 [20] scientists have concluded if we don't cut our
 [21] emission of greenhouse gases, temperatures will
 [22] rise and will disrupt the global climate. In fact,

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(1) most scientists say this process has already begun.
(2) I might add that I had nothing to do with
(3) scheduling this conference on the day which is
(4) predicted to be the hottest October the 6th that we
(5) have ever had in Washington, D.C.

(6) [Laughter.]

(7) PRESIDENT CLINTON: I know not everyone
(8) agrees on how to interpret the scientific
(9) conclusions. I know not everyone shares my
(10) assessment of the risks, but I think we all have to
(11) agree that the potential for serious climate
(12) disruption is real. It would clearly be a grave
(13) mistake to bury our heads in the sand and pretend
(14) the issue will go away.

(15) The second principle is that when the
(16) nations of the world meet in December in Kyoto,
(17) Japan, we must be prepared to commit to realistic
(18) and binding goals on our emissions of greenhouse
(19) gases. With 4 percent of the world's population,
(20) we enjoy more than 20 percent of the world's
(21) wealth, which helps to explain why we also produce
(22) more than 20 percent of the world's greenhouse

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(1) gases. If we expect other nations to act on the
(2) problem, we must show leadership.

(3) The third principle is that we must
(4) embrace solutions that will allow us to continue to
(5) grow our economy as we honor our global
(6) responsibilities and our responsibilities to our
(7) children. We have worked far too hard to
(8) revitalize the American dream to jeopardize our
(9) progress now. Therefore, we must emphasize
(10) flexible market-based approaches. We must work
(11) with business and industry to find the right ways
(12) to reduce greenhouse gas emissions. We must
(13) promote technologies that make energy production
(14) and consumption more efficient.

(15) There are many people here today from
(16) companies that are addressing the climate change in
(17) innovative ways, taking steps that will save money
(18) for American families even as we reduce the threat
(19) of global warming.

(20) For example, a number of leading electric
(21) utilities, including AEP, Southern Company, Niagara
(22) Mohawk, and Norther States Power, are working with

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(1) homeowners to promote a new technology called
(2) geo-exchange, using geothermal pumps to heat and
(3) cool homes far more cheaply than traditional
(4) systems, while reducing greenhouse gas emissions by
(5) 40 percent or more.

(6) Ballard Power and United Technologies are
(7) leading pioneers in developing fuel cells that are
(8) so clean, their only exhaust is distilled water.

(9) Right now Ballard is working with
(10) Chrysler, Mercedes-Benz and Toyota to introduce
(11) fuel cells into new cars. Both of these
(12) technologies represent the kind of creative
(13) solutions that will make our job much easier.

(14) The fourth principle is that we must
(15) expect all nations, both industrialized and
(16) developing, to participate in this process in a way
(17) that is fair to all. It is encouraging that so
(18) many nations in so many parts of the world are
(19) developing so rapidly. That is good news for their
(20) people, and it is good for America's economic
(21) future, but as we have seen right here at home,
(22) rising energy demands that accompany economic

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(1) development traditionally have meant large
(2) increases in greenhouse gas emissions.

(3) In fact, if current trends continue,
(4) emissions from the developing world will likely
(5) eclipse those from the developed world in the next
(6) few decades, but they have an opportunity to pursue
(7) a different future without sacrificing economic
(8) growth.

(9) The industrialized world alone cannot
(10) assume responsibility for reducing emissions.
(11) Otherwise, we will wind up with no reduction in
(12) emissions within a matter of a few decades. In
(13) Kyoto, therefore, we will ask for meaningful, but
(14) equitable commitments from all nations.

(15) Second, we must explore new ways for
(16) American businesses to help these rapidly growing
(17) countries to meet their developmental needs with
(18) cleaner and more efficient energy technologies.

(19) Today, I hope we can take a step forward
(20) in putting all four of these principles into
(21) effect. We have studied this issue long enough to
(22) know that there are sensible options for action.

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(1) It is our job now to pull them together into a
(2) coherent plan.

(3) Nearly three decades ago when the Apollo
(4) astronauts first went to the moon, we gained an
(5) entirely new perspective on the global challenge we
(6) face today. For looking down on earth from the
(7) vantage point that revealed no political boundaries
(8) or divisions, the astronauts had the same chilling
(9) sensation. They were simply awestruck by how tiny
(10) and fragile our planet is, protected from the harsh
(11) void of space by an atmosphere that looked as thin
(12) and delicate as the skin of an onion.

(13) Every astronaut since has experienced the
(14) same insight, and they have even given it a name,
(15) "the overview effect." It is instilled in each new
(16) astronaut a passion to convince people we must work
(17) together on earth's behalf.

(18) Rusty Swikert has said, "You realize that
(19) on that little blue-and-white thing, there is
(20) everything that means anything to you, all history
(21) and music and poetry and art and death and birth
(22) and love, all of it on that little spot out there

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(1) you can cover with your thumb."

(2) To the best of my knowledge, only one
(3) person here has actually experienced the overview
(4) effect firsthand, Dr. Mae Jemison, a former Shuttle
(5) astronaut and current international development
(6) expert who will participate in our third panel
(7) discussion this afternoon. Nonetheless, I
(8) challenge everyone in this room to rise to a
(9) vantage point high enough to experience the
(10) overview effect. It will enable us to reach common
(11) ground.

(12) Let me say when the Vice President was
(13) talking and Father O'Donovan was talking, I was
(14) looking around this old hall that I have loved for
(15) so long, and I found it utterly amazing that I
(16) first came here 33 years ago.

(17) I was reading this morning up at Camp
(18) David the list of people who were going to be here
(19) today, and I found it utterly amazing that a few of
(20) you, I first talked to as long as 20 years ago
(21) about the need to build an alternative energy
(22) future for America. And I found it completely

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[1] amazing that five-eighths of my Presidency is
[2] behind me.
[3] I make these points for this reason. If
[4] you think about the benchmarks in your own life, it
[5] does not take long to live your life, and what
[6] seems at the beginning of your life a very long
[7] time, seems to have passed in the flash of an eye
[8] once you have experienced it.
[9] These great developments, such as the one
[10] we are here to talk about today, occur over many
[11] life spans, and popular democracies are far more
[12] well organized to take advantage of opportunities
[13] or deal with immediate crises than they are to do
[14] the responsible thing which is to take a moderate,
[15] but disciplined approach far enough in advance of a
[16] train coming down the track to avoid leaving our
[17] children and our grandchildren with a catastrophe.
[18] So I ask you to think about that. We do
[19] not want the young people who sat on these steps
[20] today, for whom 33 years will also pass in the
[21] flash of an eye, to have to be burdened or to
[22] burden their children with our failure to act.

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[1] Thank you.
[2] [Applause.]
[3] VICE PRESIDENT GORE: Mr. President, while
[4] they're removing the podium, I'm going to go ahead
[5] and begin the introduction of this panel. It gives
[6] me great pleasure to introduce some very
[7] distinguished individuals who are members of our
[8] first panel.
[9] Dr. John Holdren, a professor of
[10] Environmental Science and Public Policy at Harvard
[11] University, is also a member of the President's
[12] Committee of Advisors on Science and Technology,
[13] and chair of the Task Force on U.S. Energy Research
[14] and Development Needs in the 21st Century.
[15] Tom Karl is a senior scientist at the
[16] National Oceanographic and Atmospheric
[17] Administration and has recently done some path-breaking
[18] work
[19] that he will present here.
[20] Dr. Diana Liverman is a professor at the
[21] University of Arizona and the chair of the National
[22] Academy of Sciences Committee on the Human
Dimensions of Climate Change.

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[1] Dr. Don Wilhite, the director of the
[2] National Drought Mitigation Center, is a
[3] climatologist at the University of Nebraska, in
[4] Lincoln.
[5] And Dr. Robert Watson, the director of
[6] Environment for The World Bank, is also head of the
[7] Intergovernmental Panel on Climate Change.
[8] I think that we're going to start with Dr.
[9] John Holdren, and then move from there.
[10] DR. HOLDREN: Thank you very much, Mr.
[11] President, Mr. Vice President, as you know, there
[12] is a growing scientific consensus on three critical
[13] points about global climate change. The first
[14] point is that the climate is changing in ways that
[15] are not explainable by natural causes.
[16] The second point is that emissions of
[17] greenhouse gases from human activities, above all,
[18] from fossil fuel burning and from deforestation are
[19] the main causes of those changes.
[20] And the third point is that the
[21] consequences of those changes in climate in the
[22] next century are likely to include significant

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[1] disruption of human health and well-being over
[2] substantial parts of this planet.
[3] In talking about the key elements of this
[4] scientific consensus this morning, I'm going to
[5] rely rather heavily on the findings of the
[6] Intergovernmental Panel on Climate Change which has
[7] been mentioned a couple times, here, this morning.
[8] It's the international body that has drawn on the
[9] expertise of some 2,000 of the world's leading
[10] analysts of these matters to develop authoritative
[11] assessments to serve as the basis for decision
[12] making by policy makers and governments about how
[13] to react to this problem.
[14] Dr. Bob Watson, who, as the Vice President
[15] just mentioned, is the head of the IPCC, will say a
[16] little more about it later this morning.
[17] The problem we're dealing with, of course,
[18] is the problem that is popularly called global
[19] warming because it does entail raising the average
[20] temperature of the Earth's surface.
[21] It also entails a lot more than that, as
[22] we're going to talk about, but the place to start

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[1] in discussing it is with why the Earth's
[2] temperature is what it is.
[3] It turns out that just a few gases, which
[4] are naturally present in the Earth's atmosphere in
[5] quite small concentrations are responsible for
[6] keeping the surface of the Earth about 60 degrees
[7] Fahrenheit warmer than it would otherwise be.
[8] They're called greenhouse gases because they work
[9] in a way analogous to one of the functions of glass
[10] in a greenhouse; namely, they let incoming sunlight
[11] through but they trap some of the outgoing heat and
[12] send it back toward the ground.
[13] The largest contributors to that natural
[14] greenhouse effect are water vapor, carbon dioxide,
[15] methane, and nitrous oxide. And without those
[16] trace greenhouse gases in the atmosphere, the Earth
[17] would in fact be too cold for life as we know it.
[18] The problem we're talking about here is
[19] that for hundreds of years human activities have
[20] been adding greenhouse gases to the atmosphere,
[21] mainly, at first, carbon dioxide from
[22] deforestation. Later, carbon dioxide from fossil

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[1] fuel burning, methane, and nitrous oxide from land
[2] use changes, and finally, chlorofluorocarbons and
[3] their relatives from a variety of industrial
[4] processes, all of them greenhouse gases.
[5] And in the last century, in particular,
[6] the huge growth of fossil fuel use as a result of
[7] industrialization has been the main factor, the
[8] main driver in lifting the carbon dioxide content
[9] of the atmosphere to about 30 percent above its
[10] pre-industrial value.
[11] The concentrations of the other greenhouse
[12] gases have also been growing in this period. On
[13] the other hand, the atmospheric concentrations of
[14] particles put there by human activities have also
[15] been increasing.
[16] Those extra particles in the atmosphere
[17] screen out some sunlight. They help form clouds
[18] that screen out even more, and so they've partly
[19] offset the warming effect of the greenhouse gas
[20] additions. But all in all, the net manmade
[21] addition to the greenhouse effect, from all of the
[22] greenhouse gases combined, minus the effect of the

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[1] particles, is about what it would be from the
[2] carbon dioxide additions alone.
[3] And that's enough to cause changes in
[4] climate that have started to become measurable, and
[5] that threaten to grow in the future to levels that
[6] are highly disruptive of human well-being.
[7] Now, up until now, the industrialized
[8] countries have accounted for most of the human
[9] additions of greenhouse gases to the atmosphere.
[10] The United States, with about 4 percent of the
[11] world's population, has been responsible for more
[12] than 25 percent of the emissions of greenhouse
[13] gases into the atmosphere over the last 45 years.
[14] The less developed countries altogether,
[15] with about 80 percent of the population, have been
[16] responsible for less than 25 percent, that is less
[17] than the United States alone, of the greenhouse gas
[18] emissions into the atmosphere over that period.
[19] Their per capita emissions are typically
[20] 1/10th or less the per capita emissions of carbon
[21] dioxide in the industrialized nations like the
[22] United States.

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[1] But 90 percent of the world's population
[2] growth over the next several decades is expected to
[3] occur in the less developed countries, and much of
[4] the economic growth over that period is expected to
[5] grow there, too, and that means that their
[6] greenhouse gas emissions, along with the fossil
[7] fuel use that they plan to use to drive much of
[8] that economic growth are going to go up.
[9] In fact over the next century, under
[10] business as usual, we would expect the emissions
[11] from the less developed countries to pass those of
[12] the industrial nations around 2030 or 2035, as this
[13] particular graphic shows. Although it is important
[14] to note that their per capita emissions at the time
[15] they pass us will still be only about 1/6th of
[16] ours, and that it will take a considerable time
[17] thereafter before their cumulative contributions to
[18] the atmospheric build-up of these gases equal ours.
[19] Now, over the last 100 years, while
[20] atmosphere carbon dioxide has been increasing, so
[21] has the Earth's temperature. The mean global air
[22] surface temperature on the planet has increased by

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[1] about one degree Fahrenheit over this period.
[2] The surface temperature, this century, is
[3] as warm or warmer than in any century since 1400,
[4] and the last two decades of this century have been
[5] the warmest ones in the century. Eleven of the
[6] hottest years in the last 100 years have occurred
[7] since 1980, and 1995 was the hottest single year on
[8] record.
[9] Those temperature changes have been
[10] greater at high latitudes than near the equator.
[11] Ocean surface temperatures have increased along
[12] with air temperatures over land. Day/night
[13] temperature differences have shrunk, and the way
[14] temperature varies with height in the atmosphere
[15] has also changed in this period.
[16] And the point about all of this is that
[17] all of these observed changes are consistent with
[18] what basic climate science predicts will result
[19] from increasing greenhouse gas concentrations, and
[20] they are consistent also with the numerical results
[21] of the best computer models of global climate, when
[22] those are run with the observed increase in

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[1] greenhouse gas concentrations, with the increases
[2] in atmospheric particulate matter, and with the
[3] estimated variations in the output of the sun.
[4] Now to help think about where this
[5] situation is headed in the future, the IPCC has
[6] developed a set of scenarios for emissions of
[7] greenhouse gases for atmospheric concentrations and
[8] for the likely associated temperature changes
[9] extending over the next century, out to the year
[10] 2100. These are shown on the current graphic.
[11] The carbon dioxide concentrations on the
[12] top, the temperatures likely to be associated with
[13] that on the bottom, and the lines through the
[14] middle of that are the so-called business as usual
[15] energy future, where we're headed if we don't
[16] change very much from what we're doing now.
[17] Where that is, where that business as
[18] usual is taking us is toward atmospheric
[19] concentrations of carbon dioxide near 700 parts per
[20] million of carbon dioxide by the year 2100. That's
[21] about two and a half times the pre-industrial
[22] concentration of carbon dioxide.

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[1] The accompanying further temperature
[2] changes beyond what has already occurred are
[3] estimated to be between 2 and 6 degrees Fahrenheit,
[4] associated with that carbon dioxide change. And as
[5] I mentioned before, those temperature increases
[6] would not be uniform because higher latitudes will
[7] warm more than the equatorial regions. The United
[8] States would face a warming in 2100, and after, of
[9] 5 to 10 degrees Fahrenheit, on the average.
[10] Now, let me put this in perspective by
[11] showing one of the Vice President's favorite
[12] graphics, which shows carbon dioxide and
[13] temperature changes over the last 160,000 years,
[14] based on analysis of air bubbles trapped in ice
[15] cores in the Antarctic ice.
[16] What you see when you look at this picture
[17] is that today's atmospheric carbon dioxide
[18] concentrations are already well outside the range
[19] of natural variations that occurred over the
[20] preceding 160,000 years, and by 2100, under
[21] business as usual, we'll reach carbon dioxide
[22] concentrations that haven't been seen on this

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[1] planet in the last 50 million years.
[2] We'll be heading in the business as usual
[3] scenario toward a tripling of the pre-industrial
[4] concentrations of carbon dioxide, and we will have
[5] achieved that in the geological blink of an eye,
[6] exposing, as we do it, natural systems to a rate of
[7] temperature change faster than at any time in the
[8] last 10,000 years.
[9] But of course it's not just the change in
[10] temperature that we're worried about. That
[11] temperature change is, in a way, just an indicator
[12] of a whole array of changes in the conditions that
[13] make up the climate. The patterns of hot and cold,
[14] of wet and dry, of winds and ocean currents, which,
[15] in turn, affect ecological systems and human well-being in a
[16] hundred different ways.
[17] Particularly important in that is that
[18] global warming causes the planet's cycle of
[19] evaporation and precipitation, the so-called
[20] hydrologic cycle, to speed up. More heat means
[21] more evaporation, which means more water going into
[22] the atmosphere, and therefore, more water coming

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[1] out as rain and snow.
[2] But the greater evaporation, an earlier
[3] snow melt that go with warming, can also mean,
[4] almost paradoxically, reduced soil moisture and
[5] less water availability in the growing season in
[6] regions where that's already a problem.
[7] Warming will also cause sea level to rise,
[8] mostly from the thermal expansion of ocean water,
[9] but some from melting of the Antarctic and
[10] Greenland ice sheets, and from mountain glaciers,
[11] and that melting process, by the way, is expected
[12] to continue for centuries, even after the
[13] atmospheric concentration of carbon dioxide
[14] stabilizes.
[15] Now sea level has increased from 4 to 10
[16] inches in the last 100 years. It's expected to
[17] increase by another 6 to 40 inches in the next 100
[18] years. The uncertainty in that amount is large.
[19] But it should be clear that near the upper end of
[20] the range, the damage would be immense.
[21] The map that's on the screen shows that a
[22] sea level rise of one meter, 39 inches, would

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[1] inundate the whole southern tip of Florida, with it
[2] all of the Everglades. Of course a number of low
[3] lying island nations would disappear altogether
[4] under these circumstances.
[5] It's just clear that these kinds of
[6] changes in climate could in fact damage human well-being in
[7] a very wide variety of ways. Increased
[8] deaths from heat stress on hot summer days and
[9] nights could be expected, along with even bigger
[10] impacts on human health from expanded geographic
[11] range of vector borne diseases like malaria and
[12] yellow fever.
[13] Many regions would experience more
[14] frequent and more damaging floods and drought.
[15] With large efforts to adapt agriculture, world food
[16] production might be maintained overall, but
[17] reductions in parts of the tropics and subtropics,
[18] where food production is already inadequate, are
[19] likely.
[20] The impacts are also likely to include
[21] increased damage to coastal property by storms as a
[22] result of the increase in sea level, as well as the

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[1] inundation of low lying wetlands like the
[2] Everglades.
[3] And shifts in the ecological life zones,
[4] that determine at what latitudes and altitudes
[5] different kinds of plants can flourish are going to
[6] affect forestry and tourism in a great many
[7] different places.
[8] You'll hear more about all of these
[9] impacts, shortly, from Drs. Karl, Liverman, and
[10] Wilhite.
[11] Now it's important to point out that most
[12] of the studies of these potential impacts of global
[13] warming are focused for purposes of comparability
[14] on the consequences just of doubling the pre-industrial
[15] concentrations of carbon dioxide.
[16] But as we've already seen, anything like
[17] business as usual and we're not going to stop at a
[18] doubling. Quite possibly the concentration will go
[19] to triple or even quadruple the pre-industrial
[20] levels. To help decide whether to take action to
[21] get off of that business as usual emissions path,
[22] scientists need to look more carefully, and

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[1] citizens and policy makers need to think more about
[2] the impacts that would be likely at those higher
[3] concentrations.
[4] In this spirit, I want to close by showing
[5] you two computer model projections of the evolution
[6] of temperature over the next few centuries under
[7] twofold and fourfold increases in the pre-industrial carbon
[8] dioxide concentration.
[9] The first one that's being shown now is
[10] for a doubled carbon dioxide concentration. The
[11] greenish colors denote increases of less than 5
[12] degrees Fahrenheit. The yellow colors from 5 to 10
[13] degrees Fahrenheit. The oranges and reds from 10
[14] to 20 degrees Fahrenheit.
[15] You can see in the picture how the warming
[16] is greatest at the high latitudes, but the whole
[17] United States is in the 5 to 10 degree increase
[18] range in this doubling scenario.
[19] Now the next clip, which is showing now,
[20] is of a world with four times the pre-industrial
[21] carbon dioxide level. Now the whole globe is
[22] getting yellow and orange, with increases of more

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[1] than 15 degrees Fahrenheit over most of the United
[2] States, and a new brown color that denotes
[3] increases of more than 25 degrees Fahrenheit
[4] showing up over the Arctic.
[5] Soil moisture deficits in the growing
[6] season would be in the range of 30 to 50 percent
[7] for this fourfold CO2 increase, compared to 10 to
[8] 30 percent in the doubled CO2 case.
[9] Now Mr. President, Mr. Vice President, I
[10] submit that avoiding climate changes of this
[11] magnitude is clearly in our national interest.
[12] [Applause.]
[13] VICE PRESIDENT GORE: Before calling on
[14] Tom Karl, let me just ask one brief question.
[15] You talked about the figure of 700 parts
[16] per million in CO2 concentrations. A doubling of
[17] the pre-industrial level would be 550. Correct?
[18] DR. HOLDREN: That would be 550, and we're
[19] going to talk more about that as the morning goes
[20] on.
[21] VICE PRESIDENT GORE: Well, somebody said
[22] that under the current projections it will reach

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[1] 550 between 2040 and 2060. Is that correct?
[2] DR. HOLDREN: We'll show all those curves.
[3] VICE PRESIDENT GORE: Okay; all right.
[4] all right.
[5] DR. HOLDREN: That's the ball park, where
[6] we're headed under business as usual. Absolutely.
[7] VICE PRESIDENT GORE: All right.
[8] Well, the reason I asked that is, you
[9] know, I've got a different category of things, for
[10] things that happen in what I hope will be my
[11] lifetime, and--in any event--
[12] [Laughter.]
[13] VICE PRESIDENT GORE: Tom Karl. Tom Karl
[14] is senior scientist with NOAA and has studied
[15] precipitation patterns worldwide. What evidence is
[16] there that changes are taking place, Dr. Karl?
[17] DR. KARL: Thank you, Mr. Vice President.
[18] We've prepared a number of charts to help
[19] guide us in our explanation of these changes. On
[20] the first chart we see what's happened to
[21] precipitation over the course of the 20th Century
[22] across much of the globe, and in this particular

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[1] chart you see a number of different colored dots.
[2] The blue dots represent increases of
[3] precipitation and the yellow dots or orange dots
[4] reflect decreases of precipitation. And what
[5] you'll notice is a pattern of change where the mid
[6] and high latitudes have increased their
[7] precipitation, and the subtropics and tropics have
[8] actually decreased their precipitation.
[9] Now the size of these changes are up to
[10] and exceeding 50 percent, that is, 50 percent more
[11] precipitation now falls in the mid and high
[12] latitudes than did earlier in the century.
[13] Seasonally, we're finding more
[14] precipitation occurring in mid and high latitudes
[15] in the cold part of the year.
[16] Now, what does this mean? Actually, in
[17] terms of snow, we actually find that snow in the
[18] high latitudes, where it's already cold enough to
[19] snow, is also increasing, despite the fact that
[20] temperatures have warmed.
[21] Now, all these changes are consistent with
[22] model projections that we anticipate to occur with

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[1] increased global temperatures.
[2] Now, the changes that we've already seen
[3] have already produced a number of important
[4] impacts, and I'll just highlight a few for you.
[5] For example, in 1996, China experienced
[6] some devastating floods. 20 million people were
[7] affected. 2 million people were homeless. Costs
[8] were estimated to exceed \$20 billion. Just in the
[9] past five years, in Europe, we've had a number of
[10] catastrophic floods. Five catastrophic floods in
[11] the last five years.
[12] And of course, here, in North America, few
[13] of us can forget the Mississippi-I'm sorry-the
[14] floods in the Northern Plains, the Ohio River
[15] Valley floods, the flood we experienced in the
[16] Pacific Northwest.
[17] Now, worldwide, in the last two decades
[18] we've had ten times the number of catastrophic
[19] floods than we had the previous two decades. So
[20] clearly, these changes we're seeing are having an
[21] impact, and if we bring it a little closer to home,
[22] we have another chart similar to this DOT chart for

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[1] the globe, showing changes of precipitation that
[2] have occurred in the U.S.
[3] And on average, we've had a 5 to 10
[4] percent increase in precipitation over the course
[5] of the 20th Century. But this is significantly
[6] greater in some areas because the increase has not
[7] been uniform. Actually, there are some areas that
[8] have a small decrease.
[9] Now, this 5 to 10 percent increase in
[10] precipitation may not seem like much, but that's
[11] equivalent to about the annual discharge of water
[12] out of the mouth of the Mississippi River every;
[13] year. That's a lot of water.
[14] And again, these have had important
[15] impacts. In the 1980's, we had record levels along
[16] the Great Lakes. The Great Salt Lake exceeded its
[17] bank in the 1980's. The 1990's, in addition to the
[18] events just mentioned a minute ago, we had the
[19] Mississippi River Valley floods. In October of
[20] '94, Texas was inundated by flood waters.
[21] California, in the winter of '95, again a
[22] tremendous number of flooding had taken place.

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[1] But this is really only half the story.
[2] On the next viewgraph we try and articulate our
[3] understanding of what happens when we have this
[4] excess energy at the surface of the Earth because
[5] of the greenhouse effect.
[6] That excess energy can do two things.
[7] One, it can go to raise the temperature, but in
[8] fact only about 20 percent of that additional
[9] energy goes into raising the surface temperature.
[10] The other 80 percent goes into evaporating water
[11] from the surface.
[12] This then provides more water vapor into
[13] the atmosphere and this water vapor is what storms
[14] feed on. That's where we end up getting these very
[15] heavy and intense precipitation events, and in fact
[16] storms actually become more intense when there's
[17] ample water available to release the heat to
[18] provide the fuel for them.
[19] Now, we've prepared another viewgraph to
[20] show you what's happening to intense precipitation
[21] events in the U.S.
[22] This particular graph shows that that 5 to

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[1] 10 percent increase in precipitation we talked
[2] about has been disproportionate in a sense that
[3] most of that increase is coming from the very heavy
[4] and extreme precipitation events, those events that
[5] give us these inundating rains in 24 hours.
[6] If we look at the more moderate and light
[7] events, we see little or no change. Those are the
[8] types of events that we often think of as being
[9] fairly beneficial.
[10] Now, actually, storms, when we look at the
[11] intensity of storms in the North Pacific and North
[12] Atlantic in the last two decades, we do see an
[13] increase in storm intensity as well, consistent
[14] with that viewgraph we showed you previously.
[15] So, by and large, there's ample evidence
[16] for significant climate changes just in the past
[17] century, and particularly the last couple of
[18] decades.
[19] [Applause.]
[20] PRESIDENT CLINTON: Dr. Liverman, I wonder
[21] if you would like to say a little more about how
[22] climate change is now, or is likely to affect

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[1] average Americans.
[2] DR. LIVERMAN: Well, it's still quite
[3] difficult to say exactly what's going to happen at
[4] the regional level, because particularly the
[5] patterns of how rainfall will change are still a
[6] little uncertain. But we know from some of the
[7] information that John Holdren and Tom Karl have
[8] given us, that temperatures are increasing and are
[9] likely to increase.
[10] So what I'd like to do is to talk
[11] particularly about how that temperature change
[12] might affect ecosystems and human health, and then
[13] I think Don Wilhite will talk more about
[14] agriculture and water resources.
[15] Now, as most of us know the distribution
[16] of plants and animals is largely controlled by
[17] climate. In Alaska, for example, the cold, dry
[18] climate gives the tundra upon which the large
[19] caribou herds graze.
[20] In Florida, the warm, wet climate gives us
[21] tropical trees and tropical birds.
[22] In Arizona, where I live, the warm, dry

[1] climate gives us the saguaros that we love to
[2] visit.
[3] The increasing temperatures that we're
[4] likely to see with climate change are going to
[5] cause species in the United States to move
[6] northwards and to move upwards in elevation.
[7] Let's take the example of the sugar
[8] maples, and I have a couple of graphics here to
[9] illustrate it. The sugar maples give us those
[10] beautiful fall colors that bring millions of
[11] tourists to New England, and of course that
[12] breakfast pleasure, maple syrup.
[13] Now, some of the studies that have been
[14] done on how sugar maple distributions may change,
[15] based on historical pollen analysis, suggests that
[16] the sugar maples, as a result of climate change,
[17] could move north totally out of New England, where
[18] they're so important to tourism and to the regional
[19] economy.
[20] In fact, the sugar maples aren't unique.
[21] About a third of the world's forests could change
[22] as a result of global warming. In the Western

[1] there are other populations who are very
[2] vulnerable, like the elderly and children, who
[3] would be particularly affected by this type of
[4] stress.
[5] Now, the other thing about increased
[6] temperatures is that it's going to exacerbate air
[7] quality problems.
[8] You're going to get higher levels of smog,
[9] and there are certain diseases, respiratory
[10] diseases, asthma, allergies, that could also
[11] increase with higher temperatures.
[12] Here, again, children and the elderly
[13] would be particularly vulnerable.
[14] And then, finally, those of us in the
[15] Southwest are particularly concerned about the
[16] changes in some of these vector borne and water
[17] borne tropical type diseases that John Holdren
[18] talked about.
[19] Now, we've already made ourselves
[20] vulnerable through our irrigation systems that
[21] create breeding sites for mosquitoes. But one of
[22] the things we're particularly concerned about in

[1] U.S., our models show that gambol [ph] oak, pinyon
[2] pine, Douglas fir, and the saguaros could disappear
[3] from large regions of the Southwest.
[4] Now, those trees could move somewhere
[5] else, but the problem is that we've got a lot of
[6] human development out there, we can't tell people,
[7] "Oh, sorry, Saguaro National Park has moved. We
[8] need to move it up into your area." It's very
[9] difficult to do that.
[10] [Laughter.]
[11] I think the Vice President used the term,
[12] and I would like to appropriate it: I don't want to
[13] live next to the park formerly known as Saguaro
[14] National Park.
[15] Another concern of course is that climate
[16] changes much faster than most tree species can
[17] move. Climate changes, if you're going to have a 3
[18] degree temperature increase, that's going to move
[19] many of these boundaries about 300 miles north.
[20] Tree species usually only migrate at about 3 to a
[21] 100 miles per century. So it's going to be hard
[22] for them to keep up with this climate change.

[1] Tucson, and along the border, are possible
[2] increases in diseases like dengue fever, cholera,
[3] and malaria, as shown on this map, which shows the
[4] change in the area that would be subject, or
[5] vulnerable to malaria in a warmer world.
[6] **PRESIDENT CLINTON:** Isn't there some
[7] evidence already that malaria, in nations, in areas
[8] where it presently exists, is becoming more
[9] prevalent and moving to higher climates?
[10] **DR. LIVERMAN:** Yeah, there is some
[11] evidence that, For example, there is more malaria
[12] at higher elevations in some developing countries,
[13] and certainly, there's some more anecdotal evidence
[14] of malaria moving into the United States. That's
[15] partly climate, but it's also because we have a
[16] much more mobile population today than we had in
[17] the past.
[18] **PRESIDENT CLINTON:** Let me ask you one
[19] other question. Let me go back to what I said in
[20] the beginning. This is one of the most difficult
[21] problems of democracy because if we get a 100
[22] percent of the people to agree that it exists, and

[1] The second thing I'd like to talk a bit
[2] about is human health, that's a concern to all of
[3] us, and John Holdren mentioned the problem of heat
[4] stress. I'd like to give you one example. In July
[5] 1995, 465 people died in Chicago when a heat wave
[6] caused 98 degree Fahrenheit temperatures, both day
[7] and night.
[8] Now, today, that happens about once every
[9] 150 years. As we can see in some of these
[10] graphics, this map here that shows how heat stress
[11] would change, under a doubled carbon dioxide world,
[12] that could be six times more frequent.
[13] Now, with the urban temperature increases
[14] you've also got problems with increased air
[15] conditioning costs, and I'm sure that most of you
[16] don't want to pay the sort of air conditioning
[17] bills that we pay in Tucson right now.
[18] Now, there is a flip side to that. We
[19] could reach these energy costs in the northern part
[20] of the United States. But there are many people in
[21] the southern part of the United States who can't
[22] afford the air conditioning, particularly—and

[1] only 10 percent of the people have experienced it,
[2] and another 10 percent of the people can imagine it
[3] and therefore are willing to deal with it, you
[4] still have to have 51 percent in order to develop
[5] any kind of political consensus for doing anything,
[6] I think, commensurate with the need.
[7] So would you say—I had, and I know this
[8] happens to a lot of people—but I had a number of
[9] people, I had a young congressman in to see me the
[10] other day who's a member of the Republican Party.
[11] He said that, "You know, in my state we've had 300
[12] year floods in 10 years."
[13] I met a man over my vacation who said that
[14] he was moving away from the place he had lived for
[15] a decade because it was a completely different
[16] place than it had been just 10 years ago. It was
[17] hotter. There were more mosquitoes. It was a very
[18] different and difficult place.
[19] Do you believe that these anecdotal
[20] experiences are likely related to climate change,
[21] or are they just basically people's imagination?
[22] **DR. LIVERMAN:** No, I actually think

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[1] there's a scientific basis for these perceptions of
[2] climate change. That's actually an area I do some
[3] research in, and you can do—we've done very
[4] carefully structured scientific surveys of farmers
[5] and of city dwellers, that show that many people do
[6] believe that the climate is changing, whether it's
[7] a farmer in Mexico or a resident of Los Angeles.

[8] We have a lot of studies where people do
[9] believe it's changing, and in many cases it
[10] correlates with the type of observed temperature
[11] changes that Tom Karl talks about.

[12] So my feeling, from my own work,
[13] interviewing people, is that many people in this
[14] country do think that the climate is changing and
[15] are concerned about it.

[16] **PRESIDENT CLINTON:** Dr. Karl, you want to
[17] say something?

[18] **DR. KARL:** Yeah. Actually, I think the
[19] anecdotal evidence is consistent with the notion
[20] that although no single event is the basis for
[21] saying global warming's taking place, if you look
[22] at many of them—in fact I have a number of

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[1] statistics you might find of some interest here.

[2] Just during 1996, we had six states that
[3] set their all-time annual precipitation amount.
[4] Not to belabor it, but totals like 16 feet of
[5] rainfall in Oregon during the year 1996. Over 8
[6] feet of precipitation at Mount Mansfield in
[7] Vermont. And there's a number of other records
[8] like this. These are the types of things that
[9] certainly have an impact, and I think people
[10] remember.

[11] **VICE PRESIDENT GORE:** If I could add a
[12] word to this, I noted earlier, James Lee Witt,
[13] who's the head of FEMA, is here. He and I have
[14] gone out, as he and the President have gone out,
[15] frequently, to the sites of these disasters, and
[16] the budget for the consequences of the flooding
[17] events and the other disaster events as well—it
[18] now reaches an average of a billion dollars a week
[19] in the United States.

[20] And you mentioned, Doctor, about malaria.
[21] One scientist was telling us, recently, about a
[22] case of malaria that showed up in Detroit during a

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[1] month when the average temperature was a full 6
[2] degrees warmer than the 30 year average, and while
[3] of course you can't, again, say that's the cause
[4] and that's the effect, the odds of diseases of that
[5] kind, as Secretary Donna Shalala, who's here, has
[6] told us, increase quite dramatically.

[7] The other thing I wanted to ask, just
[8] briefly, is in terms of the effects on human
[9] beings.

[10] The weather forecasters who were at the
[11] White House last week talked about the heat index,
[12] the combination of temperatures and humidity, and
[13] your presentation followed right on Dr. Tom Karl's,
[14] and somebody was saying that the heat index, here,
[15] in Washington, D.C., by the middle of the next
[16] century is predicted to go from—do you know the
[17] numbers, Dr. Karl?

[18] **DR. KARL:** I think it's up to 105 or 110.

[19] I don't know the exact numbers but significant—

[20] **DR. LIVERMAN:** It's under a 100 now, and
[21] it's going to go to about 105, on average, they
[22] think, during the summer months.

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[1] **VICE PRESIDENT GORE:** Well, we'll get some
[2] more on that.

[3] **PRESIDENT CLINTON:** We certainly will.

[4] One reason I believe this is occurring is
[5] that James Lee Witt is the only member of my
[6] Cabinet who is actually disappointed when his
[7] budget goes up, and he's had a lot of
[8] disappointment these last five years.

[9] I'd like to now call on Donald Wilhite to
[10] talk about the relationship—because we've heard
[11] about, increased precipitation—now I'd like to ask
[12] him to talk about drought, and the apparent paradox
[13] in drought patterns and increased precipitation
[14] patterns, and what implications this might have for
[15] American agriculture, which is a terribly important
[16] part of our economy, and we have all been counting
[17] on it being a very important part of our expert
[18] economy for the indefinite future.

[19] **DR. WILHITE:** Thank you, Mr. President,
[20] Mr. Vice President. I was asked to talk a little
[21] bit about the—give the "dry talk" I guess in this
[22] presentation.

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[1] [Laughter.]

[2] Each drought event I think is a vivid
[3] reminder of our nation's continuing vulnerability
[4] to climatic variations. If one can remember the
[5] severe droughts of the late 1980's and the early
[6] 1990's, those resulted in severe economic and
[7] environmental consequences in many parts of the
[8] country.

[9] In 1988, For example, nearly 50 percent of
[10] this nation was affected by severe drought, and
[11] resulted in excesses of \$15 billion in agricultural
[12] losses in this country, a very dramatic number.

[13] In 1996, we had a reoccurrence of drought
[14] in the southwestern United States, and this also
[15] resulted in severe economic and environmental
[16] losses, a higher incidence of forest fires, and so
[17] forth. This also is of concern.

[18] In the State of Texas, alone, impacts were
[19] in excess of \$5 billion.

[20] Now American agriculture, while
[21] technologically advanced, is still subject to the
[22] sensitivity of weather conditions, or the vagaries

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[1] of weather.

[2] The slide that's up on the screen now
[3] shows a dramatic upward trend in corn yields since
[4] 1950 in the United States, but note the deviations
[5] on that trend. Those deviations are largely the
[6] result of variations in climate, or extreme weather
[7] conditions. Most of those are the result of
[8] drought events. Some of those are the result of
[9] excessively wet events which delayed or hampered
[10] spring planting.

[11] Drought also is of high incidence and a
[12] normal part of the climate in virtually all
[13] portions of the country.

[14] This next diagram shows the incidence of
[15] drought in the United States over the last 10
[16] years. So while it's true, we've had maybe an
[17] increase in precipitation, I think it's interesting
[18] to note from this slide which shows the number of
[19] years experiencing moderate, severe, or extreme
[20] drought in the last ten, that while you have a
[21] rather surprisingly large area in the western
[22] United States that shows a high incidence of

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[1] drought, we are also demonstrating the high
[2] incidence of drought in the Great Plain States, in
[3] the Southwest, in the Midwest, and also along the
[4] Eastern coast states.
[5] So drought is clearly a phenomena that
[6] affects all portions of the nation, not just the
[7] western United States.
[8] So that projected increases in
[9] temperature, and a possible accelerated water cycle
[10] that we've been hearing about this morning, may
[11] lead to changes in both the amount and the
[12] seasonable distribution of precipitation which may
[13] alter, then, the incidence of drought events and
[14] also flood events in this country.
[15] So while we don't know precisely what the
[16] regional impacts of climate change may be, as Dr.
[17] Liverman was speaking about a few moments ago, we
[18] do know the impacts associated with these extreme
[19] weather events.
[20] And we also know where our vulnerabilities
[21] are as a result of this, and I think it's prudent
[22] that we sort of assess what our vulnerabilities

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[1] are, and use these as a way to reduce the impacts
[2] of drought events and flood events today that will
[3] help us in the future.
[4] **PRESIDENT CLINTON:** I want to ask a
[5] question and try to make sure that we are all as
[6] clear as we can be based on what is known, about
[7] two apparently contradictory things.
[8] That is, that the total volume of
[9] precipitation has increased virtually everywhere,
[10] and the number and severity of droughts has
[11] increased across the country.
[12] Now, Dr. Karl said earlier that part of
[13] the explanation is that the precipitation we're
[14] getting is coming in bigger bursts. But what I
[15] would like to do is to have somebody offer
[16] basically a line of explanation that everyone in
[17] the audience and hopefully those who will be
[18] following these proceedings can understand.
[19] Why did it happen at the same time that we
[20] had more droughts and more floods? How could we
[21] have more droughts when the aggregate amount of
[22] precipitation on an annual basis was increased?

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[1] And I think it's important that people
[2] kind of get why that happened.
[3] **DR. WILHITE:** Well, I'll take a first shot
[4] at that. First of all, the increased precipitation
[5] amount that Tom Karl was referencing earlier, a lot
[6] of this increased precipitation is coming in the
[7] form of short-term intense precipitation events,
[8] which leads to a very high run-off. So there's not
[9] a lot of moisture that goes into the soil.
[10] Secondly, increasing temperatures tends to
[11] increase evaporation and therefore ,the resulting
[12] impact of that is soil drying.
[13] So you have a combination of these things
[14] going on that help to explain this paradox.
[15] **PRESIDENT CLINTON:** And I think that's
[16] important. When the temperature is warm, they dry
[17] the soil and create the conditions for the floods,
[18] simultaneously?
[19] **DR. WILHITE:** That's correct.
[20] **PRESIDENT CLINTON:** And because these
[21] floods don't wash away the soil, rather than sink
[22] down into the soil, you get very little benefit out

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[1] of them, and farmers lose a lot of top soil.
[2] **DR. WILHITE:** Exactly.
[3] **VICE PRESIDENT GORE:** Well, thank you very
[4] much, and now we'll move to Dr. Robert Watson who
[5] is the chair of the leading international
[6] scientific body on the science of climate change.
[7] Dr. Watson, how do you respond to those who say
[8] this is not a real problem?
[9] **DR. WATSON:** Mr. Vice President, Mr.
[10] President, let me assure you that the large
[11] majority of scientists do believe that global
[12] warming is a serious environmental issue. Over
[13] 2,500 scientists participated in the second
[14] assessment report of the IPCC.
[15] These scientists came from government,
[16] industry, environmental organizations, and
[17] universities, from nearly a 100 countries around
[18] the world.
[19] And indeed, at the second conference of
[20] parties, literally all ministers, except from the
[21] oil-producing countries, argued that the IPCC was
[22] and is the most single comprehensive report on the

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[1] state of knowledge, the science, the technology and
[2] the economics, and it should be used as the basis
[3] for international negotiations in Kyoto this year.
[4] But let me be clear. There are
[5] uncertainties in our science. We don't know all
[6] the real facts. But these skeptics are in a clear
[7] minority. The vast majority of scientists do
[8] believe, in spite of the uncertainties, that we
[9] need to take heed of our current scientific
[10] knowledge.
[11] There are three or four lines of arguments
[12] they use to try and undermine the science. First,
[13] they argue, are we sure that the increases in
[14] atmospheric carbon dioxide are really due to human
[15] activities, not changes in nature?
[16] There's three lines of evidence that
[17] convinced me, and nearly everybody else, that it's
[18] human activities causing these increases. First,
[19] the natural variability in carbon dioxide is only a
[20] few parts per million. Since the pre-industrial
[21] revolution we've seen an increase of 80 parts per
[22] million, way outside any natural variability.

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[1] Secondly, the atmospheric concentrations
[2] have gone up absolutely at the same time that we
[3] started to emit these large amounts of carbon
[4] dioxide from deforestation and from the burning of
[5] fossil fuels--coal, oil, and gas.
[6] And thirdly, when you burn fossil fuels,
[7] they have a special fingerprint called the isotopic
[8] ratio. We've actually looked at this fingerprint
[9] in the atmosphere and we can show quite
[10] definitively, that the increase in carbon dioxide
[11] is not due to a change in natural variability but
[12] due to burning fossil fuels.
[13] Then the skeptics say, "Are we really sure
[14] the temperature's increased?" "Isn't our data
[15] record contaminated by the so-called urban heat
[16] island, in effect?" The answer is no. We've
[17] measured temperature three ways. The air above the
[18] land, the air above the ocean, and the surface
[19] water of the ocean. All three data sets show
[20] exactly the same trend.
[21] There's no way all three data sets could
[22] be equally contaminated.

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[1] The skeptics then argue that in the last
[2] 18 years we've got a satellite data record, clearly
[3] the best thing around, but it doesn't show a
[4] significant increase. What we've got to recognize
[5] is the satellite data measures the temperature of
[6] the atmosphere from 5,000 feet to 30,000 feet above
[7] the Earth's surface. It doesn't measure it where
[8] we live, on the Earth's surface.

[9] And the atmospheric temperature is very
[10] sensitive to ozone depletion, which is caused by
[11] human activities, and natural phenomena such as
[12] volcanic activity and changes such as El Nino.

[13] When you allow for the ozone depletion and
[14] the natural variability, even the satellite record
[15] shows an increase with temperature. It's a little
[16] bit less than the ground-based record and it's a
[17] little bit less than theory, but it is not really
[18] inconsistent.

[19] Secondly, the temperature of record is
[20] only 18 years, from the satellite, and it's natural
[21] variability in climate which means any short record
[22] is very, very difficult to use for a long-term

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[1] trend.

[2] Third, the question is, Are we really sure
[3] it's due to greenhouse gases, or could it be
[4] changes in the sunlight? There's absolutely no
[5] question, changes in solar output do affect
[6] climate.

[7] But we have very, very few measurements
[8] that directly measure the output of the sun. We
[9] have satellite records from 1979. They show a
[10] very, very small variation in solar output,
[11] correspondingly, a very small variation in climate.

[12] The indirect measurements over the last
[13] 100 years, or so, are indirect. In IPCC, we try to
[14] allow for the change in solar output and how it
[15] affected the Earth's climate.

[16] We do believe the Earth's climate has been
[17] affected by change in solar output, but only a few
[18] percent of the observed change can be attributed to
[19] solar output. The large majority must be
[20] effectively attributed to greenhouse gases.

[21] And in fact if it's the warming effect of
[22] the sun, that affects the Earth's climate,

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[1] greenhouse gases have exactly the same fate. They
[2] warm the Earth by a small change in the heat
[3] content. Hence, if the sun can warm the
[4] atmosphere, so can effectively greenhouse gases.

[5] Lastly, Mr. President, Mr. Vice President,
[6] many people say our general circulation models are
[7] not very accurate, and they're not very reliable.
[8] They are right; we have uncertainties.

[9] Let me make absolutely clear—we do not
[10] know everything. But at the same time, these
[11] models simulate most of the large-scale effects
[12] that we see.

[13] In fact when we look at the observational
[14] record for the last 100 years, and we look at what
[15] theory shows, when you take into account both the
[16] increases in the greenhouse gases and the increases
[17] in the aerosols, there's a very good correspondence
[18] between the observed temperatures and the predicted
[19] temperatures.

[20] The changes in rainfall that Tom Karl
[21] said, are also consistent between theory and
[22] observation. The other way of saying it is we

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[1] cannot explain the observed changes on natural—
[2] I believe that while the skeptics are
[3] right in saying there are uncertainties, there is a
[4] lot we do know, and the large majority of
[5] scientists do believe this is a very serious
[6] environmental issue.

[7] **PRESIDENT CLINTON:** Let me ask you a
[8] follow-up question, and perhaps someone else would
[9] like to answer, but I think it's important. Again,
[10] I—and forgive—for those of you in the audience
[11] who know a lot more about this than I do, you will
[12] have to forgive me, but I am also trying to imagine
[13] how this is going to be absorbed by our Nation and
[14] by people who will be following this.

[15] It appears that we are headed into a
[16] powerful El Nino, and I wonder if one of you would
[17] just simply, very briefly, explain what that is and
[18] whether you believe there is a link between the
[19] power of the El Nino and the climate change.

[20] **DR. WATSON:** Yes. Every two to seven
[21] years, we have a phenomenon called the El Nino
[22] phenomenon. The ocean temperatures of South

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[1] America, in the Pacific, warm up, and they
[2] effectively have a large-scale effect on
[3] temperature patterns and precipitation patterns
[4] throughout the world.

[5] You get heavy rainfall in Peru, a draught
[6] in northeast Brazil, a drought in Zimbabwe, and
[7] major effects in countries such as Australia.

[8] One of the questions we have to ask
[9] ourselves is: Are these El Nino events changing?
[10] What we have observed in the last 20 years is we
[11] have now had the largest, almost intense El Nino in
[12] 1982, and it is looking like the one we have now
[13] may well be the most intense of the last 200 years.
[14] The question is: Are we changing the
[15] frequency and the magnitude of these so-called El
[16] Nino events because of global warming? We don't
[17] know, but, just like there are more floods at the
[18] moment and more droughts throughout the world, it
[19] is interesting to note that as the greenhouse gas
[20] concentrations are increasing, it does appear that
[21] the frequency and magnitude of these El Nino events
[22] also seems to be changing, and they have profound

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[1] effects, as I said earlier, both on temperature and
[2] precipitation, truly around the globe.

[3] **VICE PRESIDENT GORE:** I would just like to
[4] comment on your remarks concerning the skeptics. I
[5] personally believe we have had experience with a
[6] form of skepticism that I think is similar to this
[7] before.

[8] In 1964, the scientific community, through
[9] the Surgeon General's report, said that smoking
[10] cigarettes causes lung cancer, and for the last 33
[11] years, up until this summer, the CEOs of the
[12] tobacco companies said with a straight face and
[13] seemingly no embarrassment, there is no link
[14] between smoking cigarettes and lung cancer.

[15] Some scientists say, even today, the exact
[16] causal relationship is very difficult to pin down
[17] because science can't answer all of the questions,
[18] but it is abundantly obvious that it does, and the
[19] President has been leading our country's fight on
[20] that issue, and thank goodness, eventually, the
[21] weight of opinion got to be such that most
[22] everybody, except this very, very tiny band, became

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[1] embarrassed to parrot that line anymore. And I
[2] think that the weight of evidence here is in the
[3] same category.

[4] **PRESIDENT CLINTON:** We have got to wrap up
[5] the first panel and get on to the next one, but I'd
[6] like to ask—I think I'd like to ask, John, for you
[7] to respond to this. If anyone else wishes to,
[8] you're welcome to.

[9] I think there's a more sophisticated
[10] question to be asked, although the Vice President
[11] is right, there still are some people who claim
[12] that this scientific case, that I have been
[13] completely persuaded by, has not been made.

[14] I think the more difficult argument, John,
[15] goes something like this. Look, you put all this
[16] stuff in the atmosphere, and it says there for a
[17] hundred years at least, and maybe longer. So
[18] what's the hurry? And in a democracy, it's very
[19] hard to artificially impose things on people they
[20] can't tangibly feel, and so why shouldn't we just
[21] keep on rocking along with the kind of
[22] technological progress we're making now until there

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[1] really is both better scientific information and
[2] completely painless technological fixes that are
[3] apparent to all? Why shouldn't we just wait until
[4] all doubt has been resolved and, hopefully, we have
[5] even better technology? Because, after all, the
[6] full impact of whatever we do, if we start
[7] tomorrow, won't be felt for decades, and maybe even
[8] for a century.

[9] Number one, is that true? How quickly
[10] could we lower the temperature of the planet below
[11] what it otherwise would be? And number two, what
[12] about the argument on the merits?

[13] **DR. HOLDREN:** Mr. President, let me take a
[14] try at addressing that.

[15] It is clear that the task that you and
[16] other policy-makers face in this situation is a
[17] tough one. Business as usual is what most people
[18] are comfortable with.

[19] The difficulty is that our health and our
[20] economic well-being are more dependent on climate
[21] than most people think. Human disruption of
[22] climate by greenhouse gas emissions is almost

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[1] certainly further along than most people think, and
[2] directly addressing the point you were just making,
[3] reducing greenhouse gas emissions enough to avert
[4] much larger disruption than experienced so far is
[5] going to be more difficult than most people think.

[6] And the longer we wait, the more we coast
[7] up that business-as-usual trajectory, the more
[8] old-style technologies are going to be in place in
[9] this country and around the world, and the harder
[10] it is going to be to get off of that track.

[11] The goal of the framework convention on
[12] climate change, to which the United States is a
[13] party—it was ratified by the United States Senate
[14] in 1992—is to stabilize greenhouse gas
[15] concentrations at a level that prevents dangerous
[16] human interference in the climate system.

[17] Now, there is no formal agreement yet
[18] about what constitutes dangerous interference, but
[19] I know a very few analysts who have looked
[20] seriously at the impacts side of this question, who
[21] think that going beyond twice the pre-industrial
[22] carbon dioxide concentration is anything other than

[1] very dangerous. That would be about 550 parts per
[2] million, compared to 365 parts per million today,
[3] 280 pre-industrial, and you saw earlier a
[4] simulation of the considerable temperature changes
[5] that that would entail.

[6] Now, the problem is that stopping even at
[7] that 550-part-per-million level, twice
[8] pre-industrial, it is not going to be easy. The
[9] curves that are on the screen now show future world
[10] emissions of carbon dioxide under business as
[11] usual, which is the reddish line at the top, and
[12] then under three trajectories that would stabilize
[13] the concentration, at levels ranging from 350 parts
[14] per million on the bottom, a little less than
[15] today's, to 750 on the top of the line, the highest
[16] of the lines that bend over, another orange one,
[17] the green one in the middle is the
[18] 550-parts-per-million trajectory, the trajectory
[19] that stabilizes at twice pre-industrial CO2.

[20] Now, that lowest trajectory might be the
[21] most desirable from the standpoint of giving us the
[22] greatest assurance of avoiding climatic changes

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[1] that we really won't like, but it is virtually not
[2] practical to get to that. We are already past the
[3] point where we can get to that trajectory.

[4] In fact, if you could see the scale more
[5] clearly, you would see that that one requires the
[6] emissions to go negative early in the next century,
[7] which is particularly difficult to manage.

[8] Now, the green trajectory that stabilizes
[9] at a doubling of pre-industrial carbon dioxide
[10] concentrations require that global
[11] emissions—global emissions, not U.S., but
[12] worldwide, including the developing
[13] countries—start to decline already in about the
[14] year 2030, and they do that from a peak in which
[15] average-per-capita emissions worldwide would be
[16] only one-fifth of U.S. per-capita emissions today.

[17] That is going to be very hard to do, and
[18] if we are going to do it, we need to start working
[19] on it today.

[20] The problem, basically, is that the world
[21] energy economic system is a lot like a super-tanker
[22] under full power. It's got huge momentum in the

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[1] direction it's heading. It's very hard to steer.
[2] It's got very bad brakes.

[3] The science that has been summarized here
[4] this morning is telling us that the super-tanker is
[5] headed for a reef. We can tell the water is
[6] getting shallower under the hull, even if we can't
[7] say exactly how far we can go before the reef rips
[8] the bottom out of that tanker.

[9] Now, in that situation, full speed ahead
[10] is clearly the wrong course. We need to start
[11] slowing and steering away from the reef of
[12] unmanageable degrees of climate change now, and
[13] since we are all in the same super-tanker,
[14] industrialized and less-developed countries
[15] together, we had better find ways to slow and to
[16] steer cooperatively, rather than bickering over who
[17] is holding the wheel.

[18] We have got a lot of tools available to
[19] help us with that steering effort. There are
[20] advanced technologies already on the shelf that can
[21] help us dramatically increase the efficiency of
[22] energy end use and can reduce sharply the emissions

[1] of carbon dioxide from energy supply. We need only
[2] some sensible attention to reducing the barriers to
[3] the more rapid and widespread diffusion of those
[4] advanced technologies already on the shelf, and
[5] there are new technologies that could be brought to
[6] the point of applicability, with expanded research
[7] and development, that would make increased energy
[8] efficiency and reduced carbon emissions even more
[9] cost effective, but now I am basically getting into
[10] parts of the story that other panels are going to
[11] deal with later today, and I'll leave that to them.
[12] **PRESIDENT CLINTON:** But I do want to make
[13] the following points. Number one, we can't get to
[14] the green line unless there is a global agreement
[15] that involves both the developing and the developed
[16] countries.

[17] Number two, however, that is not an excuse
[18] for us to do nothing because, if we do something,
[19] it will be better than it would have been otherwise
[20] because we are still the biggest contributor and
[21] will be until sometime well into the next century.

[22] And, number three, based on everything we

[1] know, it will be easier in some ways, particularly
[2] if they get the financial help they need, for
[3] developing countries to choose a different energy
[4] future in the first place than it will be for the
[5] developed countries to make the adjustments, which
[6] is not to say we don't have to make the
[7] adjustments, but to say that I have read a lot of
[8] the press coverage and people saying, "Oh, well, we
[9] are just using this for an excuse," or "We're not
[10] being fair to them," or "We don't want them to have
[11] a chance to grow." That is not true.

[12] The United States cannot maintain and
[13] enhance its own standard of living unless the
[14] developing nations grow, and grow rapidly. We
[15] support that, but they can choose a different
[16] energy future. And that has to be a part of this,
[17] but it is not an excuse for us to do nothing
[18] because whatever we do, we are going to make it
[19] better for ourselves and for the rest of the world
[20] than it otherwise would have been.

[21] I think it is important to point out what
[22] John showed us there on the green line. The green

[1] line—it requires to reach the green line. We have
[2] to have a worldwide action plan.

[3] **VICE PRESIDENT GORE:** And, Mr. President,
[4] if you will allow me to offer a footnote to that,
[5] another lesson that I heard from Dr. Holdren's
[6] presentation is that not only does the agreement
[7] have to include the developing countries in some
[8] way, along with the developed nations, but, also,
[9] if we wait—if we wait before we start, then we
[10] will lose the opportunity to hit that green line
[11] for another century or more, and so time is of the
[12] essence.

[13] Mr. President, they have asked me to
[14] announce that that is the close of Panel I. We are
[15] going to stay here while the second panel members
[16] come here, but, ladies and gentlemen, if you would,
[17] please join the President and me in expressing
[18] thanks to the members of this great panel.

[19] [Applause.]

[20] **VICE PRESIDENT GORE:** [In progress] come
[21] here, but ladies and gentlemen, if you would,
[22] please join the President and me in expressing

[1] thanks to the members of this great panel.

[2] [Applause.]

[3] **MODERATOR:** Ladies and gentlemen, please
[4] remain seated during the panel change.

[5] [Pause.]

[6] **VICE PRESIDENT GORE:** Ladies and
[7] gentlemen, could you please take your seats? We're
[8] going to start the second panel, and on behalf of
[9] the President, I'd like to call first on Secretary
[10] of Energy Federico Pena, and Mr. Secretary, if you
[11] could introduce your colleagues on this panel and
[12] kick it off, we'd appreciate it.

[13] **SECRETARY PENA:** I will, Mr. Vice
[14] President. Thank you very much, Mr. President.

[15] This panel will, I hope, make the point
[16] that technologies that exist today, or will soon be
[17] available, will allow us to have a smooth
[18] transition to a new economy where we will see
[19] greater energy efficiency help us reduce greenhouse
[20] gas emissions. That is the message I hope we can
[21] provide in this panel.

[22] Before I introduce the panelists, Mr. Vice

[1] President and Mr. President, let me make a few
[2] comments which I hope will put the technology
[3] discussion in broader perspective.

[4] Mr. President, a couple a weeks ago, your
[5] science advisors, the PCAST Council, issued a
[6] report to you, making it very clear that we need to
[7] invest more in research and development in the area
[8] of energy, and it was interesting that Dr. Holdren,
[9] who was on the first panel, chaired that committee
[10] for you.

[11] Secondly, there were a group of scientists
[12] who come from our five national laboratories, who
[13] also issued a report demonstrating that we can
[14] apply technologies and reduce greenhouse gas
[15] emissions without having a very significant impact
[16] on our economy, or the cost to our economy. And
[17] that has been one of the big debates raging in this
[18] discussion.

[19] Let me put this discussion in context by
[20] first referencing Chart No. 1, which is now on the
[21] screen. There. If you look at the sources of
[22] greenhouse gas emissions, this chart demonstrates

[1] that about one-third of the carbon dioxide
[2] emissions come from buildings, and by "buildings" I
[3] mean commercial buildings, homes, apartment
[4] complexes. About one-third comes from
[5] transportation, and I'll talk about that,
[6] momentarily. And about one-third comes from
[7] industry.

[8] If you consider, as the Vice President
[9] said in his opening remarks, that it is fossil
[10] fuels which produce energy which are largely the
[11] reason for greenhouse gas emissions, we can
[12] understand why it is that power plants that produce
[13] electricity account for so much of greenhouse gas
[14] emissions, particularly when coal or natural gas,
[15] in some cases, is being used.

[16] What I think most Americans don't
[17] appreciate is the fact that when power plants
[18] produce electricity for our homes, it takes three
[19] units of energy to produce one unit of energy for
[20] electricity.

[21] Let me put that in a different way. If
[22] you had three lumps of coal being used to burn in a

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[1] power plant, the electricity generated from that
[2] power plant would represent only one-third of the
[3] energy in those three lumps of coal and two-thirds
[4] of it is lost, either in hot water or steam, or
[5] other sources. So our challenge is to find a way
[6] to make those power plants more efficient with new
[7] technologies to reduce greenhouse gas emissions.

[8] Now as respects the three categories that
[9] were on the screen, and are still on the screen,
[10] let me break that down a little further so we can
[11] better understand how technologies will help us
[12] address this problem.

[13] If you look at the buildings sector, For
[14] example, electricity and natural gas supply most of
[15] the energy used in the building sector. Heating
[16] and cooling are responsible for more than half of
[17] the emissions for buildings.

[18] Appliances, whether they're computers or
[19] faxes or other appliances, are responsible for 20
[20] percent, and lighting accounts for 14 percent. So
[21] what can we do about that? I brought with me, Mr.
[22] President, a technology. This is a solar shingle.

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[1] These are available. Over time, we think they'll
[2] be more available in terms of cost.

[3] But by putting these in your home, or a
[4] building, you can substantially reduce the use of
[5] electricity and use the sun to bring power into
[6] your home, or your building, and I hope that
[7] perhaps we'll have further discussion from our
[8] panelists about that.

[9] Secondly, to my far right is a lamp, Mr.
[10] President, which I think you may have trouble
[11] seeing. It's a torchiere lamp; it's a little dark.
[12] But I want to point that out, because, right now,
[13] we use halogen lamps, and you can find them in our
[14] homes all the time.

[15] But they burn very brightly and they're
[16] very hot, and so they use a lot of energy. These
[17] new torchiere lamps use fluorescence and are 80
[18] percent more efficient.

[19] And I want to point out that Stanford
[20] University is going to be using these in the dorms
[21] because the halogen lamps are not only dangerous,
[22] because they create fires--

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[1] [Laughter.]
[2] --he's paying attention now--and they are
[3] more energy efficient.

[4] [Laughter and applause.]

[5] PRESIDENT CLINTON: It was in the parent's
[6] instruction manual.

[7] [Laughter.]

[8] SECRETARY PENA: The message is these
[9] technologies can make a big difference. If you
[10] look at transportation. We know that oil supplies
[11] virtually all of the energy used in the
[12] transportation sector. In transportation, 35
[13] percent of the emissions come from automobiles, 23
[14] from light trucks, including vans, minivans, and
[15] sport utility vehicles, about 13 percent from
[16] airplanes, et cetera. What can we do about that?

[17] And I hope Mary Good will address this
[18] subject in a second. As you know, we have this
[19] Partnership for New Generation Vehicle. This is a
[20] lithium ion battery, which can be used in a dual
[21] fuel vehicle with electric and natural gas use. We
[22] can, with these batteries, take the energy that is

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[1] lost when you break your vehicle, capture that
[2] energy and use it to accelerate your car.

[3] And so with this new technology we can
[4] make our automobiles more efficient. It exists.
[5] The last sector is the industrial sector, and
[6] there, 80 percent of the emissions come from
[7] petroleum refinery, chemicals, paper, forest
[8] products, metal production, and you, in your
[9] comments, Mr. President, alluded to the fact that a
[10] number of industries have voluntarily started to
[11] reduce their energy use.

[12] And we're very pleased, For example, that
[13] the metal casting industry has set a goal of a 20
[14] percent reduction in energy use over a certain time
[15] frame.

[16] So technologies, we believe, can make a
[17] significant difference in reducing greenhouse gas
[18] emissions, they are good for our economy, good for
[19] U.S. companies, and good for our environment.

[20] In closing, Mr. President, when you made
[21] your address before the United Nations, you
[22] challenged all of the laboratories of the Federal

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[1] Government to come together and put together a
[2] strategic plan on how we can support, working very
[3] closely with the private sector, new technologies
[4] to reduce greenhouse gas emissions.

[5] And we are already working with our
[6] scientists, they are quickly putting that report
[7] together, and we'll present it to you very shortly.

[8] To help us have I think a very good
[9] discussion on technology, we have an outstanding
[10] group of panelists today.

[11] First, let me introduce Mr. Tom Casten,
[12] who is CEO of Trigen Energy Corporation, who
[13] understands, very well, how business can more
[14] effectively make use of energy that currently is
[15] wasted.

[16] Also with us today is Kurt Yeager, to my
[17] left, who is the president of the Electric Power
[18] Research Institute, an expert on electric
[19] utilities, and the potential in that industry for
[20] increased efficiencies in generation and
[21] transmission.

[22] Over here is Mary Good, former Under

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[1] Secretary of Commerce for Technology and now
[2] Managing Member of the Venture Capital Investors,
[3] who will discuss the new supercar of the new
[4] century.

[5] Also with us today is Michael Bonsignore,
[6] chairman and CEO of Honeywell, who will discuss how
[7] business can adopt cost-effective energy saving
[8] technologies in the building and industry sectors.

[9] Also with us is Mason Willrich, CEO of
[10] EnergyWorks, an expert in renewable energy sources,
[11] who will discuss the potential that renewables such
[12] as wind and solar and biomass can be used in
[13] reducing greenhouse gas emissions, and then Mr.
[14] Larry Papay, a member of your PCAST task force on
[15] R&D, who knows a lot about the potential for
[16] technologies that are still on the drawing board,
[17] but which I think are very exciting for the future.

[18] So Mr. President, Mr. Vice President,
[19] these are our panel members, and I think at this
[20] point I'll turn it back over to you and the Vice
[21] President.

[22] PRESIDENT CLINTON: Thank you.

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[1] I'd like to start with Mr. Casten and ask
[2] him to describe his company's work in recapturing
[3] waste energy to heat houses and buildings, and
[4] discuss the potential market for the technology in
[5] the country.

[6] **MR. CASTEN:** Thank you, Mr. President.

[7] The Secretary's given my speech already.

[8] I'd like to focus on where 70 percent of
[9] the emissions of CO2 come from, which is in the
[10] production of heat and power, and my message is
[11] simple.

[12] At present we make heat in one plant and
[13] electricity in another plant, and as a result U.S.
[14] power plants waste a lot of fuel.

[15] Regulation protects this waste from market
[16] forces. Now to reduce CO2 emissions we could leave
[17] the monopolies intact, and force the country to
[18] deploy some exotic and expensive technologies and
[19] maybe force them to switch from coal to natural gas
[20] and this would disrupt the economy.

[21] People who think this is the plan respond
[22] to your call for climate change mitigation as if

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[1] they were told they've got a terminal illness.
[2] They want a second opinion. They want to quibble
[3] about the science.

[4] But using one power plant to produce
[5] electricity and another one to produce heat is just
[6] not efficient. As the Secretary said today, when
[7] we burn three units of fossil fuel—coal, oil or
[8] natural gas—only one ends up as electricity. Two
[9] end up as waste up the chimney or out in the
[10] harbor. Gone.

[11] That heat could be used for buildings in
[12] industry. We have two fires when one would do.
[13] The heat that we waste in U.S. electric production
[14] alone is equal to the total energy use in Japan.

[15] Unfortunately, our outmoded laws forbid
[16] competition, thus discourage innovation and
[17] efficiency. The result is waste of fuel.

[18] Let me illustrate this with a local
[19] example. Two miles south of here, there is a coal-fired
[20] electric generating plant. Like hundreds of
[21] others, it produces 400 megawatts of electricity
[22] and dumps 800 megawatts of heat into the Potomac

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[1] River. At the same time, Georgetown, the Pentagon,
[2] National Airport, Howard University, and GSA all
[3] burn more fuel in order to make the heat that was
[4] just thrown away. The electric plants' waste heat
[5] could replace all of these boilers, and this would
[6] of course reduce CO2 emissions, dramatically,
[7] improve Washington, D.C. air quality, and I think
[8] save a lot of money.

[9] Using electric plant waste heat is not
[10] just theory. Trigen Energy Corporation heats 6,000
[11] buildings and numerous industrial plants in 14
[12] cities with combined heat and power.

[13] We recover normally wasted heat from
[14] electric generation to feed our steam and chilled
[15] water systems. Customers save money, pollutants
[16] drop by 90 percent, and we have the CO2 emissions,
[17] and we save money.

[18] Here's three examples of where we're doing
[19] that. In Philadelphia, our steam system heats
[20] downtown buildings and the University of
[21] Pennsylvania.

[22] With partners PECO and NRG [ph], we are

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[1] installing a gas turbine that will make 150
[2] megawatts of electricity and 250 megawatts of heat.

[3] In Chicago, we heat and cool the McCormick
[4] Place Convention Center with combined heat and
[5] power.

[6] In Golden, Colorado, in partnership with
[7] Tucson Electric, we burn coal to make electricity
[8] and then sell the left-over heat to Coors to make
[9] beer, and also to heat the Colorado School of
[10] Mines.

[11] The potential for CO2 reduction is huge.
[12] Increasing the average U.S. electric generation
[13] efficiency to just what we're achieving today would
[14] reduce U.S. CO2 emissions by 23 percent, and save
[15] money.

[16] Mr. President, doubling U.S. power plant
[17] efficiency is feasible, and in my view, essential.
[18] America's entrepreneurs will eliminate energy waste
[19] if they're given a chance to compete. Then they
[20] will sell their efficiency all over the world.

[21] When you go to Kyoto, I hope you'll play
[22] to our strength. Tell the other nations that we

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[1] will open our electric markets to competition, that
[2] we will unleash our entrepreneurial strength to
[3] improve power plants worldwide. Thank you.

[4] [Applause.]

[5] **PRESIDENT CLINTON:** Mr. Casten, for the
[6] benefit of—if there's anybody here that doesn't
[7] understand the intricacies of the electric utility
[8] regulation—and there will doubtless be people out
[9] in the country that don't, even people who pay big
[10] electric bills—why don't you, just very briefly
[11] explain, so we can follow this chain of thought all
[12] the way through, the people who are reporting on
[13] this, what the present state of the law is, and
[14] what the proposals are, and specifically what you
[15] think ought to be done by whom.

[16] Just don't assume that everybody knows
[17] this. Keep in mind, we're doing this for the
[18] general public, too. So just very briefly, say
[19] that.

[20] **MR. CASTEN:** Mr. President, we began in
[21] about 1930 to make electric a monopoly, and we set
[22] up state laws in every state that said you get a

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[1] territory and you get to sell electricity to
[2] everybody in that territory, and nobody else can
[3] sell it.

[4] We later on added Federal laws that
[5] prevented the electric utilities from buying each
[6] other or becoming more efficient.

[7] We then wove a tapestry of regulations
[8] that—just full of little black threads that stop
[9] efficiency. Every place you turn, somebody has,
[10] based on this paradigm of electric only, and put a
[11] regulation in place that stops it. Our
[12] environmental regulations don't really focus on
[13] efficiency and reward it.

[14] What needs to happen—it's about the only
[15] industry that's left as a protected monopoly—is
[16] that we need to end the monopoly, work through a
[17] transition. Remember that billions of dollars were
[18] invested by our utilities relying on those rules,
[19] so we've got to find a way to move through and give
[20] them some incentive to move to a more efficient and
[21] a modern world, and I think we can do it.

[22] **VICE PRESIDENT GORE:** Very good. I think

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[1] that we're going to Kurt Yeager next, right?
[2] **SECRETARY PENA:** That's correct, Mr. Vice
[3] President.
[4] **VICE PRESIDENT GORE:** Do you want to--well, Kurt
[5] Yeager is president of the Electric
[6] Power Research Institute, which is formed by,
[7] funded by electric utilities, and Mr. Yeager, how
[8] can we reduce greenhouse gas emissions in
[9] facilities like power plants that use so many
[10] fossil fuels?
[11] **MR. YEAGER:** Well, thank you, Mr.
[12] President, Mr. Vice President, Mr. Secretary. It's
[13] important to begin by recognizing that these plants
[14] today produce about two-thirds of the nation's
[15] electric power, and the paradox in that is that the
[16] electricity that they produce eliminates far more
[17] carbon in our economy than the plants themselves
[18] emit.
[19] Now within the context of that paradox
[20] there are a number of things that we can do, and I
[21] would begin by reporting that technological
[22] innovation is steadily reducing, not only the U.S.

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[1] but the world's carbon diet, by substituting less
[2] carbon-intensive energy sources and by steadily
[3] promoting the more efficient use of all our energy
[4] forms.
[5] This progress is very important because on
[6] a worldwide basis, 90 percent of all the energy
[7] that the world uses contains carbon.
[8] The challenge we face is continuing that
[9] progress by wisely deploying the technology
[10] opportunities that are becoming available on a
[11] global scale. And a key enabling factor in this
[12] sustainability of decarbonization is electricity,
[13] and its growing role in our global energy system.
[14] First--and I just underscore three
[15] observations in that regard--first, it enables the
[16] use of carbon-free energy sources, such as
[17] renewable energy, nuclear power.
[18] Second, it enhances the efficiency with
[19] which we use energy throughout our economy.
[20] And I'd say third, and most importantly,
[21] it is the engine of innovation. It is the basis on
[22] which technological progress has evolved in this

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[1] last century. Witness the computer revolution
[2] today, and the efficiency of productivity that it
[3] brings to every part of our economy. And as a
[4] result we can realistically envision, as we look
[5] forward into the future, creating an energy economy
[6] on a global scale that depends on electricity and
[7] hydrogen, based on efficiency and free of carbon.
[8] The essential factor in promoting this
[9] progress, which is shown in the figure on the
[10] board, rather than limiting this global de-carbonization is
[11] providing flexibility, and that is
[12] the ability to take best advantage of technology
[13] progress and knowledge.
[14] And to avoid counterproductive costs which
[15] could both prejudice our economic vitality and the
[16] very jobs on which sustainable progress also
[17] depends.
[18] And in this regard, U.S. technology, I
[19] believe, is uniquely positioned for two-pronged
[20] leadership in emerging innovations. First, by
[21] accelerating global electrification as the
[22] essential foundation for de-carbonization, and for

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[1] eliminating the poverty and hopelessness that now
[2] plagues some 2 billion people on this planet who
[3] are now without electricity. And second, by
[4] developing and deploying a portfolio of cleaner
[5] energy alternatives, using that electricity
[6] platform.
[7] And I believe the result would be both
[8] environmental progress as well as increased global
[9] security and new markets for U.S. goods and
[10] services.
[11] And this portfolio would include four
[12] primary dimensions. First, clean coal and biomass
[13] technologies that we have spent a great deal of
[14] effort through the national economy in developing,
[15] and to reduce the world's dependence on those
[16] fuels. Particularly important is the gassification
[17] of those, to move them from high carbon fuels to
[18] lower carbon, and also more efficient fuels.
[19] Second, to bring forward solar-based
[20] renewable energy, particularly in the developing
[21] parts of the world that have low energy
[22] requirements today. To expand the use of safe

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[1] carbon-free nuclear power, led by U.S. leadership
[2] in this area. And finally, new transportation
[3] systems which both move away from carbon and
[4] imported oil.
[5] In conclusion, I must also stress,
[6] however, that this progress will depend on re-energizing
[7] what has been our lagging U.S.
[8] investment structure, both public and private,
[9] domestic and international.
[10] And this urgent investment includes both
[11] the R&D engine in which technical progress and
[12] innovation depend, and for commercializing and
[13] deploying the results on a global scale.
[14] With the end of the Cold War, we're on the
[15] brink of a period of great technological
[16] opportunity in service to mankind. We must,
[17] however, invest wisely and persistently if we're to
[18] achieve a truly sustainable energy foundation for
[19] the world. This foundation must support both the
[20] environmental and economic aspirations of our
[21] rapidly growing and increasingly interdependent
[22] global society. Thank you.

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[1] [Applause.]
[2] **PRESIDENT CLINTON:** Let me just say before
[3] we go on to the transportation sector, these
[4] presentations have been quite important. I
[5] remember, 20 years ago, more or less--maybe a
[6] little less than that, I can't remember exactly
[7] when--that the Congress voted, or the Federal
[8] Government at least required--it might have been a
[9] regulatory action--that the new power plants not
[10] use natural gas anymore, and that we phase out of
[11] them because we grossly underestimated how much
[12] natural gas we had, and we thought we could go to
[13] clean coal because we didn't want to build nuclear
[14] plants, for all the reasons that were clear.
[15] And one of the biggest problems we face,
[16] now, in trying to make a reasoned judgment about
[17] how quickly we can reduce greenhouse gas emissions,
[18] and by how much, is the need not to be unfair to
[19] electric utilities that have billions of dollars
[20] invested in government approved power plants that
[21] they have not yet fully amortized.
[22] So that it's--now, there are--therefore,

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[1] in so far--and this applies both to buildings and
[2] to the utilities themselves, about which these two
[3] speakers have spoken. You can either conserve more
[4] in the production of electricity, or you can have
[5] the people who consume it conserve more, or you
[6] could change the basis on which the plants work,
[7] which is the most expensive way to do it.

[8] Therefore, in so far as we can do more in
[9] terms of how much electricity people use, or how
[10] much waste heat you recover, either one of those
[11] things is a far preferable, far preferable
[12] alternative than to change the basis on which
[13] plants that have already been built are being
[14] amortized, and will generate huge amounts of
[15] savings at lower cost, if we can do it.

[16] At the end of this session, we'll get
[17] around to the, sort of the skeptical economist take
[18] on the technological fix. We'll get around to that
[19] later. But I just think it's important that we
[20] focus on this specific issue, because if our goal
[21] is to minimize economic dislocation, then having
[22] conservation by the end-users, the people who have

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[1] the buildings. For example, whether they're
[2] manufacturers or residential buildings, are other
[3] business buildings, and having recovery of waste
[4] heat, are clearly, I think, the preferable
[5] alternatives, and clearly, the less expensive
[6] alternative.

[7] I'd like to call on Mary Good, now, who
[8] was the Under Secretary of Commerce for Technology
[9] in our administration for four years, and now is
[10] the Managing Member of Venture Capital Investors.

[11] I want her to talk a little bit about the
[12] potential for technological advances to reduce
[13] emissions in the transportation sector, and to
[14] focus particularly on the Partnership for New
[15] Generation Vehicle that we've been working on with
[16] the auto companies and the UAW since this
[17] administration took office, and Mary had a lot to
[18] do with it.

[19] There is also a huge debate here about how
[20] much we can do, how quickly, and we have to make
[21] the best judgment about this in determining what to
[22] say about it when we are in Kyoto, because

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[1] transportation, as Secretary Pena said, occupies
[2] such a large part of this whole equation. So Mary,
[3] have at it.

[4] DR. GOOD: Thank you very much, Mr.
[5] President.

[6] PRESIDENT CLINTON: Tell me what I should
[7] say in Japan about this.

[8] DR. GOOD: Well, thank you very much, Mr.
[9] President, and Mr. Vice President. You have sort
[10] of set the stage for transportation because the
[11] infrastructure problem is very big and very real in
[12] transportation.

[13] The issue about the use of transportation,
[14] of a third of the energy, is real. That means it's
[15] a big piece of the whole issue. It is also, at the
[16] same time, absolutely vital to have efficient low-cost
[17] transportation because the economy depends on
[18] it as well.

[19] And then you're saddled with an
[20] infrastructure that we poured trillions of dollars
[21] into over the last 100 years, in roads and
[22] waterways, and railroads, and what have you, which

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[1] are there, and we have them.

[2] And so the issue--and not only that. But
[3] we've built a whole transportation system based on
[4] the use of petroleum products. So you have all of
[5] the problems that you put on the table, sort of in
[6] one bundle, in a sense, in transportation.

[7] So if you look at that, the short-term
[8] fixes have to be focused on efficiency. We've got
[9] to get better efficiency out of the systems, and
[10] programs like the Partnership for a New Generation
[11] Vehicle are clearly the way to go.

[12] Not only that, but it's the way to go for
[13] lots of reasons. The goal here was to reduce the
[14] ability of the fleet of automobiles to use a third
[15] of the fuel they presently use. That's a huge
[16] reduction.

[17] But it was a partnership between the
[18] government and between the private industry and it
[19] required a lot of trust on both sides, still does,
[20] and one of the biggest issues of trying to get it
[21] done is to keep that trust going on both sides, to
[22] really move it and to do it well.

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[1] But this was an example of where you've
[2] involved not only the Big Three auto companies, but
[3] we've also involved a lot of people out of the
[4] universities and the technology there. We've
[5] involved over 300 other industry partners, which
[6] people really don't understand.

[7] These are all of the suppliers to the
[8] automobile industry. The people who make the low
[9] weight materials, the people who make flywheels,
[10] that will hopefully make some of these hybrid cars
[11] possible.

[12] So you've involved a lot of people on a
[13] very focused program to get it in a relatively
[14] short time frame, because we asked them to have a
[15] manufacturable prototype in ten years. That is
[16] really asking a lot in an industry which makes
[17] incremental improvements over fairly large periods
[18] of time.

[19] I think they've made a lot of progress.
[20] It remains to be seen whether they're actually meet
[21] that goal, but that model for getting the industry
[22] to work on these efficiencies, I think, clearly,

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[1] has to happen, and has to happen in a much more
[2] focused way, and much more rapidly than we've done
[3] in the past.

[4] For example, let me just talk about a
[5] couple of other things in my couple of minutes. We
[6] need also to begin to look at some new technologies
[7] in the rail industry as well. The railroads today,
[8] if you want to understand the problem, if you
[9] looked at the news last week on this problem with
[10] the railroad right now, where they are so confused
[11] they can't get products to where they need to be,
[12] this really has a huge negative impact on the
[13] economy.

[14] And you look at what we have done in
[15] research on new efforts in railroads, and I look at
[16] what the Japanese announced last week. They just
[17] announced, last week, a new demonstration of their
[18] levitated train that runs 295 miles an hour with
[19] the kind of energy efficiency you wouldn't believe.
[20] We have no research program, even, anymore, in
[21] levitation.

[22] So those are the kinds of things, on the

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[1] longer range, we need to look at as well.
[2] And one last piece. With respect to the
[3] fuel issue, to change from petroleum based, the
[4] only other source we have is biomass, frankly, when
[5] you really look at all the other options.

[6] And the problem is we've been talking
[7] about biomass, using up useable farmland, and in
[8] today's world, across the world, that's not very
[9] feasible, frankly. To grow enough biomass to phase
[10] out petroleum for transportation is just not very
[11] feasible. We need that for something else.

[12] But we've learned a lot about plant
[13] biology in the last 20 years. We've put a lot of
[14] money in basic research.

[15] We know now how to actually translate
[16] plants that can be much more CO2 absorption
[17] efficient. One of these turns out to be algae, and
[18] there's some technology right now that's ready for
[19] demonstration, which is ocean-grown algae, where
[20] you actually farm the ocean, grow these things most
[21] people don't want because they grow fast, and they
[22] use up so much CO2. You could harvest those,

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[1] process them on the ocean, make methanol and tank
[2] it like we do all other liquid fuels.

[3] So there's really major opportunities.
[4] The short term is efficiency. The longer term has
[5] to be willing to look at some really new ways of
[6] looking at how to get fuel. Thank you; appreciate
[7] it very much.

[8] **PRESIDENT CLINTON:** I just might add that--yeah,
[9] give her a hand.

[10] [Applause.]

[11] **PRESIDENT CLINTON:** I just want to make
[12] two brief points. The leaders of the Big Three
[13] auto companies and the UAW came in to see us last
[14] week, and they said they're going to meet their
[15] Partnership for the Next Generation Vehicle goal.

[16] The real problem is once they develop a
[17] prototype, how quickly can it be mass produced and
[18] how will people buy it? And will they buy it at
[19] present fuel prices?

[20] We'll come back to that in the end, but,
[21] you know, one related question to that is given
[22] Americans' buying habits and consumer preferences,

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[1] don't we have to include these light trucks, and
[2] even heavy trucks in this Partnership for the Next
[3] Generation Vehicle? Don't we have to achieve
[4] significant fuel efficiencies there as well, if we
[5] have any hope of succeeding here?

[6] The only other point I want to make, Mary,
[7] is, you know, I'm big on all kinds of fast rail
[8] research, but I hope tomorrow's headline isn't
[9] "Clinton Advocates More Research On Levitation."

[10] [Laughter.]

[11] **PRESIDENT CLINTON:** Oh, yeah. I don't
[12] need that!

[13] **DR. GOOD:** We'll have to explain it to
[14] them better.

[15] **PRESIDENT CLINTON:** I'd like to call on
[16] Michael Bonsignore, now, to talk about the energy
[17] savings available through the use of more high-efficiency
[18] products and systems, and also the
[19] potential for environmental technology exports.

[20] What he has to say about how applicable
[21] and expandable you believe it is, has a lot to do
[22] with whether this transition we're going through

[1] will be an economic plus, a drag, or a wash. I
[2] personally have always believed it would be a plus,
[3] if we did it right. But I'd like to ask Michael to
[4] talk about that.

[5] **MR. BONSIGNORE:** Thank you, Mr. President,
[6] Mr. Vice President, Mr. Secretary. It's an honor
[7] for Honeywell to be a part of this discussion on
[8] global warming and the application of technology to
[9] mitigate it.

[10] We do see a very healthy climate,
[11] worldwide, for the export of these energy
[12] efficiency technologies.

[13] Honeywell's point of relevance here, and
[14] point of reference is we've been in the energy
[15] efficiency business for 112 years. We operate in
[16] 95 countries around the world and about 40 percent
[17] of our sales come from outside the United States.

[18] So we see this energy efficiency issue up
[19] close in the developed and the developing world,
[20] really, across the globe.

[21] The first point I would like to stress is
[22] that there are many existing technologies that

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[1] could be deployed immediately to reduce energy use
[2] and the related emissions that come along with it.

[3] There's no question that the United States
[4] leads in environmental technology and this is
[5] really a time in the world when the demand for that
[6] technology is growing every day.

[7] There's a great social awareness in the
[8] developing world for the quality of life, for the
[9] quality of the atmosphere, for what the industrial
[10] infrastructure increase is going to do, ultimately,
[11] to the quality of life in these developing
[12] countries.

[13] I would also like to say that energy
[14] efficiency is currently the cheapest and the
[15] fastest to deploy and that provides us with a
[16] tremendous export opportunity as a function of the
[17] technology leadership that we demonstrate in so
[18] many different areas.

[19] You talked about some of the automotive
[20] innovation in your comments this morning, and the
[21] low wattage lighting we talk about, lighting
[22] controls. Simple things like insulation, that can

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[1] make a tremendous difference in terms of energy
[2] loss. Air quality control. Programmable
[3] thermostats that can make a big difference in terms
[4] of reducing energy consumption over a 24 hour
[5] period. Energy recovery systems that allow
[6] ventilation to occur without the waste of the
[7] energy that's been applied to either heat the air
[8] or cool the air, before the air is exchanged in the
[9] building.

[10] Real time pricing controls that allow
[11] large hotels, for example, to schedule their energy
[12] consumption at a time when it is the least
[13] expensive as a function of the power generation
[14] available. Doing the laundry at 2:00 in the
[15] morning as opposed to doing it at 6:00 o'clock in
[16] the evening when there's high demand.

[17] There is software available now for us to
[18] be able to manage the consumption of the energy on
[19] a demand profile which makes it most cost-efficient.

[20] The boiler controls we talked about
[21] earlier. Process controls to allow us to produce

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[1] gasoline, pulp and paper, chemicals, steel and
[2] aluminum products with less energy. I think all
[3] examples of technology that can be exported.
[4] The second point I'd like to stress is
[5] that the developing world is a major element in
[6] this overall global warming equation and it must be
[7] included in whatever policy gets made, ultimately.
[8] We're talking about two-thirds of the
[9] world's population here, and soon, 50 percent of
[10] the emissions that will be produced in the world
[11] will be produced from the developing countries.
[12] They have the most to gain from the
[13] technical assistance and the related financial
[14] support that the developed countries can provide,
[15] and I'd like to use one very vivid example that I
[16] followed personally, since it came to pass. This
[17] was in the city of Cracow, in Poland, where the
[18] city was quite concerned about the cost of energy,
[19] the inefficiency of the energy use, and the impact
[20] of that inefficiency on the atmospheric conditions
[21] in the city.
[22] Without the assistance of the Department

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[1] of Energy to put together a seed demonstration
[2] project, this project would probably never have
[3] occurred because the city of Cracow was clearly
[4] unqualified for any kind of standard commercial
[5] financial terms.
[6] And by getting this seed money available
[7] from the Department of Energy, we were able to get
[8] the Cracow city modernized. It was very
[9] significant, a 23 percent reduction in the energy
[10] requirements, the emissions in the city,
[11] significant reductions in CO2, and other related
[12] emissions.
[13] And I think it was a really good example
[14] of the need to look for clever and creative ways to
[15] bring financing support into the developed world as
[16] well as the energy efficiency technology
[17] themselves.
[18] I'd like to make just two other points
[19] before I close. One is that I think we should do
[20] everything possible to develop some kind of a
[21] system of credits that encourages people to make
[22] these energy efficiency investments early rather

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[1] than late.
[2] When one looks at these curves, and sees
[3] these curves constantly getting higher and higher
[4] in terms of the demand, there may be a resistance
[5] to invest now because the future would just require
[6] even more investment.
[7] And I think there needs to be a system of
[8] credit for these people who are willing to take
[9] early initiative to reduce emissions.
[10] And the second point, and last point I'd
[11] like to make is the Federal Government really needs
[12] to "walk the talk" and take the leadership here.
[13] It's the largest consumer of energy in the United
[14] States. I think the Alliance To Save Energy
[15] demonstrated that the Federal Government wastes
[16] one-quarter of the energy it purchases.
[17] That relates to about a billion dollars in
[18] annual savings to the Treasury, and millions of
[19] tons of CO2 emissions avoided, and I think in the
[20] spirit of this whole debate, it's really an
[21] opportunity for the Federal Government to step up
[22] and take a real position of leadership in this

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[1] whole area of energy efficiency.
[2] [Applause.]
[3] VICE PRESIDENT GORE: Let me ask a brief
[4] question, if I could, Mr. Bonsignore.
[5] What you've said makes it clear that when
[6] there's waste in the form of pollution and waste in
[7] the form of CO2, that that almost always represents
[8] economic waste as well. If you're burning raw
[9] materials to produce your product, plus a waste
[10] stream, if you can figure out a way to reduce the
[11] waste stream, whether it's CO2 or some other form
[12] of pollution, and put a higher percentage of your
[13] raw materials into the production of your product,
[14] that's going to benefit you, economically, at the
[15] same time it benefits the environment. Correct?
[16] MR. BONSIGNORE: Correct.
[17] VICE PRESIDENT GORE: Now a lot of
[18] economics analysts will say, you know, if it's as
[19] easy as you say, then since this information about
[20] this opportunity is available to people, why
[21] haven't they done it already? You've been in the
[22] business of trying to turn on the light bulb for

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[1] potential customers and tell them this. Why hasn't
[2] it happened more quickly already?
[3] We heard earlier from Mr. Casten about the
[4] role monopolies have played in holding it back, but
[5] what are some of the other obstacles?
[6] MR. BONSIGNORE: Well, I think, my sense
[7] is in the United States that we still have not been
[8] able to raise the level of awareness for the
[9] consumer of the real cost of energy--the real cost
[10] of energy in its total dimension.
[11] One only has to go into a gas pump in
[12] Belgium--and I lived in Europe for five years--and
[13] pay \$4 a gallon for gasoline, to really understand
[14] the real cost of energy.
[15] So I think there's a public awareness
[16] issue in the United States that needs to be dealt
[17] with and my feeling is that this whole debate about
[18] global warming, regardless of where it goes,
[19] ultimately, may serve to heighten the awareness in
[20] the American public of what the real cost of energy
[21] in its total dimension is.
[22] But I would also say that we're quite

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[1] encouraged by the degree to which this energy
[2] efficiency technology is being embraced now.
[3] A very poignant example in Beijing, where,
[4] as the quality of life in Beijing comes up as the
[5] Chinese economy accelerates, the Chinese people
[6] living in Beijing don't want to breathe dirty air,
[7] and they apply a tremendous amount of pressure on
[8] their officials and on the government to do
[9] something about the quality of air in Beijing. And
[10] so there's a real social motivation, far beyond the
[11] economic motivation, to really do something with
[12] some of these technologies.
[13] And I think at the end of the day, those
[14] are the incremental steps that will help us embrace
[15] these opportunities.
[16] VICE PRESIDENT GORE: Thank you very much.
[17] I think next on our program is Mason Willrich.
[18] Have I pronounced your name correctly?
[19] MR. WILLRICH: That's right.
[20] VICE PRESIDENT GORE: And he is the CEO of
[21] EnergyWorks, which is a joint venture involving
[22] Bechtel, the famous international engineering firm,

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[1] and Pacific Corp., a major electric utility of
[2] course. And EnergyWorks develops alternative
[3] energy projects, domestically, and internationally.
[4] What do you see as the potential for these
[5] new alternative energy sources?
[6] **MR. WILLRICH:** Mr. Vice President, Mr.
[7] President, it's a pleasure for me to be here, and
[8] to talk to you a bit about renewable energy
[9] sources.
[10] Let me start with just reminding ourselves
[11] that fossil fuels do, today, account for 85 percent
[12] of world energy consumption, and unless we change
[13] dramatically, as the amount of energy consumed
[14] overall in the world goes up, we are going to have
[15] that same fraction for the indefinite future.
[16] I think a major alternative is to expand
[17] our use of renewable energy from a few percent
[18] today to a large fraction of the world's energy
[19] consumption in the 21st century. Let me give some
[20] examples of expansion.
[21] Take wind, where there are now an array of
[22] modern turbines available, we have large wind farms

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[1] in California. One of the best resources in the
[2] United States for wind energy on a large scale is
[3] in the Middle West. Outside the United States,
[4] there are excellent wind regimes in Europe, in
[5] Spain, off of Germany and the North Sea, also in
[6] China and Argentina. So we needed to expand wind.
[7] We need to expand the use of solar energy.
[8] Solar photovoltaic panels, Mr. President, these
[9] convert sunlight directly into electricity. They
[10] are now used for telecommunications from remote
[11] areas, also telecommunications from our freeways.
[12] We need to expand, wherever cost effective, the use
[13] of solar photovoltaics, not just 1 million roofs in
[14] the United States, but, rather, throughout the
[15] world, and I believe that this would enable us for
[16] the first time to play a major role in bringing
[17] electricity to the 2 billion people out there that
[18] do not have access to electricity, and in a form
[19] that would not contribute to greenhouse gas
[20] emissions, and this is in the continents of Asia,
[21] Latin America, and, of course, Africa.
[22] Thirdly, biomass. We are using,

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[1] increasingly, the waste products from agricultural
[2] for our forest products industry, sugar cane,
[3] walnut shells, wood chips. We need to move through
[4] the adoption of gassification technologies into a
[5] more efficient use of our biomass resources, and we
[6] can at that point establish energy plantations on
[7] the marginal agricultural lands in the U.S. and
[8] also bring in biomass in several developing
[9] countries such as South China, India, and Brazil.
[10] To begin a transition, I would suggest a
[11] goal of 10 percent annual additions to electricity
[12] generation coming from renewable energy
[13] technologies, aside from large hydro projects, and
[14] I suggest we reach that goal within the next 10
[15] years. We should do it by providing our consumers
[16] in the United States, electricity consumers, with a
[17] choice of who they wish to buy their electricity
[18] from in a more competitive industry. I believe
[19] that that will create a circumstance where our
[20] consumers will pay premiums prices for energy
[21] derived from so-called green energy resources, and
[22] it will provide a market-driven renewable energy

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[1] industry.
[2] In the developing countries, I suggest
[3] that we need to continue to support the
[4] restructuring of the electricity industries in
[5] those countries. That will provide an opportunity
[6] to lay the basis for the kind of leapfrog in the
[7] developing countries where they can put in the
[8] infrastructure in the first instance in an
[9] efficient way and in a way in which it will have
[10] small modular electric generation and ultimately
[11] the basis for moving heavily into the renewable
[12] energy area.
[13] Finally, Mr. President, I am not running
[14] for office. I have no intention of running for
[15] office. However, I believe that we should reform
[16] energy prices through charges on carbon emissions.
[17] The use of various forms of fossil energy now
[18] imposes large health and environmental costs on all
[19] societies, and these are not reflected in the
[20] prices that consumers currently pay. So we are
[21] underpricing fossil energy, and that is perhaps the
[22] largest barrier to a transition to these

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[1] alternatives that we all want to achieve.
[2] I think that these that are initially low
[3] should be part of the proposal that we carry with
[4] us as a leader in the Kyoto conference.
[5] Thank you, Mr. Chairman.
[6] [Applause.]
[7] **PRESIDENT CLINTON:** I want to respond to
[8] that, but, first, I want Larry Papay to talk about
[9] some of the long-range technologies that are on the
[10] drawing board now and what he thinks the
[11] Government's role should be, what else should we
[12] do, how much more should we spend on R&D, how
[13] should we spend it, how should we target it, and
[14] what are the likely returns going to be, and what
[15] contribution can they make to any-to fulfilling
[16] any commitment we might make in Kyoto.
[17] **MR. PAPAY:** Thank you, Mr. Vice President
[18] and Mr. President.
[19] Back in January when you asked your
[20] Council of Advisors on Science and Technology to
[21] look at energy R&D, specifically looking to the
[22] 21st century, a panel was formed, and as was

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[1] mentioned, John Holdren chaired that, 21 people on
[2] the panel, people from industry, people from the
[3] national labs and other parts of Government, people
[4] from academia, people on sort of the hard side of
[5] technology and the soft side.
[6] There are several energy challenges in the
[7] slide that is up that lists these, and, of course,
[8] we are here today speaking about global warming,
[9] but it should be pointed out that in solving one
[10] problem, you can solve several.
[11] Take energy security, for example. In an
[12] unconstrained oil economy, going from about 8-1/2
[13] million barrels per day of imports probably to
[14] about 16 million barrels per day in 2030, if you
[15] were to introduce the technologies which also
[16] reduce carbon emissions, as well as reduce the
[17] importation of oil, you could probably cut that by
[18] more than half. And one of the projections in the
[19] PCAST report talks about reducing it by more than
[20] 10 million barrels of oil.
[21] There is a point up there on U.S. science
[22] and technology leadership, which is also extremely

[1] important. About 7 or 8 percent of the gross
[2] economy, not only in this country, but around the
[3] world, deals with energy, and as mentioned by prior
[4] speakers, there is an awful lot of growth occurring
[5] because energy drives the economic engine in these
[6] countries.

[7] Over several hundred billions of dollars
[8] annually are spent for the introduction of energy
[9] technologies in countries around the world, and
[10] there is no reason why the United States can't have
[11] a leadership position in that. And it also will go
[12] to help stabilize these economies.

[13] The next slide speaks about a little bit
[14] about the technologies that we examined in the
[15] PCAST panel review. We looked at efficiency
[16] renewables, fossil and nuclear. We talked about a
[17] PMGV-2, to push the limits there even further. We
[18] talked about heavy trucks. We talked about light
[19] trucks. We have got programs in there for
[20] photovoltaics and wind, and zero-net-energy houses.

[21] On the fossil side, we have got a Vision
[22] 21, which the Department has come up with for coal,

[1] because coal is a resource that is going to be used
[2] around the world simply because it is a resource
[3] that exists around the world, and the point there
[4] is, make it as efficient as possible and use it in
[5] a cogeneration application, as Michael has
[6] mentioned earlier.

[7] And in nuclear, both on the fission and
[8] the fusion side, we talk about aggressive programs.
[9] Fusion has got a longer time frame, but, even with
[10] fission, we need to look about—we need to look at
[11] advanced systems, systems which are
[12] proliferation-resistant because, let's face it,
[13] fission reactors are zero carbon emitters.

[14] There is one last point about how you
[15] complement the program, and the program that is in
[16] the PCAST report talks about an increase of about a
[17] billion dollars annually in the R&D budget, small
[18] potatoes from an insurance policy point of view,
[19] but there is a complement to that, and that is the
[20] commercialization aspect.

[21] Most R&D programs have a little triangle
[22] in the lower right which says it has now been

[1] proven, now just go out and commercialize. There
[2] is still a small hill to climb there, whether it is
[3] by Federal buy-down, cap and trade systems,
[4] auctions, renewable portfolio standards, things of
[5] these sorts, which will help buy down that initial
[6] high-priced energy technology and bring it into the
[7] commercial marketplace.

[8] The last slide talks about what some of
[9] the impacts could be in the mid to long term for
[10] selected energy technologies that we examined in
[11] the PCAST report.

[12] I apologize to all of you. You need to
[13] get a copy of the PCAST report, which will help
[14] reduce budget deficits, and you can look at in
[15] detail what we are talking about.

[16] What we have here on the bottom are what
[17] the costs would be on a net-present-value basis for
[18] selected technologies. The wedge is going up.
[19] Look at the potential impact, and it is a rather
[20] simplistic approach, but the potential impact in
[21] savings that could be realized by the introduction
[22] of those technologies, it is simplistic because it

[1] doesn't look at cross-competition from one
[2] technology to another. But it does show you that
[3] there can be significant reductions in CO2
[4] emissions by the introduction of these advanced
[5] technologies.

[6] It is an exciting time. Energy technology
[7] is an exciting area, and for the students in the
[8] audience, look forward to it as a career.

[9] Thank you.

[10] [Applause.]

[11] PRESIDENT CLINTON: Let me—we need to
[12] wrap up. We are running a little bit late, but I
[13] wanted to just give everyone an opportunity to
[14] comment on this.

[15] Mason was the only person who I think
[16] explicitly said that, in order to make this
[17] transition, we need to raise the price of
[18] carbon-based products.

[19] One of the difficulties we are having
[20] within the administration in reaching a proper
[21] judgment about what position to stake out in Kyoto
[22] relates to how various people are responding,

[1] frankly, to the recommendations and the findings of
[2] the people coming out of the energy labs because
[3] they say, hey, look, what we know already shows you
[4] that we have readily available technologies and
[5] courses of action, which would take a huge hunk out
[6] of-right now, with no great increased cost—a huge
[7] hunk out of any attempt to, let's say, flatten our
[8] greenhouse gas emissions at 1990 levels.

[9] We just head about it today. Look at what
[10] you can do. The powerplants, you can recapture the
[11] waste, two-thirds of that. You can make buildings
[12] and manufacturing facilities and residences much
[13] more energy efficient. You can make transportation
[14] much more energy efficient. Besides that, we have
[15] got all of these alternative sources of fuel for
[16] electricity and transportation. I mean, it is all
[17] out there. This is what we know now. Then, sooner
[18] or later, we are going to have the Partnership for
[19] a Next Generation Vehicle.

[20] So the question is always, though, who
[21] will buy this stuff. I mean, right now you can buy
[22] light bulbs. Every one of us could have every

[1] light bulb in our home right now, every single one
[2] of them. We would have to pay 60-percent more for
[3] the light bulb, but it would have three times the
[4] useful life. Therefore, you just work it out. It
[5] would literally—we'd pay more up front. We'd save
[6] more money in the long run, and we'd use a whole
[7] lot less carbon.

[8] And why don't we do it? Why do we have
[9] any other kind of light bulbs in our home? And
[10] that is the simplest example of the nature of the
[11] debate we are now having. That is, in order to get
[12] from here to where we want to go, do we have to
[13] either raise the price of the product—there are
[14] only three or four things you can do. You can
[15] raise the price of the product to the consumers.
[16] You can lower the price of the alternative thing
[17] you wish to be bought by the consumers. You can
[18] create some new business opportunity through some
[19] market-permit-trading, other market option, or
[20] otherwise change the business environment, the way
[21] we do electric deregulation, for example, or you
[22] can somehow increase the awareness of consumers of

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[1] what their options are and the consequences of that
[2] and hope that they will behave in a different way.
[3] I think those are the four categories of
[4] possibilities, and if you choose an ambitious
[5] target, then if the requirement is almost-to reach
[6] the target, it is almost exclusively on the front
[7] end, that is, you have to raise the price to the
[8] consumer or to the business involved--the
[9] businesses may be a consumer--if it happens too
[10] quickly, you're going to do economic damage on the
[11] one hand, and on the other hand, there's no way in
[12] the world this Senate will ratify our participation
[13] in Kyoto. So it will be out there to create it.
[14] It will be a grand gesture, but it won't happen.
[15] Therefore, we have got to know how much we
[16] can do through a combination of price. You might
[17] be able to get some price changes, particularly
[18] going back--Mike said this, too, on the real price
[19] of energy--particularly if it was not a net tax
[20] increase. You wouldn't have to have a net. There
[21] are a lot of other ways to do this, but we have to
[22] be able to get something out of either lowering the

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[1] cost to the alternative, creating new business
[2] markets, or increasing consumer awareness of what
[3] is right there for them now and what the
[4] consequences are.
[5] We can't do it all on the front end and
[6] expect realistically--if all we do on the consumer
[7] price index, raising the price of coal, raising the
[8] price of oil to the real consumer, and that is all
[9] we do, we are not going to get what we want to do
[10] in the time allotted to get it because it either
[11] won't pass the Senate or it won't pass muster with
[12] the American people.
[13] So we have to be able to access what the
[14] Energy Department tells us is there for all to see
[15] in other ways, and I don't know if any of you want
[16] to comment on that, but this is not a question of
[17] whether you are brave or not. It is really a
[18] question of what we can get done and what
[19] realistically is going to happen in America, but I
[20] am plagued by the example of the light bulb I read
[21] in my living room at the White House that I read
[22] under at night, and I ask myself why isn't every

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[1] light bulb in the White House like this.
[2] I use this one. I am pleased. I get so
[3] ticketed. I go in and turn it on, and I measure
[4] how much longer it takes to really light up, but I
[5] know it's going to be there long gone, you know.
[6] [Laughter.]
[7] PRESIDENT CLINTON: All of a sudden, it's
[8] a great thing, and I say why am I so irresponsible
[9] that I have not put this in every light bulb. Why
[10] are we not all doing this?
[11] So, when you get right down to it, now,
[12] this is where the rubber meets the road. We have
[13] to make a decision, a commitment. It has to be
[14] meaningful. I am convinced that the Energy
[15] Department and lab people are absolutely right, but
[16] the skeptics on my economic team said there will
[17] not be perfect substitution. They are not going to
[18] do it.
[19] So, if you want to say anything about
[20] that, you can, but, when you get right down to it,
[21] that's where all of these decisions are going to be
[22] made, based on our best judgment about what kind of

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[1] markets we can create for the private sectors, what
[2] kind of substitution there is, and whether we
[3] can--how quickly we can move to alternative energy
[4] sources that people will actually access.
[5] So you commented, and, Michael, you did.
[6] Does anybody else want to say anything else about
[7] this?
[8] MR. WILLRICH: [In progress] dollars and
[9] it created a whole market to figure out how to do
[10] it.
[11] I think we can come up with a way to say
[12] no more carbon and it's going to ratchet down.
[13] Then just let the market figure out ways to trade
[14] permits to get there. The model worked with
[15] sulfur. I think it can work here.
[16] PRESIDENT CLINTON: It worked superbly
[17] with sulfur.
[18] What do you say to the people who--we had
[19] a great debate. We argued this for an hour and a
[20] half in the Oval Office the other day. I probably
[21] shouldn't admit that. We did.
[22] [Laughter.]

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[1] PRESIDENT CLINTON: Anyway, you should
[2] feel good that we argue these things in good faith.
[3] That should give you confidence. You should feel
[4] good about this.
[5] [Applause.]
[6] PRESIDENT CLINTON: What is your answer to
[7] the attack on that or, at least, the counter that,
[8] sulfur was this big a problem and carbon was this
[9] big a problem and you're talking about a huge
[10] section of the economy and it will be much more
[11] difficult to construct and administer and see it
[12] work, a marketing system, a permeating system with
[13] carbon than it was with sulfur?
[14] MR. CASTEN: As an entrepreneur,
[15] Mr. President, I'm delighted because it's such a
[16] much bigger sector, that there's many more
[17] opportunities to find ways to block it.
[18] [Applause and laughter.]
[19] PRESIDENT CLINTON: That's what I said. I
[20] wish you had been there with us.
[21] [Laughter.]
[22] PRESIDENT CLINTON: Anybody else want to

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[1] comment on this?
[2] DR. PAPAY: No, I tend to agree with what
[3] Tom said. It does not have to be that large. I
[4] think the fear is that, you need hundreds and
[5] hundreds of dollars per ton of carbon. Actually,
[6] in fact, if you introduce it, you begin to send a
[7] signal and the fact is, the market will, although
[8] imperfect, will begin to work. You begin to see
[9] these advance technologies begin to come in behind.
[10] If there is no signal given, the market
[11] will be indifferent to it.
[12] VICE PRESIDENT GORE: If I could just add
[13] a brief point.
[14] We have all been struck by what has
[15] happened in the information industries with the
[16] introduction of microprocessors and the better
[17] understanding of how systems operate with the cost
[18] of microchips being cut in half and the power of
[19] microchips doubling every 18 months. And, of
[20] course, there was an announcement a few weeks ago
[21] where they now say, well, they think maybe it will
[22] go faster than that.

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[1] There are lots of companies where large
[2] groups of people who were organized just for the
[3] purpose of moving information around have been
[4] greatly affected by the fact that, now, with
[5] microprocessors, we can use information so much
[6] more efficiently that everything is different.
[7] Why isn't the same thing going to happen
[8] with energy that has happened with information?
[9] With the better understanding of systems, with the
[10] use of microprocessors in the flows of fuel and the
[11] flows of electricity--yes, sir?
[12] **DR. PAPAY:** The problem--and John
[13] mentioned it in the first panel. There is such an
[14] infrastructure built out there, buildings and
[15] industries and power plants and et cetera, even
[16] automobiles, what is the lifetime? We change out
[17] the information infrastructure in a three to five-year
[18] period. The energy infrastructure tends to
[19] work on a much longer time frame. So, if you don't
[20] affect it today, the ability to affect it in the
[21] future will be impeded simply because it becomes
[22] much more massive with time. It takes time to do

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[1] it. So, if you don't start now, if you delay, you
[2] delay and you're dealing with a larger problem
[3] because the rest of the world will continue to
[4] build using existing technologies.
[5] **DR. YEAGER:** If I might just add that, I
[6] think in what has been noted as an increasingly
[7] competitive environment, we need incentives or the
[8] prompt turnover of this capital stock rather than
[9] to necessarily let it run on indefinitely. Right
[10] now, the incentives are to run it indefinitely
[11] rather than to turn it over.
[12] Secondly, I think he have to remember that
[13] this problem needs to be done in a global context.
[14] We are really trying to solve what I call the
[15] trilemma of population, poverty and pollution on a
[16] global scale. It is a joint implementation, the
[17] ability to invest what are always going to be
[18] limited resources where we get the biggest bang for
[19] the buck, make the biggest difference in terms of
[20] improving quality of life create markets on a
[21] global scale. In short, to do well by doing good
[22] seems to me to be an important principle that we

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[1] ought to be carrying to the world.
[2] **PRESIDENT CLINTON:** I strongly agree with
[3] that and we're pushing that. Again, I say that
[4] does not let us off the hook to do things here at
[5] home. It just makes good sense. It's easier for
[6] these other--we should give these other countries a
[7] chance to choose an alternative path.
[8] I never will forget. A couple of years
[9] ago--and I know we have to wrap up. I had a
[10] fascinating conversation with the President of
[11] China a couple of years ago and we were discussing
[12] what our future would be and whether we wished to
[13] contain China. I said, I don't wish to contain
[14] China. I said, the biggest security threat that
[15] China presents to the United States is that you
[16] will insist on getting rich the same way we did.
[17] [Laughter.]
[18] **PRESIDENT CLINTON:** He looked at me and I
[19] could tell that he had never thought of that. I
[20] said, you have to choose a different future and we
[21] have to help. We have to support you. That does
[22] not in any way let us off the hook, but it just

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[1] means that we have to do this together.
[2] Well, this has been fascinating. You guys
[3] have been great and I thank you a lot.
[4] [Applause.]
[5] **MODERATOR:** Ladies and gentlemen, the
[6] breakout sessions will begin immediately in the
[7] Leary Center. Ushers will be downstairs and
[8] outside to direct you to the center. Your
[9] individual breakout groups are listed in your
[10] program. We will resume the afternoon session
[11] here, in Gaston Hall, at 2:10 p.m.
[12] [Recess.]
[13] **MODERATOR:** Ladies and gentlemen, please
[14] take your seats at this time.
[15] Ladies and gentlemen, the First Lady of
[16] the United States, accompanied by Ambassador Robert
[17] Gallucci, Dean of Georgetown's School of Foreign
[18] Service.
[19] [Applause.]
[20] **MR. GALLUCCI:** Mrs. Clinton, distinguished
[21] guests, distinguished panelists, ladies and
[22] gentlemen, good afternoon. I'm Bob Gallucci, Dean

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[1] of the Edmond A. Walsh School of Foreign Service at
[2] Georgetown University. On behalf of the faculty
[3] and the staff and the students, I'd like to welcome
[4] you this afternoon to Georgetown for the second
[5] session of the White House Conference on Global
[6] Climate Change.
[7] It is fitting, I think, that this
[8] conference would take place at Georgetown. An
[9] issue of this importance demands research,
[10] education, dialogue and that is what this
[11] university is all about. The school of Foreign
[12] Service is particularly about interdisciplinary
[13] study and the application of theory to practical
[14] problems, to the world of policy.
[15] Our Science and Technology in
[16] International Affairs Program seeks to prepare our
[17] students for the challenges and opportunities that
[18] await the next generation of leaders in the global
[19] community. Some of those students are here today
[20] and some of them, no doubt, will be called upon to
[21] confront the issues we are here today to discuss.
[22] If this morning's first panelist, John

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[1] Holdren, is right, then the world community faces a
[2] monumental challenge. Ultimately, what we are
[3] discussing here today is the issue of global
[4] security. Global security, when we used that term
[5] in the past, we could identify the enemy clearly.
[6] It was the other super power. Now, we fear that we
[7] may be dealing with a far less coherent threat.
[8] The immortal words of Pogo about an
[9] unpopular war in a far off land a long time ago
[10] have a haunting sound. "We have met the enemy," he
[11] said, "and they are us."
[12] I understand there has been a shift in the
[13] balcony and many of you were not here for the two
[14] panels this morning. I can assure you that, aside
[15] from remarks by President Clinton and Vice
[16] President Gore and presentations by some of the
[17] leading experts in the world on the subjects, you
[18] didn't miss much.
[19] [Laughter.]
[20] **MR. GALLUCCI:** The panels this morning
[21] were excellent and I think they have added much to
[22] the discussion about what may be one of the most

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[1] important issues facing humankind today, global
[2] warming. This afternoon's program is just as
[3] impressive. We will start with a presentation by
[4] one of America's most astute analysts and most
[5] effective advocates of social policy, the First
[6] Lady of the United States.

[7] After almost five years in the White House
[8] and 12 years as First Lady of Arkansas, Hillary
[9] Rodham Clinton has proven herself to be a tireless
[10] advocate for the less fortunate in society. She
[11] has fought for better treatment and cared for
[12] children with AIDS. She has helped developed
[13] pioneering in-home instruction programs for
[14] preschool youth. She has worked for better health
[15] coverage for all Americans. In these and many
[16] other initiatives, the First Lady has assumed a
[17] leading role in the struggle to improve the
[18] standards of living and the futures of children in
[19] the United States and throughout the world. That
[20] is why it is so important that she is here today as
[21] part of this forum.

[22] History teaches us that in times of pain

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[1] and want, children usually suffer first and suffer
[2] greatest.

[3] Once again, the First Lady is taking a
[4] leading role in protecting the interests of
[5] children by participating in the discussion of
[6] global climate change. We must study and
[7] understand this issue, work together and make
[8] decisions to preserve a healthy world for the
[9] generations that will inhabit this planet long
[10] after we are gone. The First Lady, through her
[11] courage, tenacity and grace, serves as a model for
[12] us all.

[13] Ladies and gentlemen, it is my pleasure
[14] and my privilege to introduce the First Lady of the
[15] United States, Hillary Rodham Clinton.

[16] [Applause.]

[17] MRS. CLINTON: Thank you, thank you very
[18] much. Thank you, Bob. Thank you, Father O'Donovan
[19] for once again welcoming all of us to Georgetown,
[20] which just happens to be my husband's alma mater.

[21] [Applause.]

[22] MRS. CLINTON: I particularly want to

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[1] thank all who are gathered here as participants and
[2] observers of this important conference. I am
[3] delighted that there are so many students and young
[4] people, because certainly there is no member in the
[5] audience with more at stake than those who are just
[6] beginning to look into their own futures and chart
[7] their own courses.

[8] I can think of no more fitting day for us
[9] to come together to discuss climate change than
[10] today, which has been designated as Children's
[11] Health Day in the United States since 1928. For
[12] all of those years, we have met every year, as I
[13] did again this morning at the White House, with
[14] people charged with the responsibility for looking
[15] after our children's health. Every year, we have
[16] evaluated how well we have done in dealing with
[17] those issues that most affect the well-being of our
[18] children.

[19] Our grade as a country went up this year
[20] from a C minus to a C. That's not much to brag
[21] about, but we are making progress and, at least,
[22] the trend line is in the right direction.

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[1] But, certainly, to meet today, on
[2] Children's Health Day, in the context of this
[3] conference is to put an even brighter spotlight on
[4] what is happening and could happen to our children
[5] if we refuse or fail to act appropriately, for how
[6] we act in response to global warming will have a
[7] profound impact on the safety and well-being of
[8] children not only here in our country, but the
[9] world over.

[10] One of the biggest threats children face
[11] is disease, particularly disease rooted in
[12] environmental causes. Millions of children under
[13] the age of five die every year from preventable,
[14] easily treated conditions like pneumonia, diarrhea,
[15] malaria and malnutrition. Thousands more are made
[16] sick from air pollution.

[17] In recent years, I have seen the
[18] individual faces behind these statistics, a boy
[19] feverish with malaria in Africa, a girl perilously
[20] malnourished in Asia, an infant dehydrated from
[21] cholera dying in South America, children in our own
[22] cities, suffering from asthma, struggling to

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[1] breathe. There is no escaping the fact that
[2] growing bodies are more susceptible to disease,
[3] pollution and environmental changes than the rest
[4] of us.

[5] And so, in a real way, it is for these
[6] children and millions more like them and those to
[7] come that bring us to this conference today
[8] because, as we have heard this morning from some of
[9] the world's leading scientists, the health problems
[10] that fall disproportionately on children are only
[11] going to get worse if we do not do something about
[12] climate change. So, I want to talk to you briefly
[13] this afternoon, not as a scientist or as someone
[14] prepared to recommend any specific policies,
[15] targets or timetables, but as a mother and a
[16] citizen with a longstanding concern for the health
[17] and safety of children.

[18] While uncertainties about the particulars
[19] of climate change remain, while we do not know
[20] exactly, for instance, how much and how fast
[21] temperatures will rise, this much is clear. Global
[22] warming has the power to put more children at risk.

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[1] Let me focus on three health flashpoints, air
[2] quality, the spread of disease and food security.

[3] One reason we should be increasingly
[4] concerned about global warming has to do with
[5] respiratory illnesses. Already as many as 40
[6] percent of children seen in health clinics around
[7] the world are suffering from acute respiratory
[8] infections. It is likely that an increase in
[9] global temperatures will deepen this problem.

[10] High pollution levels in many urban areas
[11] result in high levels of ozone and fine particulate
[12] matter. Studies tell us that, when these
[13] pollutants increase, the number of respiratory
[14] illnesses tend to rise, too. These pollutants can
[15] aggravate conditions like asthma. Over the last
[16] decade, the number of cases in asthma in the United
[17] States has jumped by 29 percent. Hospitalization
[18] rates have increased by six percent. The largest
[19] increases have been among children and young
[20] adults.

[21] Today, asthma affects nearly five million
[22] American children. Last year, it led to more than

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[1] 300 deaths. Children in urban areas are hit
[2] hardest. In New York City, for example, children
[3] are hospitalized at four times the national rate.
[4] Within the city itself, rates are three to five
[5] times higher for African-Americans and Latinos. A
[6] rise in temperature, it is thought, will likely
[7] hasten this trend.
[8] Children in disadvantaged neighborhoods,
[9] those least likely to seek quality medical care,
[10] will be affected the most, but not child will be
[11] entirely safe. I notice the increase in asthma as
[12] I travel from children's hospital to children's
[13] hospital and meet with long time pediatricians who
[14] tell me with concern about the numbers of children
[15] they now see and how difficult it is often to
[16] monitor their illness.
[17] Another reason we should be concerned with
[18] climate change has to do with the spread of
[19] infectious diseases. In 1995, infectious diseases,
[20] like malaria, cholera, dengue and yellow fever,
[21] killed more than 17 million people worldwide. Nine
[22] million of these deaths were children.

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[1] Increases in temperature hasten the spread
[2] of infectious diseases for two reasons. First,
[3] they shorten incubation periods. That means that
[4] the viruses, bacteria and parasites that cause
[5] these diseases can reproduce and spread a lot
[6] faster. Second, cool temperatures protect parts of
[7] the world from certain diseases. They serve as an
[8] important line of defense. Diseases that can
[9] survive in hot, humid Calcutta just aren't going to
[10] make it in Cleveland unless temperatures rise.
[11] Take a disease like malaria, which is
[12] spread primarily by mosquitoes. There are a half
[13] billion cases of malaria every year. In 1995, 2.1
[14] million of these resulted in death, most of them of
[15] children under the age of five. Moreover, the
[16] threat of malaria is increasing with the emergence
[17] of strains are resistant to drugs. In Africa, for
[18] example, the spread of Chloroquine-resistant
[19] malaria has contributed to an estimated two to
[20] threefold increase in malaria-related deaths since
[21] 1984.
[22] Those of you in business or government who

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[1] travel to Africa and Asia regularly, have been
[2] told, I am sure as I have by my doctor, that now
[3] taking malaria medication is absolutely a
[4] necessity, but whether or not it is good enough to
[5] withstand whatever strain is out there is an open
[6] question.
[7] For this reason, higher temperature should
[8] be a matter of real concern. Areas that were
[9] previously free of malaria mosquitoes, such as
[10] mountainous regions in Rwanda and Kenya, are now
[11] reporting an influx of the insects. In Costa Rica
[12] and Colombia, mosquitoes that were never seen above
[13] one thousand meters have been spotted at twice that
[14] altitude.
[15] The United States is not immune, as you
[16] saw from Diana Liverman's maps this morning. In
[17] fact, according to research by the United States
[18] Agency for International development, as a
[19] consequence of climate change, the percentage of
[20] the world's population at risk to malaria could
[21] increase from 45 percent to 60 percent, increasing
[22] the annual number of malaria cases by 50 to 80

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[1] million people per year.
[2] The spread of water-borne disease could
[3] also be hastened by climate change. Warmer water
[4] temperatures breed and sustain infectious bacteria.
[5] Flooding that results from rising sea levels could
[6] put water supplies at risk. This could make a bad
[7] problem worse. 1.3 billion people already lack
[8] access to safe water; 1.9 billion lack access to
[9] sanitation. Again, children are most imperiled.
[10] Unsafe water is the prime cause of the
[11] approximately three million childhood deaths
[12] annually, worldwide from diarrheal disease and the
[13] four million childhood deaths annually from
[14] pneumonia. In the developing world, diarrheal
[15] disease is the number one killer of children. Yet,
[16] I have visited some of the diarrheal clinics, most
[17] notably in Dakar and met American doctors there
[18] studying how low tech, cost-effective means could
[19] be used to treat diarrhea because they have seen it
[20] beginning to spread in places like Louisiana.
[21] Third and finally, climate change can put
[22] food security at risk. Scientists predict that, as

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[1] carbon dioxide levels rise in the atmosphere, one
[2] of the consequences will be a shift in the zones of
[3] agricultural productivity. That could result in
[4] changes in crop, livestock and fish farming
[5] productivity, reduced availability of water for
[6] irrigation and loss of arable land.
[7] These disruptions would likely cause local
[8] shortages of food supplies and the result would be
[9] hunger and malnutrition which would harm, in turn,
[10] children and pregnant women especially. To
[11] complicate matters, the countries most vulnerable
[12] to droughts and pest outbreaks and other factors,
[13] restricting food production are among the poorest
[14] in the world, places where widespread famine
[15] already takes a terrible human toll.
[16] In short, climate change, as you are
[17] discussing today, has the potential to deepen
[18] problems we already face, problems that fall
[19] disproportionately on our youngest citizens. For
[20] this reason, we should address climate change, not
[21] just as a scientific or economic issue, but also as
[22] a health and safety one that should concern all of

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[1] us.
[2] I know that, as parents, we think about
[3] our children. I believe that part of our
[4] obligation is to think not only about our children
[5] and grandchildren, but about all children. That
[6] certainly is how my husband sees it and part of his
[7] efforts to respond to global warming grow out of
[8] his overall agenda to build a strong foundation for
[9] the well-being of children.
[10] We have made real progress toward that
[11] end, with a balanced budget that will help extend
[12] health insurance to five million children, with a
[13] Medicaid program and active legislation like the
[14] Family and Medical Leave and the Kennedy and
[15] Kassebaum Acts, raising immunization rates, trying
[16] to shield our children from tobacco and drugs.
[17] The President has acted to see to it that
[18] our air, water and food are safe, by putting new
[19] standards on meats, seafood and poultry and signing
[20] a law to keep harmful pesticides off our fruits and
[21] vegetables. This summer, he put in place tough new
[22] air quality safeguards which will protect millions

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[1] of American children from the health effects caused
[2] by ozone and small particulates. Today's
[3] conference is part of the ongoing effort, not only
[4] of the President, but of all of us to safeguard the
[5] future of our youngest citizens.
[6] The Bible asks if your child asks for
[7] bread, would you give him a stone? If he asks for
[8] fish, would you give him a serpent? If he asks for
[9] an egg, would you give him a scorpion? These are
[10] the oldest questions in the world and they remind
[11] us of the duties faced by every generation to see
[12] to it that, when our children, even before they're
[13] able to ask for themselves, are really asking us to
[14] make sure they have as healthy and safe an
[15] upbringing as possible by enabling them to inherit
[16] a world at least as good if not better than the one
[17] they came into.
[18] Those questions also need to be on the
[19] agenda in discussing climate change, because the
[20] people who will be most affected are not here.
[21] They will not be in any of the rooms or any of the
[22] breakout sessions. They won't be able to follow

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[1] the very detailed discussions led by our panelists.
[2] They have a lot at stake and we should be sure that
[3] the questions they ask us are ones that we will be
[4] proud to answer in the future.
[5] Thank you very much.
[6] [Applause.]
[7] MODERATOR: We will now have a very short
[8] hold while the Vice President comes back into the
[9] building.
[10] [Pause.]
[11] [Applause.]
[12] VICE PRESIDENT GORE: Thank you very much.
[13] Thank you so much.
[14] I hope everyone had a good lunch and I
[15] want to thank the First Lady for her comments. I
[16] want to move right into the third panel.
[17] It is my great honor to introduce for the
[18] first comments, my colleague in the President's
[19] cabinet who, in my opinion, is a real superstar
[20] around the world and in our country. It is a great
[21] joy to work with our Secretary of State. On this
[22] issue, it has been particularly enjoyable to have

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[1] someone with her commitment and understanding
[2] involved in this, as she has been.
[3] We will introduce the other members of
[4] this panel after the Secretary of State makes her
[5] comments.
[6] Madam Secretary, thank you very much and
[7] please proceed.
[8] SECRETARY ALBRIGHT: Thank you very much,
[9] Mr. Vice President and it is a real pleasure to be
[10] here with you on this occasion, on a subject that
[11] you have been talking about for a very long time
[12] and that we are all more and more aware of as the
[13] hours progress.
[14] Let me just say, when I was a professor
[15] here in the '80s, which I dearly loved and sat in
[16] this room--
[17] [Applause.]
[18] SECRETARY ALBRIGHT: Maybe you all will
[19] have me back.
[20] Let me say that, the students that I had
[21] used to listen to me on a regular basis make the
[22] following kind of statement, which was that as we

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[1] were looking at what national security threats were
[2] and would be, I used to say, when the last time I
[3] looked, the United States was still behind two
[4] oceans, safely protected from missiles and various
[5] armed attacks, but there were other threats that we
[6] were less aware of and less capable of dealing
[7] with.
[8] We had the most porous borders to the
[9] north and south and also porous borders from top
[10] and bottom and that we really did have to be
[11] concerned about what were threats to American
[12] national security from climate. It was kind of
[13] weird thing to say in the 1980s and a lot of
[14] students wondered what I was talking about.
[15] We did begin to think about how the
[16] curriculum here could be changed so that students
[17] would become more aware of how to deal with these
[18] kinds of threats and how to study about them and
[19] how to work with them and to protect the United
[20] States. So, it seems particularly appropriate to
[21] be here with this very illustrious group talking
[22] about climate change and disruptions and how it

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[1] affects the United States and the entire world.
[2] We do know from your various speakers this
[3] morning what is going on. I won't repeat that in
[4] my non-scientific way, but clearly the impact of
[5] what is happening is global and it must be
[6] addressed on a global basis and we must act and so
[7] must others. But to do so effectively, we need to
[8] develop a consensus on what to do, how and when to
[9] do it and by whom it should be done.
[10] Our efforts begin with the United Nations'
[11] Framework Convention on Climate Change open for
[12] signature at the 1992 Rio Summit, a convention that
[13] the United States was the fourth country and first
[14] developed nation to ratify. Two years ago in
[15] Berlin, the parties to that convention recognized
[16] that we were not doing enough under the Framework
[17] Convention to meet its goal of stabilizing the
[18] emission of greenhouse gases.
[19] In Berlin, we adopted a mandate for talks
[20] that would lead to tangible steps taken by
[21] developed countries and continued consideration by
[22] developing countries. A year later, in Geneva, the

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[1] United States led an achieving agreement that such
[2] commitments be binding. The talks will reach their
[3] conclusion in Kyoto, Japan this December.
[4] Although this process has generated
[5] momentum toward concerted international action and
[6] created a greater level of public awareness, the
[7] job of building a consensus is far from complete.
[8] The consensus we need must be domestic. It must
[9] extend to others in the industrialized world and it
[10] must become the basis for a common approach between
[11] developed and developing nations. The consensus at
[12] home must be founded on a recognition of strong
[13] scientific evidence that global climate change is
[14] occurring and will have harmful effects. It must
[15] rest on confidence that our leadership is high
[16] technology and industrial innovation will allow us
[17] to adjust to emission limits without losing our
[18] competitive edge, and it is dependent on an
[19] assurance that other countries, including those in
[20] the developing world will do their fair share in
[21] meeting the challenge.
[22] The consensus among the industrialized

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[1] nations must grow from the understanding that this
[2] is a serious issue, requiring a serious response.
[3] Solutions will come through a long term process,
[4] not a popularity contest. It does no good to pay
[5] lip service to unreachable targets. At the end of
[6] the day, we will be judged not by the targets we
[7] set, but by the standards we reach.
[8] The consensus between developed and
[9] developing nations will be the most difficult to
[10] achieve. We're not there yet. We must begin with
[11] the understanding that responsibilities are mutual
[12] even if not identical. The United States, as we
[13] have now heard many times, has four percent of the
[14] world's population and we do emit 20 percent of the
[15] greenhouse gases. Clearly, we and other major
[16] emitters must take the first step. But if the
[17] major emerging economies of the developing world do
[18] not accept their responsibility to follow, we will
[19] not achieve consensus and we will never solve our
[20] shared problem.
[21] To move toward this triple consensus, we
[22] need proposals that are unifying, not divisive,

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[1] both within the United States and in the community
[2] of nations. The administration's approach is based
[3] on the view that all countries have the same
[4] interests because we're all in the same boat in
[5] minimizing the harmful impact of global climate
[6] change. Every nation contributes to the problem.
[7] Every nation will benefit from a strong response.
[8] Accordingly, an agreement should bind each
[9] to terms that are effective, appropriate and fair.
[10] We have already proposed and will work to put in
[11] place measures that support innovation such as
[12] trading or selling emission rights, measures that
[13] encourage technological development and measures
[14] that reward a country for the assistance it
[15] provides to another.
[16] Finally, we're looking for a time frame
[17] that is not so short as to be unachievable and not
[18] so long as to dilute effectiveness. We want the
[19] flexibility to develop strategies for
[20] implementation that will allow us to take advantage
[21] of technological advances and new insights into the
[22] science of global climate change.

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[1] So, in response to some of the television
[2] commercials that have aired recently let me say
[3] that the United States is interested in a proposal
[4] that will be global and that will work. This
[5] afternoon, we have brought together seven
[6] distinguished panelists to spur new exchanges and
[7] creative thinking on three aspects of the challenge
[8] we face in building U. S. leadership for an
[9] effective response to climate change.
[10] How do we insure meaningful and equitable
[11] and participation from a range of countries in the
[12] face of growing energy needs and expanding
[13] technological possibilities? What challenges will
[14] developing countries face in attempting to limit
[15] greenhouse gas emissions and how we can work with
[16] them to meet those challenges and what steps can we
[17] take to build the kind of consensus that I have
[18] discussed between developed and developing
[19] countries regarding the need for addressing this
[20] problem on the basis of mutual interests and mutual
[21] responsibilities?
[22] And now let me introduce our panelists.

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[1] Jessica Mathews, President of the Carnegie
[2] Endowment for International Peace; Richard
[3] Schmalensee, Director of MIT's Center for Energy
[4] and Environmental Policy Research and former member
[5] of the Council of Economic Advisors; James
[6] Wolfensohn, President of the World Bank; Daniel
[7] Yergin, President of the Cambridge Energy Research
[8] Associates and Pulitzer Prize winning author; Mae
[9] Jemison, head of the Jemison Institute of Advancing
[10] Technology in Developing Countries and a former
[11] astronaut; E. Linn Draper, Chairman and CEO of
[12] American Electric Power and Fred Krupp, Executive
[13] Director of the Environmental Defense Fund.
[14] Now, let me turn to a fellow panelist, who
[15] is a person, as I have said earlier, who is the
[16] driving force of those of us that have cared about
[17] climate change and someone who is the embodiment of
[18] what needs to be done as we move into the 21st
[19] century, my very good friend, the Vice President of
[20] the United States.
[21] **VICE PRESIDENT GORE:** Thank you very much.
[22] Good job, Madam Secretary.

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[1] [Applause.]
[2] **VICE PRESIDENT GORE:** Thank you, Madam
[3] Secretary, thank you very much for that very
[4] concise overview of where we stand now on the eve
[5] of this international negotiation.
[6] I'm going to turn right now to Jim
[7] Wolfensohn, President of the World Bank.
[8] As we heard this morning and as was clear
[9] from the Secretary of State's comments, one of the
[10] central questions the world has to deal with in
[11] grappling with this issue is the relationship
[12] between the developed countries and the developing
[13] countries.
[14] In your comments, Jim, if you could touch
[15] on what the developing countries have at stake in
[16] solving this or not solving it and what it means to
[17] them to have it done in a way that does not
[18] threaten the economic vitality of the developed
[19] countries.
[20] **MR. WOLFENSOHN:** Thank you very much,
[21] Mr. Vice President and Madam Secretary.
[22] I think I have three minutes to represent

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[1] 4.7 billion people.
[2] [Laughter.]
[3] **MR. WOLFENSOHN:** That doesn't give me a
[4] lot of time per person.
[5] Let me say, first of all, that I think
[6] everybody agrees in the developing world on the
[7] science, that there is a problem and it needs to be
[8] solved and the developing world is the place it
[9] gets hit most. Climate change affects the poor the
[10] most. As the First Lady said earlier, vector-borne
[11] diseases affect the poor. Water affects the poor.
[12] I won't chronicle those issues which affect those
[13] in marginal areas, but let me say that it affects
[14] very much our thinking on development.
[15] The issue of development is an issue which
[16] is of importance to the developing world, but let
[17] me respond, Mr. Vice President and say, it's an
[18] issue for all of us. It represents 40 percent of
[19] our exports. In just a few years, the five major
[20] countries in this world, India, Indonesia, Brazil
[21] and China, will represent not eight percent but 18
[22] percent of the world's GDP and that is integral to

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[1] our own activities.

[2] It is not something which is separate, so

[3] when I talk about the developing world, let us not

[4] think this is something we can decide on separate

[5] from our own thinking. It is a problem that is

[6] integral to ourselves. We breathe the same air.

[7] We have the same problems. We have the same

[8] immigration issues. We have the same trade issues.

[9] What happens in the developing world is an issue

[10] for us. It is not just an issue for the developing

[11] world.

[12] Looking at the developing world, what we

[13] see is a world that has not created this problem.

[14] It is a problem that has been created by the

[15] developed world. And so, from the point of view of

[16] our clients, they look at this issue and say, yes,

[17] it's a real problem, but why is it a problem that

[18] we have to solve. Well, the answer that they come

[19] up with and that they have come up with repeatedly

[20] in all the international arrangement is that, they

[21] are happy to have common but differentiated

[22] responsibilities. That is the phrase that has been

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[1] used in all the treaties.

[2] So, the developing world is not seeking to

[3] exclude itself from responsibilities. It is a

[4] question, as the President said this morning, of

[5] when and how. That is an issue of equity. That is

[6] an issue which we need to face in terms of

[7] development, because we're already facing up to the

[8] problem of how can we assist the developing world

[9] reach a level where it can be an economic force and

[10] where we can have both peace and stability.

[11] I remind you that, there are two billion

[12] people that live under two dollars a day. There

[13] are a billion, three hundred million people that

[14] live under a dollar a day. There are two billion

[15] people who don't have access to electric power and,

[16] therefore, burn fossil fuels which themselves

[17] affect the atmosphere. This is not a trivial

[18] issue. Ninety million people are being added to

[19] that number every year.

[20] So, it is an issue which is of importance,

[21] somewhere where there are already inadequate

[22] resources to bring that group into a level of

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[1] equity in the world. Without a level of equity,

[2] you cannot have peace and stability. And you

[3] cannot have trade and you cannot have a world that

[4] for your children is going to be viable and stable.

[5] Now, let me respond to one other aspect.

[6] We talk about the cost, the cost we are looking at

[7] in terms of the morning advertisements, in terms of

[8] generally accepted accounting principles.

[9] But what is not included in the cost is

[10] the cost in terms of future costs, the cost in

[11] terms of the erosion of our environment, the cost

[12] to our children. What use is it to have a profit

[13] today if our children and our grandchildren will

[14] not have an environment in which they can live?

[15] And so, the decision for us as leaders is

[16] a decision of how it is in both the developed and

[17] developing world that we can confront the issue of

[18] carbon emissions and a global environment. That is

[19] not something that can be dealt with by simple

[20] current accounting principles. It is a question

[21] which the President and the Vice President are

[22] focusing on. It's a question of leadership.

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[1] What the developing world is looking for

[2] is an issue of leadership by the developed world to

[3] take the steps that will allow the developing world

[4] to certainly conform as they go down the line, to

[5] participate as they go down the line, but be given

[6] the necessary breathing space in which they can get

[7] their house in order and where they can reach a

[8] certain minimum level of viability. That is an

[9] issue that the World Bank is assisting in, and

[10] which the United States is assisting in and other

[11] donor governments are working.

[12] This is an issue of development. It's an

[13] issue of poverty. It's an issue of equity. It's

[14] an issue of morality. I believe that, by having

[15] this conference, we are focusing on an issue that

[16] is not just of importance to those 4.7 or three

[17] billion or 1.2 billion people. It is a problem

[18] that is of importance to every one of us.

[19] VICE PRESIDENT GORE: Thank you very much.

[20] [Applause.]

[21] VICE PRESIDENT GORE: Thank you very much,

[22] Jim. Really good comments. I am hoping that at

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[1] the end of this panel, we will have time to come

[2] back and explore some further questions.

[3] Yet, I want to turn right now to Professor

[4] Richard Schmalensee, Professor of Economics at MIT,

[5] former member of the Council of Economic Advisors.

[6] On this question of developing country

[7] participation, what are your views?

[8] PROFESSOR SCHMALENSEE: Mr. Vice President

[9] and Madam Secretary, I think the developing

[10] countries have a critical role to play,

[11] particularly if you think about this problem in its

[12] long run aspect. A couple of slides that John

[13] Holdren used this morning, I think, illustrate that

[14] point nicely and one of them will appear, I'm sure.

[15] [Laughter.]

[16] PROFESSOR SCHMALENSEE: Maybe not.

[17] If you recall the slide contrasting

[18] business as usual emissions with the global

[19] emissions, with global emission levels necessary to

[20] stabilize atmospheric concentrations, the one

[21] before that, actually, stabilizing atmospheric

[22] concentrations called for a dramatic reduction in

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[1] global CO2 emissions, the green path versus the

[2] ascending path.

[3] The ascending path has in it improvements

[4] in energy efficiency at sort of historic rates.

[5] The green path calls for a dramatic transformation.

[6] That will require new technology. That will

[7] require, I believe experience makes clear, sharp

[8] increases in the price of energy.

[9] The second slide that John used this

[10] morning, makes clear that developing countries will

[11] have to participate and play a central role in any

[12] such transformation, simply because they are the

[13] locus--there is the slide--of emissions growth.

[14] Even cutting developed country emissions to zero

[15] will not suffice to follow that green path, unless

[16] the developing world also acts.

[17] The third factor is, it is unrealistic, I

[18] believe, to expect developing countries to devote

[19] significant resources of their own to this issue,

[20] given all of the immediate problems they face. We

[21] need to think about separating what is done where

[22] from who pays for it.

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[1] Now, with this sort of long run
[2] perspective, obviously investment in technology has
[3] a critical role to play, but so, I believe does
[4] strategic choice and investments in institutions.
[5] As I look at, at least, some of the
[6] rhetoric in the current negotiations, it envisions
[7] a sequence where the developed world makes sharp
[8] reductions in emissions and the developing world
[9] then follows, a deep then broad architecture, if
[10] you will. The problem with that--there are two
[11] problems. First, it doesn't attend to the problem
[12] of resource transfer, the problems of institutional
[13] development necessary to include the developing
[14] world fully. It postpones those difficult issues.
[15] Secondly and, perhaps more importantly,
[16] reducing emissions in the developed world,
[17] particularly by raising the price of energy in the
[18] wealthy countries, will induce migration of energy-intensive
[19] industry to the developing world. It
[20] will tend to lower world energy prices faced by
[21] developing countries. It will, therefore, tend to
[22] make it more difficult later for those countries to

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[1] join in any global effort if, indeed, we need to
[2] make significant transformations of the global
[3] economy.
[4] Therefore, I applaud all the discussion
[5] today of including the developing world initially
[6] and I think it's strategically critical that the
[7] developing world be on the train as it leaves the
[8] station; that we worry more about that than about
[9] how fast the train departs the station.
[10] Thank you.
[11] VICE PRESIDENT GORE: Thank you very much.
[12] [Applause.]
[13] SECRETARY ALBRIGHT: Yes, let me now carry
[14] on from the question of how the developing world
[15] grows. We have heard an awful lot about how
[16] developing countries have to take our commitments.
[17] Dr. Yergin, I wanted to address this to
[18] you, to find out how we can allow the developing
[19] world to grow and what are their energy needs. Of
[20] the energy options open to them, which are the most
[21] likely to help them reduce greenhouse gases?
[22] Because if they are going to grow, they clearly

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[1] will in some way have to be able to fuel their
[2] growth.
[3] DR. YERGIN: Madam Secretary, Mr. Vice
[4] President, ladies and gentlemen, thank you. Thank
[5] you for the question.
[6] Listening to the superb and very
[7] thoughtful discussion this morning, I really come
[8] away with the sense that the essential challenge
[9] is, how do you integrate these global climate
[10] change questions with rapidly growing energy
[11] consumption. And it is going to grow fast. By the
[12] year 2010, 13 years away, we're looking at
[13] consumption that may be 35 percent higher than it
[14] is today, most of that growth coming from the
[15] developing countries, Asia and Latin America.
[16] As the President said, it is the result of
[17] good things, higher economic growth, higher
[18] standards of living, free markets, freer trade.
[19] That then puts a question for the developing
[20] countries. I think that there is no question that
[21] they are environmental conscious. They can't avoid
[22] it. It's brought home to them.

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[1] You know, the devastating impact of the
[2] haze in Southeast Asia really makes it clear. The
[3] media calls it a haze, but it's really like being
[4] next door to a burning house. It's terrible.
[5] But the developing countries do see the--
[6] DR. YERGIN: [In progress] environmental
[7] policies is markets. Markets work, market-oriented
[8] systems bring things faster in surprising ways,
[9] more innovation, solutions, they deliver results.
[10] And I think there has been a recurrent tendency to
[11] underestimate the possibilities of technological
[12] change.
[13] We can look at what is happening in the
[14] energy field and we see it's happening: Highly
[15] efficient natural gas use, dispersed power, more
[16] efficient combustion of coal and, of course, lots
[17] of things in terms of efficiency.
[18] But the challenge, of course, is how to
[19] bring about cost-effective development and
[20] dispersion in a sensible way but I think we can say
[21] there that the developing countries certainly want
[22] to have 21st century technology rather than 20th

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[1] century technology if the can afford it.
[2] The other thing that can make a big impact
[3] soon is here today. That is natural gas which has
[4] a lot of, does much better in terms of carbon
[5] emission than other fuels. The trends are very
[6] favorable.
[7] You have a big resource base that is
[8] growing, you have a global gas business, technology
[9] is having a big impact but we have to think
[10] differently. We have to see the potential and the
[11] potential is very large in terms of the growth of
[12] electric power in Asia and Latin America.
[13] When we look at it we see that the
[14] potential is much greater than people think but it
[15] involves large cross-border projects. So, you need
[16] to strive to overcome the obstacles, build
[17] confidence, conviction and mutual dependence. And
[18] here is where you can have an impact at the very
[19] heart of growing world energy demand.
[20] You know, when you get to Kyoto, you are
[21] going to hear from the Europeans who will be
[22] speaking from a very high moral ground about what

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[1] they are achieving. How have they done it?
[2] They've done it by creating this great natural gas
[3] system that takes gas from Siberia, from the North
[4] Sea and North Africa and moves it into Europe.
[5] Well, if we want to see an impact in the
[6] region of fastest growing energy consumption we
[7] have to envision another system that takes the
[8] Caspian, Central Asia, South Asia, India, Southeast
[9] Asia up into China, Korea, Japan, Siberia, a new
[10] natural gas system. And in terms of global climate
[11] change, the type of things we've been looking at on
[12] those screens, the sooner we do that, the better.
[13] There will be many benefits from an integrated
[14] energy Asian natural gas system that will respond
[15] to your question from tying economies together,
[16] building cooperation, affording a platform for
[17] growth, helping to assure electricity for
[18] hospitals, schools and factories and addressing
[19] directly and in a very positive way the issue of
[20] global climate change.
[21] SECRETARY ALBRIGHT: Thank you.
[22] [Applause.]

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[1] VICE PRESIDENT GORE: Could I just, before
[2] you call on the next speaker, I just wanted to make
[3] a brief comment. When you talked about the
[4] Europeans speaking from a high moral platform and
[5] you referred to the Siberian gas and North Sea gas,
[6] it's also the fact, is it not, that the common
[7] reference to the 1990 base year means that
[8] countries such as Germany anticipate being measured
[9] against the last year when the most inefficient,
[10] most highly-polluting industrial plants in the
[11] entire world were spewing out CO2 and other
[12] pollutants from East Germany. And when they were
[13] shut down and newer technologies were adopted
[14] instead, it's very easy for them to meet that base.
[15] I mean they've also done some things that
[16] we haven't been willing to do and it's not all
[17] attributable to that. But it is kind of a freebie
[18] for them in some respects.
[19] DR. YERGIN: Yes, it's a big bonus.
[20] VICE PRESIDENT GORE: And similarly, the
[21] base year for Great Britain includes the period
[22] just before the great upheaval that former Prime

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[1] Minister Thatcher brought about in the British coal
[2] industry and just before the big substitution of
[3] natural gas for coal. So, to some extent, it's a
[4] freebie for them, too, isn't that right?
[5] DR. YERGIN: Absolutely. And they moved
[6] in gas to fill the void of coal.
[7] VICE PRESIDENT GORE: And, again, they've
[8] done some things, in addition to that, that we have
[9] not been willing to do, so, they deserve credit for
[10] what they have done. But the degree of difficulty
[11] for them is different. If this were an Olympic
[12] diving event, they would not have a high degree of
[13] difficulty assigned to their performance.
[14] [Laughter.]
[15] VICE PRESIDENT GORE: But, anyway, excuse
[16] me.
[17] [Laughter.]
[18] SECRETARY ALBRIGHT: We've all watched
[19] those.
[20] Dr. Jemison, you have done a lot of work
[21] on getting sustainable technologies to developing
[22] countries. Can these economies grow sustainably

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[1] and how can sustainable energy programs help the
[2] world's poorest inhabitants?
[3] DR. JEMISON: Thank you, Secretary
[4] Albright and Vice President Gore. That's a great
[5] question for me because the first thing I want to
[6] say is, yes, the economies can grow and in a
[7] sustainable way. But to put that in a framework, I
[8] think the first thing I need to do is just say that
[9] sustainable development is improving the quality of
[10] human life now in such a way that the ability of
[11] future generations to grow and develop are not
[12] compromised. So, that's what we are looking at.
[13] And let me put a face also on development
[14] in several different countries. We first go to
[15] Thailand where a photovoltaics plant has been
[16] providing energy to a rural area but, yet, next to
[17] it is a growing stack of car batteries, lead-acetate car
[18] batteries because that's the only way
[19] energy is stored.
[20] We go to South Africa where a grandmother
[21] is preparing a meal inside her house in a shanty-town; yet,
[22] there's a cooker, an electric cooker

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[1] that has recently been connected next to it where
[2] her granddaughter is coughing.
[3] And then if we go to Houston, Texas, where
[4] I am from, we see Jed fueling up his new super-duper, four-
[5] wheel drive vehicle with 23-gallons of
[6] gasoline that costs \$1.32. The commonalities here
[7] are striking because we are looking at
[8] unsustainable development and innovative or new
[9] technologies, the technologies that individuals
[10] have acquired, and they acquired this technology
[11] because it was their aspiration. They were
[12] fulfilling their own individual needs and desires.
[13] So, what we have to understand is when we
[14] talk about sustainable development we have to take
[15] into account and address not just public policy and
[16] national policy but what individuals want to do
[17] because that's going to be the driving force for
[18] development.
[19] We have already heard this morning quite a
[20] bit about emission standards for developing
[21] countries versus developed countries. But let me
[22] add a little additional context. More than 3

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[1] billion people worldwide live in the rural areas of
[2] developing countries and 75 percent of the energy
[3] use in these areas come from noncommercial sources
[4] of fuel, which means firewood, animal manure and
[5] agricultural byproducts.
[6] These are not counted in the market place,
[7] yet, this is what is providing the energy source
[8] for around 70 percent of the world's population.
[9] And, so, yes, providing sustainable energy
[10] could have a very strong effect on their lives as
[11] well as ours here in the United States and around
[12] the world. How can sustainable energy development
[13] help? It can help, first of all, by increasing
[14] agricultural production, through water pumps and
[15] irrigation. It can help by enhancing
[16] telecommunications because now you can get
[17] information back and forth, whether it is
[18] information on when to take goods to the market
[19] place or if it's information on distance learning.
[20] We can improve transportation in getting goods to
[21] markets. We can improve clean water and, thereby,
[22] limit the number of diarrheal diseases and other

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[1] water-borne diseases. We can bring support
[2] services into the area by health clinics, education
[3] and we can slow rural to urban migration.
[4] And the way that this happens and what we
[5] can do to help this is by changing the paradigm in
[6] which we are trying to supply power, not looking at
[7] centralized power production but rather looking at
[8] decentralized power production and alternative
[9] types of energy.
[10] So, if you can take a solar photovoltaics
[11] panel into rural areas then you can use that and if
[12] you can also use mini-hydro power. There are a
[13] number of ways to do it but the most important
[14] thing is to decentralize power production because
[15] it allows rural areas to grow and develop.
[16] The last thing I want to add is we have
[17] been talking about why we should be doing
[18] sustainable development, sustainable energy
[19] production, and most of the time we have talked
[20] about economies and whether it is good for health
[21] and safety but the one area I think we have left
[22] out is our human responsibility to each other and

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[1] to our future. That's the reason to do it, as
[2] well.
[3] [Applause.]
[4] VICE PRESIDENT GORE: Thank you, Dr.
[5] Jemison, very, very impressive presentation.
[6] I would like to call now on two panelists
[7] back-to-back, Dr. E. Linn Draper, who is President
[8] of American Electric Power, one of the largest U.S.
[9] power utilities and also, Fred Krupp, who is
[10] President of the Environmental Defense Fund.
[11] And I would like both of you, if you
[12] would, to discuss flexibility measures, including
[13] some of the ones that have been touched upon
[14] already like emissions trading rights nationally
[15] and internationally, and the subject of joint
[16] implementation where countries enter into
[17] partnerships and reductions in one place are the
[18] result of combined work by companies and others in
[19] different countries.
[20] We often talk about getting an agreement
[21] at Kyoto that includes flexible market-based
[22] mechanisms such as joint implementation and

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[1] trading. So, maybe we ought to spend a little time
[2] talking about how they work.
[3] If you could go first, Mr. Draper, and
[4] then you, Fred Krupp.
[5] DR. DRAPER: Thank you, Mr. Vice
[6] President, and you, Madam Secretary. We heard a
[7] lot this morning about the potential consequences
[8] of global climate change and we heard some about
[9] the technologies that could be used to reduce those
[10] effects. It seems to me that what we really need
[11] to talk about is what actions can be taken to
[12] ensure that these techniques are deployed.
[13] It seems to me there are two relatively
[14] simple things at least in concept that need to be
[15] done. One is to devise a system that encourages
[16] early action and the second, recognizing that this
[17] is a global problem, encourages action to be taken
[18] where it can be done most cost effectively, whether
[19] it is in the country in which the business normally
[20] resides or whether it can be done somewhere else.
[21] It is quite clear that the cost of
[22] implementation and deployment of these various

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[1] technologies is not the same around the globe and
[2] if we can deploy the technologies in other
[3] countries more cheaply than we can in the United
[4] States then it seems to me that it is in everyone's
[5] best interest to do that. It is good for the
[6] globe, it is good for the country to which the
[7] technology is transferred and it is good for the
[8] United States whose technology is being used
[9] elsewhere, it will provide employment both here and
[10] abroad.
[11] We have at the moment some 26 projects
[12] that are approved joint implementation projects.
[13] Joint implementation, as the Vice President said,
[14] is a project that is deployed in another country
[15] for which credit will ultimately be given. These
[16] 26 projects are of a variety of types. They
[17] include renewable energy, fuel switching, energy
[18] efficiency, land use projects and the like, and
[19] it's clear that they are effective.
[20] One of things that people are concerned
[21] about is that early actions before the rules are
[22] established will not be given credit and if things

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[1] are done abroad, adequate will not be given. If we
[2] can devise a system that will give assurance that
[3] credit will be given for these early actions,
[4] wherever they occur in the world, then I can assure
[5] you that more than 26 projects will soon exist.
[6] These 26 projects have been quite
[7] successful. They will sequester 180 million metric
[8] tons of carbon dioxide at a cost of \$515 million.
[9] That is very cost effective compared to what could
[10] be done in the United States.
[11] My company and a number of others are
[12] involved in one in Bolivia. It is the largest
[13] joint implementation project in the world and, Mr.
[14] Vice President, you will recall about a year ago
[15] you were in Bolivia to participate in that signing
[16] ceremony. It is called the Noel Kemoff Mercado
[17] Climate Action Project.
[18] It is a program to sequester carbon
[19] dioxide in the forests of Bolivia. The money was
[20] used to expand a national park. The expansion,
[21] alone, is bigger than the Yellowstone National
[22] Park. It is a huge geographic area. Over its

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[1] lifetime of 30 years it will sequester 53 million
[2] metric tons of carbon dioxide at a cost of 37 cents
[3] a ton. It is incredibly cost effective.
[4] If we could duplicate projects like that
[5] around the globe we would take a long step toward
[6] solving the problem that we are discussing, but it
[7] requires a system to be constructed that will give
[8] credit for early action and credit regardless of
[9] where that action is taken.
[10] Many of these projects, such as the one
[11] that I described that my company participates in,
[12] has other benefits as well. This particular area
[13] is one of unusual flora and fauna. It will
[14] preserve the natural habitat for exotic species,
[15] both of plants and animals. So, you not only get
[16] the benefit of reduction of carbon in the
[17] atmosphere but there are clearly ancillary benefits
[18] such as eco-tourism, preservation of wildlife and
[19] the like.
[20] And it seems to me that if we are smart
[21] enough to devise the right scheme to allow early
[22] credit to be taken and credit taken wherever we

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[1] take the action in the globe, you will see an
[2] enormous outpouring of voluntary activity.
[3] VICE PRESIDENT GORE: Great. Thank you
[4] very much.
[5] [Applause.]
[6] MR. KRUPP: Well, Mr. Vice President, I
[7] couldn't agree more with Linn Draper on the
[8] importance of early action. It is refreshing to
[9] have the head of an environmental group and the
[10] head of a major utility agreeing on that point.
[11] It's critically important for the environment and
[12] also important for the economy.
[13] You know, Madam Secretary, you said at the
[14] outset that we have to make sure that we have
[15] targets that are not just lip-service and they have
[16] to be combined with a workable plan. And the plan
[17] that the United States has come up with provides
[18] for a very effective way to cut greenhouse gases
[19] because what it does is it incorporates a lot of
[20] things that we heard this morning.
[21] For one it is a plan that allows us to
[22] save money. It's a plan that will spur new

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Page 199 [1] technology and the third thing it will do, that we [2] have all agreed is important, is it is a way to [3] draw in developing countries. [4] Let me explain. The Administration's [5] proposal would achieve these goals by creating a [6] market for greenhouse gas cleanup. It would [7] provide incentives, therefore, for cost reductions, [8] for new technologies, and for the developing [9] countries to participate. [10] It would do this by setting up a budget [11] for each nation. Each nation could emit a certain [12] amount of pollution over a certain budget period, [13] let's say, ten years. Any country that emits less [14] would earn a savings that it could then sell to [15] other countries who could emit more. [16] Overall, though, the total greenhouse gas [17] emissions would be limited to the budget amounts. [18] And what this would do would be to give countries [19] and individuals the financial reasons to reduce [20] emissions so that they would be earning credits. [21] During a budget period, companies that [22] invest in pollution control opportunities in	Page 202 [1] I just wanted to briefly say, on behalf of [2] the President and myself, this concept of credit [3] for early voluntary actions is one that we support. [4] Now, working it through the system and working it [5] in Kyoto and all of that, that's another matter. [6] But I would hope that the final result definitely [7] does include credit for early voluntary actions. [8] I know there is opposition to it and maybe [9] there are some disadvantages to it, but the [10] advantages far outweigh the disadvantages in my [11] opinion. [12] Madam Secretary. [13] SECRETARY ALBRIGHT: Let me address a [14] question to Dr. Mathews. I can just say, Jessica [15] and I worked together in the Carter Administration [16] and it was really thanks to her that I was smart [17] enough to even talk about climate change when I [18] taught here. [19] So, Jessica, you have studied this a long [20] time from the perspective of both science and [21] foreign policy considerations. Could you elaborate [22] for us what you see are the broader national
Page 200 [1] another nation where the costs, as Linn said, of [2] control are lower, would be earning credits that [3] they could sell to other companies or other [4] countries or else apply them to their own future [5] emissions control obligations. That is what we [6] mean by the, joint cooperative approach or joint [7] implementation. [8] What it would do is it would create new [9] export markets for U.S. greenhouse-friendly [10] technologies and it would be important in the [11] international context, as Mr. Wolfensohn has said, [12] because it would allow a transfer of technologies [13] to the developing nations and a transfer of [14] capacity that they will need to protect critical [15] resources like rain forests which are important [16] absorbers of carbon in the atmosphere. [17] Lastly, I would say that as the President [18] mentioned, under the acid rain system we are well-ahead of [19] schedule in reducing sulphur emissions at [20] well below the projected costs. [21] VICE PRESIDENT GORE: One-tenth of the [22] costs.	Page 203 [1] security interests that the United States has in [2] seeking this kind of a global agreement? [3] DR. MATHEWS: Madam Secretary, it is a big [4] question to get at. I see that we are facing [5] basically in these negotiations three questions: [6] How, who and when, as you have suggested in your [7] opening remarks. [8] The most important issue, I think, to [9] understand about the how question is that this is, [10] in my view, the most difficult issue that has ever [11] been negotiated internationally, period. In terms [12] of the breadth of involvement of these gases in the [13] entire economy, the breadth and variety of impacts, [14] the persistent uncertainties, the long time scales, [15] no negotiation that I know of approaches it in [16] complexity and difficulty. [17] Moreover, all the mechanisms that are [18] going to be needed are going to have to be [19] invented. Even the sulphur model that is employed [20] domestically is a pale shadow of what is going to [21] be needed internationally. [22] The design, the accounting, the
Page 201 [1] MR. KRUPP: One-tenth of the costs that [2] many in industry estimated and that's why I so [3] agree with the point that Linn has just made and [4] the point that was made this morning that we need [5] to find a way to give companies and countries [6] incentives to reduce early because we will see, [7] then, early reductions. [8] The costs of delay to the environment will [9] be very real. And those are not only environmental [10] costs but, I think, economically the best thing we [11] can do to assure a soft economic landing, if you [12] will, is to make sure that the steepness of the [13] curve of reduction does not end up having to be so [14] dramatic. And, so, to avoid the dramatic and [15] draconian reductions later, I would urge that we [16] begin on a path of reductions as soon as eight [17] years from now, in other words, by 2005. I think [18] we can do better than 1990 levels. [19] [Applause.] [20] VICE PRESIDENT GORE: Thank you very much. [21] Thank you very much, Fred, and thank you [22] for your great work on this issue.	Page 204 [1] monitoring, the enforcement, all of these things [2] have to be done for the first time and we know when [3] we do things for the first time you always make [4] mistakes. So, it puts an added difficulty on this [5] regime that it be extraordinarily adjustable. [6] On the who question, as much as this is [7] the most difficult negotiation that has ever been [8] attempted, I think it is also, it is potentially as [9] divisive a one as has ever been attempted. [10] In terms of the difference between past [11] and future contributions, in terms of the [12] differential impacts between countries and regions, [13] and the interconnectedness of every country, the [14] word adaptation has virtually not been mentioned [15] today. I think I have not missed it. [16] One thing we do know for sure is that the [17] climate, while we are negotiating all of this and [18] implementing, is going to be changing. And there [19] is going to be a lot of very expensive adaptation [20] that is going to have to be done willy-nilly and [21] the developing countries are perfectly well aware [22] that they are the most vulnerable to this change

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[1] that will have to be adapted to. That in terms of
[2] money and technology and human capital, they are
[3] the least equipped to do it. They are not blind to
[4] that reality.

[5] On the question of when, this one is in
[6] some ways the toughest I think. It is ironic that
[7] after 25 years of very hard work on the science we
[8] are now 66 days from Kyoto and if you think that
[9] our understanding of the physical science, despite
[10] all the uncertainties, is somewhere up here and our
[11] understanding of the natural science is somewhere
[12] down here, our understanding of the social science
[13] is way down to the floor.

[14] And the policy--
[15] **VICE PRESIDENT GORE:** Where is the
[16] political science on that?

[17] [Laughter.]

[18] **DR. MATHEWS:** Well, I'm including the
[19] political science down there with the social
[20] science. We do have to, we don't really have as
[21] good a grasp--and I don't mean we, Americans, I
[22] mean anybody--on all these mechanisms.

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[1] Whether we should be measuring
[2] concentrations, emissions, whether we should be
[3] using taxes or tradable permits or in what
[4] combination, how joint implementation would work,
[5] if it would work, all these things, our readiness
[6] to act on this is nowhere near the level of our
[7] understanding of the science.

[8] I would say that probably the only thing
[9] we know for absolute certain on this is what has
[10] been proved in the five years since the Rio Summit
[11] which is that voluntary actions won't work and that
[12] is progress. It was probably a stage that we had
[13] to go through.

[14] So, what to expect out of Kyoto? First of
[15] all, don't expect instant regime. It generally
[16] takes more than a decade to negotiate and implement
[17] a global regime. The record is the nuclear
[18] nonproliferation treaty took seven years under the
[19] threat of nuclear holocaust. This one began in
[20] about 1990, so, we're doing not so bad.

[21] And Kyoto, this round of negotiations is
[22] the beginning of a very long process. So, that's

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[1] the first thing.

[2] A key point then is to ask ourselves what
[3] defines success and failure in Kyoto. For my
[4] money, success in Kyoto--I think I have a pretty
[5] low threshold here--would be a commitment on the
[6] part of the developed countries to go first with
[7] some specificity as to how fast and when--not
[8] necessarily the full answer on target, some
[9] timetables--and a promise by the developing
[10] countries to go second.

[11] If we could come home from Kyoto with
[12] that, that in my book anyway, would be success.

[13] Finally, the President had mentioned this
[14] morning, made a passing reference to something that
[15] is terribly important and that is that we have got
[16] to ratify whatever we ultimately come home with.
[17] The only international agreements that have ever
[18] been attempted that have required congressional
[19] approval that are as broadly, have as broad an
[20] impact on our economy as this one will, are the
[21] multilateral trade agreements and for Congress to
[22] deal with those we have needed fast track.

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[1] We have needed an admittedly undemocratic,
[2] not very transparent process. And the reason we've
[3] needed it is because it is so hard to negotiate and
[4] then ratify something with this many economic
[5] impacts.

[6] So, the how question on the back-end, what
[7] we can swallow once we have bitten it off
[8] politically, is just as important as what we can go
[9] to negotiate.

[10] What I think--those are some of the
[11] parameters to answer the question of the national
[12] interest here. I would simply say that the
[13] engagement of our national security interests in
[14] this issue measure up to the complexity that I have
[15] just described.

[16] [Applause.]

[17] **SECRETARY ALBRIGHT:** Jessica, if I could
[18] just ask you, as you raised the political dimension
[19] of this, one of the problems that one deals with as
[20] there are critics of this whole concept is, are we
[21] giving up American sovereignty when we sign on to a
[22] climate change treaty.

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[1] How do you deal with that question when
[2] you are talking to the American public on this?

[3] **DR. MATHEWS:** Every international
[4] agreement you give up a little piece of sovereignty
[5] in order to get something more back, well-being and
[6] security. This issue was raised with the
[7] ratification of the GATT treaties, as well.

[8] I think the reality is that in the world
[9] that we live in ceding tiny bits of sovereignty
[10] bite after bite is the name of the game.

[11] **VICE PRESIDENT GORE:** Let me just mention
[12] one thing about your comments concerning the
[13] multilateral trade agreements. I agree that this
[14] is so pervasive in its relationship to the U.S.
[15] economy, there is really nothing else like it in
[16] the environmental field.

[17] But I think that in some respects we can
[18] learn from what happened in the Montreal Protocol,
[19] the international treaty by which the world
[20] community began to address these emissions into the
[21] atmosphere that were found by the scientists to
[22] destroy the stratospheric ozone layer.

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[1] And many years after the scientists,
[2] Sherwood Roland [ph] and Marion Malina [ph] leading
[3] the way, for many years after they laid out the
[4] scientific evidence, finally the nations of the
[5] world got their act together enough to enter into
[6] this agreement that had sort of broad goals and
[7] started moving us in the right direction and that
[8] was in 1987.

[9] We just had the tenth anniversary of it.
[10] But then, after those broad goals and
[11] mechanisms were put into place, the evidence became
[12] ever clearer and the support among peoples around
[13] the world for taking stronger action began to grow
[14] significantly.

[15] And the fact that we were beginning to
[16] make progress and move in the right direction
[17] elevated the confidence level that we could solve
[18] the problem and then all of a sudden there were
[19] follow-on treaties that had the world speed up
[20] dramatically and it ended up like the case was with
[21] the sulphur emissions trading, it ended up being
[22] only a tiny fraction of the cost projected by some

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[1] of the economic studies, and we are now well on our
[2] way toward solving that problem.

[3] We have got a long way to go, we have got
[4] some tough problems to handle, still, but we are
[5] way down the road toward solving that problem. I
[6] think that is an analogy also. Because I think
[7] that if we can get the right kind of agreement in
[8] Kyoto then as the evidence builds to make a
[9] broader, stronger consensus possible, we will be
[10] able to move much faster in the years ahead.

[11] **DR. MATHEWS:** I think, Mr. Vice President,
[12] that that's exactly right. And one hears the
[13] argument made about chlorofluorocarbons, the same
[14] one that is made about sulphur, well, that is a
[15] much tinier bit of the economy.

[16] **VICE PRESIDENT GORE:** Smaller, much
[17] smaller.

[18] **DR. MATHEWS:** But I think it is also true
[19] that Mr. Casten's answer this morning was exactly
[20] right, which was that where somebody else saw
[21] difficulty, he saw opportunity.

[22] **VICE PRESIDENT GORE:** Right.

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[1] **DR. MATHEWS:** It is true that what
[2] happened with the CFCs was that it looked
[3] impossible, there was even a very famous study that
[4] concluded that the cost of CFC substitution was
[5] infinite because there were some uses for which
[6] there was no conceivable substitutes.

[7] Well, it turned out that there were plenty
[8] but there had never been a reason to try, right?
[9] These were cheap, they were useful, they were
[10] benign, down here on the earth. And, so, who knew?
[11] There was never a reason to look. So, it looked
[12] like there were no substitutes.

[13] In the energy field we know that there are
[14] a whole closet-full of technologies sitting out
[15] there, many of which cannot get in the market place
[16] because energy is just too cheap. And, so, we know
[17] there are, I think you said it and pointed the way
[18] before, the political science of this is tougher
[19] than either the economics or the energy side.

[20] **VICE PRESIDENT GORE:** Well, thank you very
[21] much.

[22] And before we close this panel and invite

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[1] the members of the fourth panel to come out, I want
[2] to ask the Secretary of State, Madeleine Albright,
[3] if you have any concluding comments?

[4] **SECRETARY ALBRIGHT:** Yes, thank you very
[5] much, Mr. Vice President.

[6] Thank you to all the panelists. Let me
[7] say that I have looked at this from the perspective
[8] of the State Department as a brand new and
[9] interesting challenge in the following way. As we
[10] have begun to study it, it is evident to me more
[11] than any other subject that I have ever dealt with
[12] that it includes everybody in the United States
[13] Government.

[14] And when Jessica says it is the most
[15] complicated negotiation ever internationally, if
[16] you consider that it has so many internal
[17] dimensions in the United States, it obviously has
[18] those same dimensions in other countries. And,
[19] therefore, it is a tick-tack-toe game of all kinds
[20] of dimensions that we have to work with that is a
[21] huge challenge to all of us as we look at the
[22] domestic and international aspects of this.

[1] And we have found that in the government
[2] by engaging the interagency process in this we are
[3] learning a great deal more about our own economy,
[4] about climate, about the way we work with
[5] developing countries, how we relate to developed
[6] countries so that it is a massive project which I
[7] think ought to be seen as a challenge in the way
[8] that we are going to do foreign policy in the 21st
[9] century.

[10] So, I find it a very important and
[11] challenging goal for all of us to work this out and
[12] I am very grateful that we have had this particular
[13] day. Because I think it is a way that we are going
[14] to be looking at lots of problems in the future.

[15] And I thank you all very much.

[16] [Applause.]

[17] **VICE PRESIDENT GORE:** Thank you.

[18] You know, as President of the Senate, I
[19] often have the responsibility of presiding over the
[20] Senate and one of the common phrases used by the
[21] presiding officer there is, will those please
[22] engaged in conversations in the aisles, please,

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[1] take their seats and cease all audible
[2] conversation. I never thought I would use that
[3] anywhere outside the Senate Chamber.

[4] I want to thank all of you for joining us
[5] for this fourth and final panel today. I am very
[6] pleased to be joined by my colleague, the Deputy
[7] Secretary of the Treasury, Larry Summers. I am
[8] going to call on Secretary Summers for the first
[9] presentation and I am going to ask him to introduce
[10] our colleagues on the panel here and then he and I
[11] will share the moderating responsibilities. But,
[12] Secretary Summers, please, lead off.

[13] **DEPUTY SECRETARY SUMMERS:** Thank you very
[14] much, Mr. Vice President.

[15] As a member of the President's Economic
[16] Team I am glad to be here to discuss this critical
[17] issue. I think it's very clear that the global
[18] warming threat is real. There is now a consensus
[19] that if we fail to limit global emissions of
[20] greenhouse gases there are likely to be real
[21] effects in the form of higher temperatures, a
[22] disruptive climate and potentially very important

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[1] disruptions in the functioning of the global
[2] economy.

[3] Anyone who doubts that climate has
[4] important economic implications need only look at
[5] the impact of El Nino. Droughts and other El Nino
[6] effects have already prompted several governments
[7] to declare a state of emergency and have put a
[8] severe dent in the production of many of the
[9] world's most important foodstuffs.

[10] The world's commodity traders now monitor
[11] El Nino almost as closely as they monitor the Fed.
[12] And the catastrophic insurance industry has been
[13] paying very close attention indeed, because of its
[14] concern with the effects of hurricanes, to the
[15] threat of global warming.

[16] The question is not whether we can respond
[17] effectively to that threat. We can and I believe
[18] we must. More than 2,000 economists, including
[19] eight Nobel Laureates, several members of this
[20] panel, have concluded that there are policy options
[21] that would slow climate change without harming

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[1] American living standards and that these measures
[2] may, in fact, improve productivity in the long run.
[3] Economists can contribute to the effort to
[4] combat global warming by helping us to answer two
[5] central questions. First, they can help us decide
[6] on the goals that we should set for ourselves, on
[7] what path can we best achieve our environmental
[8] objective and our economic objective, as well.
[9] Second, and perhaps more important,
[10] certainly as important economic analysis can inform
[11] our search for the best way forward to meet our
[12] given goals of choosing the best way forward, which
[13] I think several of our panelists will suggest is
[14] based on a flexible market-based approach. It is
[15] important for the economy and it is important for
[16] the environment as well, because if we act in as
[17] inexpensive a way as possible we will be able to
[18] act to the maximum extent.
[19] We have with us to discuss these issues a
[20] distinguished panel of experts including Robert
[21] Repetto, from the World Resources Institute; Rob
[22] Stavins, from the Kennedy School of Government;

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[1] John Sweeney, Chairman of the AFL-CIO, perhaps an
[2] honorary economist for this occasion; William
[3] Nordhaus, from Yale University; and Richard Sandor,
[4] the Vice Chairman of the Chicago Board of Trade.
[5] VICE PRESIDENT GORE: Well, thank you very
[6] much, Mr. Secretary, and I will now turn to Bob
[7] Repetto for the next comments.
[8] And in your comments, Bob, please, address
[9] this question: What is the optimal approach in
[10] your view that would allow us to act aggressively
[11] to reduce emissions without damaging the economy in
[12] the process and how would a policy along these
[13] lines be structured?
[14] MR. REPETTO: Mr. Vice President, thank
[15] you.
[16] You know, there has been a great deal of
[17] analysis on this issue. There have been hundreds
[18] of simulations with dozens of economic models and
[19] as I read it, five essential elements come out of
[20] this.
[21] First, as others have said and as Larry
[22] Summers just said, using market-friendly economic

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[1] instruments such as selling carbon permits that
[2] firms can trade in the market place or phasing in
[3] carbon taxes will be much more efficient than
[4] command and control regulatory systems.
[5] Second, using revenues from these policies
[6] to reduce business tax rates can stimulate
[7] employment and investment without increasing the
[8] budget deficit. Offsetting the effects of higher
[9] energy prices with tax cuts can substantially
[10] improve economic outcomes.
[11] Thirdly, as many people have said,
[12] creating an international system of joint
[13] implementation or carbon permit trading that
[14] involves Eastern Europe, the Former Soviet Union
[15] and important developing countries can lower the
[16] cost substantially and provide important economic
[17] gains for all parties.
[18] Fourth, an active technology policy
[19] program to accelerate the development and diffusion
[20] of renewable energy and energy saving technologies,
[21] if supported by appropriate market price signals,
[22] can substantially reduce the long-run costs.

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[1] And fifth and finally, providing clear,
[2] credible, consistent policy signals as early as
[3] possible to reduce uncertainty in the economy and
[4] allow business and the public enough time to make
[5] appropriate plans and investment decisions will
[6] reduce short-run dislocations.
[7] If this approach is taken, carbon
[8] emissions can be reduced without damaging the
[9] economy. Well over a dozen economic modeling
[10] studies have analyzed the issue. Even the most
[11] pessimistic find that emissions can be stabilized
[12] at 1990 levels by the year 2010 while the economy
[13] continues to grow at almost its long-run trend
[14] rate.
[15] Under the worst case assumptions, the
[16] growth the United States economy is likely to
[17] expand over the next 20 years, about a 50 percent
[18] rise in real GDP, would instead take 21 years to
[19] achieve. That is essentially the worst-case
[20] scenario.
[21] However, if these elements are adopted in
[22] an optimal approach, these analyses find that—adopting

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[1] these policies would allow American living
[2] standards to rise more rapidly over the next 25
[3] years than if we do nothing.
[4] Mr. Vice President, in closing, I would
[5] like to mention the impact of these policies on the
[6] competitive position of U.S. industry abroad. Of
[7] course, our main trading and investment partners in
[8] the OECD countries have already indicated their
[9] willingness to do as much as the United States will
[10] in reducing greenhouse gas emissions and, so,
[11] competitive impacts within the OECD will be
[12] negligible.
[13] It is also important to recognize that the
[14] largest industrializing countries, including
[15] Russia, China, India, Brazil, Poland and others,
[16] since 1990 have taken significant steps to reduce
[17] energy subsidies. A World Bank report indicates
[18] that they have gone down by 50 percent, they have
[19] raised energy prices already relative to prices in
[20] the United States and have opened up and reformed
[21] their energy sectors to make them more efficient.
[22] They have done so not to protect the climate but to

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[1] restructure their faltering economies, but in the
[2] process, have already contributed to the solution
[3] of the climate problem.
[4] If they go second, these energy sector
[5] reforms are likely to continue because their
[6] motivation is economic self-interest and
[7] sustainable development in their own economies.
[8] For these and other reasons, I believe that U.S.
[9] emissions can be reduced without a flight of
[10] factories and jobs to other countries.
[11] Thank you.
[12] [Applause.]
[13] VICE PRESIDENT GORE: Thank you very much,
[14] Bob. I hope we will have time to come back and
[15] explore some of this.
[16] DEPUTY SECRETARY SUMMERS: Bill Nordhaus,
[17] you have done some of the most widely cited
[18] analyses of the economic implications of policies
[19] to impact on global warming. What are your
[20] thoughts about the best way forward to go in terms
[21] of reducing emissions?
[22] PROFESSOR NORDHAUS: Well, I guess at the

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[1] end of a day talking about the future it is time to
[2] call out the economists and ask, how much is it all
[3] going to cost?

[4] As I listen to this and have read this, I
[5] am concerned that we are greatly underestimating
[6] the size and complexity of the undertaking and my
[7] message is that we must move cautiously so that we
[8] protect our economy as well as our environment.

[9] Let me start with costs. What people are
[10] urging is to reduce emissions in the United States
[11] to 1990 levels by the year 2010. Just to be clear,
[12] this according to most studies, this involves
[13] reducing emissions by about 30 percent relative to
[14] business as usual.

[15] Now, from an economic point of view, that
[16] is a very large cut. I looked at the studies,
[17] including the Government Interagency Task Force,
[18] and I was struck by the close similarity of the
[19] projected economic impacts there to the energy
[20] price shocks of the 1970s.

[21] If you look at the studies, most of them
[22] find that these targets will involve raising energy

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[1] prices sharply, approximately a doubling of
[2] wholesale energy prices and approximately a 300
[3] percent increase in the price of coal. And this is
[4] actually larger than the price increase during
[5] either of the oil price shocks of the 1970s.

[6] And, so, I think the thing we have to be
[7] concerned about is to make sure that we don't bring
[8] an energy price shock upon ourselves because this
[9] was, after all, the worst economic period in the
[10] United States since the Great Depression.

[11] Now, you might ask, will technology bail
[12] us out? And I have no doubt and I think there has
[13] been a lot of evidence for this for many years,
[14] that there's great potential for technological
[15] savings, from the light bulbs we talked about this
[16] morning, to the fuel cells and on to advanced power
[17] systems.

[18] But I think the evidence of the last
[19] quarter century, as well, is that we are not going
[20] to introduce these wondrous technological miracles
[21] unless people face higher energy prices. As we
[22] heard in the last session, energy is too cheap, too

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[1] cheap to get us out of our utility vans, too cheap
[2] to make us look at all our systems.

[3] When will we change the light bulbs? When
[4] it is economically imperative to do so.

[5] Now, I want to say a word about risks and
[6] damages because there's been a great deal of
[7] economic work on this. Most economists who have
[8] looked at this believe there are major long-run
[9] environmental, economic and political risks
[10] involved in global warming and there have been
[11] dozens of studies on the impacts on such sectors as
[12] agricultural, sea-level rise, health and energy.

[13] And, so, economic studies have tried to
[14] ask, what is a sensible balancing of the economic
[15] costs and the costs of adaptation, on the one hand,
[16] with the climate risks on the other? The answer
[17] is, we should move ahead, we should strive for
[18] slowing the growth in emissions, we should move to
[19] increase the prices of fossil fuels.

[20] I think a very attractive model that comes
[21] out of these studies that would be something that
[22] marries the U.S. proposal of tradeable permits that

[1] we heard about in the last session with a target
[2] price of carbon in the order of \$10 a ton for
[3] carbon, plus or minus whatever sensible margin
[4] seems necessary.

[5] And this would compare with numbers of
[6] about \$100 a ton of carbon which are the ones that
[7] would be involved in current proposals.

[8] So, in summary, we do need to slow the
[9] greenhouse express. If we do nothing there is a
[10] risk that we are going to crash into the reefs.

[11] But at the same time if we step on the
[12] brakes too quickly we may crash through the
[13] windshield. So, what we need is a kind of middle
[14] ground which raises energy prices gradually to give
[15] the proper signals to consumers, producers and
[16] technologists and to put us on a more sustainable
[17] and sensible path.

[18] Thank you very much.

[19] [Applause.]

[20] VICE PRESIDENT GORE: Well, thank you very
[21] much. In other words, avoid shocks to the economy.
[22] In 1973 and then again in 1978 and 1979, the

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[1] increases were immediate, dramatic and sudden. In
[2] this case, whether prices are involved or not,
[3] whether it is trading regimes, joint implementation
[4] or whatever it should be over a long enough period
[5] of time and in a gradual enough process to allow
[6] the forces of the market place to help us
[7] accomplish our goals as efficiently as possible.

[8] PROFESSOR NORDHAUS: I would emphasize
[9] that point. It's very important, as people look
[10] out and they ask how are we going to build these
[11] new buildings, what kind of power plants are we
[12] going to build, what are we going to equip them
[13] with, what kind of cars are we going to buy, that
[14] people look out and expect that things are going to
[15] get a little tighter and we ought to move a little
[16] away from the fossil fuels that we are using.

[17] And, of course, the way, as unhappy as it
[18] is, as unpleasant as it is, the real way people see
[19] that signal is when they see they see the prices
[20] rising or they expect them to rise. But the
[21] message is, gradual is much less costly.

[22] VICE PRESIDENT GORE: Thank you very much.

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[1] I want to turn now to Robert Stavins, who
[2] is Professor of Public Policy and Chair of
[3] Environment and Natural Resources of that Program
[4] at the John F. Kennedy School at Harvard.

[5] Professor Stavins, what are your thoughts
[6] on this?

[7] PROFESSOR STAVINS: Well, Mr. Vice
[8] President, and Mr. Secretary, I think we can safely
[9] say that no one in this room is interested in just
[10] paying lip service to what is obviously a very
[11] important global problem. So, the first thing I
[12] would like to state is to note that voluntary
[13] initiatives or wishful thinking are simply not
[14] going to be able to do the job of meeting the kind
[15] of CO2 emission targets that have been discussed in
[16] the United States and other countries.

[17] If the targets are, themselves, serious,
[18] if they are aggressive then either very serious
[19] command and control standards or very serious and
[20] meaningful price signals are going to be required.
[21] At this point, we have 30 years of experience that
[22] has taught us something. It has taught us that

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[1] market-based instruments, in this case essentially,
[2] energy taxes or tradable carbon permits can
[3] transmit those price signals and they can bring
[4] about the changes that are needed. Changes in fuel
[5] use, in the short-term movements from coal to
[6] natural gas in established facilities; changes in
[7] technology, by which I mean commercialization and
[8] diffusion throughout the economy of those
[9] technologies that the Department of Energy study
[10] has identified as being technically feasible; and
[11] also energy conservation to lower overall energy
[12] demand.

[13] Price signals can do that and the studies
[14] that have been carried out by Bill Nordhaus and by
[15] others, indicate that they can do it at a savings
[16] of 90 percent or more of the overall cost of
[17] abatement compared to a conventional or let's call
[18] it old-fashioned way of doing the job.

[19] Now, both Bob Repetto and Bill spoke of
[20] taxes so I'm going to turn instead and focus on
[21] that other market-based instrument tradeable
[22] permits. Because something else we have learned is

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[1] that tradable permit systems can be designed well
[2] or they can be designed poorly.

[3] And in the United States we have the
[4] experience of doing both. So, I want to make a few
[5] suggestions. The first one is if there is a model
[6] for carbon trading and I hesitate to say that there
[7] is, it is not necessarily the highly successful
[8] sulphur dioxide allowance trading program but it
[9] just might be EPA's phenomenally successful phase-out of the
[10] lead in gasoline in the 1980s which was
[11] also accomplished by a tradeable permit system
[12] among refineries.

[13] My point is that we should not be captured
[14] by the notion of thinking of CO2 emission permits
[15] but by thinking of upstream carbon content permits
[16] traded among primary producers of fossil fuels and
[17] among importers.

[18] Secondly, if these permits are auctioned
[19] and there are arguments economically of why they
[20] ought to be, those revenues ought to be fully
[21] rebated to the economy through cuts in taxes, on
[22] labor and taxes on capital.

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[1] Third, despite, again, the great success
[2] of the tradeable permit program for sulphur
[3] dioxide, and I think it is a success that anyone
[4] who has cared about these instruments applauds, we
[5] shouldn't misread the evidence. Careful analysis
[6] of the fact that the prices have come down as much
[7] as they have tells us there is nothing there,
[8] unfortunately, to suggest that carbon trading is
[9] going to be miraculously cheap.

[10] Fourth, I want to emphasize something the
[11] Vice President said that is exceptionally important
[12] and that is that time matters. It is not just the
[13] flexibility of allowing the control to take place
[14] in appropriate locations but allowing it to be
[15] spread out over time as with the case of banking of
[16] permits.

[17] Finally, the cost with any domestic
[18] instrument is going to be much lower if it is
[19] combined with broad-based, international allowance
[20] trading. Not simply what is currently described as
[21] joint implementation.

[22] So, in conclusion, if we are not

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[1] interested in simply paying lip service to global
[2] climate change, and again I'm assuming that no one
[3] in this room is, then I think the only option that
[4] is really credible is for the United States to use
[5] market-based instruments.

[6] Thank you.

[7] [Applause.]

[8] VICE PRESIDENT GORE: Very good, thank you
[9] so much.

[10] I wanted to ask a brief follow-up
[11] question. You were quoted last week in the New
[12] York Times as supporting a kind of economic safety
[13] valve mechanism whereby we would cap the cost of a
[14] given policy so that if there were some kind of
[15] miscalculation then there would be a safety valve.
[16] Can you explain this idea?

[17] PROFESSOR STAVINS: Certainly, Mr. Vice
[18] President.

[19] This approach addresses a fundamental
[20] dilemma. The dilemma is, on the one hand, some
[21] people, including many in the business community
[22] but many others as well, fear that meeting

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[1] specified targets is going to be exceptionally
[2] costly. They might be right, I don't know.

[3] On the other hand, many others, including
[4] many in this room and many in the environmental
[5] community, predict that it is going to be very
[6] cheap and, indeed, some early panels would say,
[7] costless, to achieve these targets. And, again, I
[8] don't know. I will be agnostic on that and I don't
[9] think any of us really knows.

[10] A compromise that would address the
[11] interests then of both of these groups of their
[12] concerns would be a system that essentially links
[13] an emission target with a safety valve for the case
[14] of unexpectedly high costs. Now, this approach has
[15] been proposed by a number of researchers, the
[16] University of Texas, the World Bank, and Resources
[17] for the Future.

[18] And it would work essentially like this.
[19] The government will allocate permits, enough
[20] permits in order to meet the precise targets that
[21] the government chooses and, at the same time, the
[22] government will state up-front that it will offer

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[1] for sale additional permits at a given price, for
[2] example, \$10 per ton of carbon content of fossil
[3] fuels.

[4] If the optimists on this—I will call them
[5] the environmental advocates—are right, if it turns
[6] out to be exceptionally cheap to reach that
[7] emission target, we will reach the target, we will
[8] do it at low cost and we will all be exceptionally
[9] happy.

[10] On the other hand, if it turns out that
[11] the pessimists on this issue, the cost pessimists,
[12] are correct and it costs more than that to reach
[13] the targets then, in fact, we will be capping the
[14] permit price at \$10 per ton, we will be capping
[15] marginal abatement costs, we will be capping the
[16] costs to private industry at \$10 a ton as well.

[17] So, this kind of hybrid policy instrument
[18] which combines features of what is normally thought
[19] of as a tax but works completely through a tradable
[20] permit system works because what it does is make
[21] the target, itself, sensitive to the costs. And I
[22] think this is the kind of instrument that could

[1] really set us on the path to taking what the
[2] President described earlier this morning as
[3] moderate but disciplined first steps. In other
[4] words, a good beginning.
[5] **VICE PRESIDENT GORE:** Great, thank you
[6] very much.
[7] I want to call now on my friend John
[8] Sweeney. And, John, I know that organized labor
[9] has serious concerns about how a policy to deal
[10] with climate change might affect working men and
[11] women in this country and, particularly, how it
[12] might affect the number of jobs and the nature of
[13] the job market.
[14] However, I know from my discussions with
[15] the folks who are working on this in the AFL-CIO,
[16] that there is widespread recognition that this is a
[17] real issue that must be dealt with. So, what kind
[18] of policy would you recommend to address the
[19] environmental problem we face while protecting our
[20] economy and our workers?
[21] **MR. SWEENEY:** Well, first of all, I want
[22] to thank you and the President for your leadership

[1] on this and for this conference today and I am
[2] happy to be with Secretary Larry Summers, as well.
[3] We, in the labor movement, feel that regardless of
[4] which study you examine the economic stakes for the
[5] United States are enormous. And we really feel
[6] that it is essential that we do whatever we do
[7] carefully.
[8] Our share of global carbon emissions is so
[9] large that even modest reduction measures, if not
[10] done carefully and with enough time to manage
[11] difficult adjustment questions, could have
[12] catastrophic economic effects. In any event, the
[13] magic of the market is not a sufficient tool. We
[14] must plan and plan carefully. We must begin to
[15] make the investment in new technology and new
[16] carbon suppression measures now.
[17] The keys to doing this and doing it the
[18] right way are taking enough time and being clear as
[19] to our ultimate objectives. There is nothing magic
[20] about 2010 or any other target date and there's
[21] nothing magic about 1990 emissions levels.
[22] Rather the decision about a target date

[1] should really be based on taking enough time to
[2] manage the economic transition and the emissions
[3] target must follow not precede a discussion about
[4] the global concentration level that the entire
[5] world community seeks to achieve.
[6] None of this is to say that we should not
[7] act. We should. But we must act thoughtfully and
[8] with a clear intent. With a clear intent of
[9] protecting our economy, and the women and the men
[10] who have made that economy successful, the most
[11] productive in the world.
[12] We think the American people will
[13] understand and appreciate the sacrifices that are
[14] asked of them if we speak to them rationally about
[15] sensible solutions to carbon reduction. Loose talk
[16] about more jobs sometime in the future is not an
[17] adequate response to those who face job loss now
[18] and those who will see entire industries, entire
[19] communities disrupted if we do not get this right.
[20] We ought to be guided by some core
[21] principles. Whatever we do, we must assure global
[22] environmental repair. If it does not, we cannot

[1] and should not ask American workers to pay a known
[2] price for an uncertain outcome.
[3] Every nation must participate on an
[4] equitable basis. We must not create incentives for
[5] job and investment to move elsewhere. We must put
[6] in place and assure adequate funding for a just
[7] transition regime that forces us to plan ahead and
[8] create the sort of environment and economy that we
[9] all can have.
[10] Thank you.
[11] **VICE PRESIDENT GORE:** Thank you very much.
[12] [Applause.]
[13] **MR. SUMMERS:** Richard, you are a man who
[14] operates in markets where there is trading every
[15] minute of the day, 365 days a year. We've heard a
[16] lot about the concept of trading emissions as well
[17] as pork bellies.
[18] Maybe you could give us a feel for your
[19] experience with the acid rain trading program and
[20] discuss the lessons of your experiences in trading
[21] for policy in this area.
[22] **MR. SANDOR:** Thank you, Mr. Vice President

[1] and Mr. Secretary, and I, too, would like to
[2] commend the White House and all of you for giving
[3] us the opportunity to hear this private sector
[4] viewpoint.
[5] I will take a contrary opinion. I'm very
[6] excited about the possibility of market-based
[7] solutions for the environment. While I do see a
[8] difference between the SO2 market and the carbon
[9] market and I do recognize the very intelligent
[10] viewpoint of Dr. Nordhaus and Stavins and my other
[11] colleagues, here at the panel, I think there are
[12] more similarities than there are differences.
[13] I think in the early days of debate and
[14] the policy opinions, the questions that were asked
[15] at that particular time people said, let's set
[16] fines at \$2,000, let's have auctions at \$1,500, the
[17] best minds said \$600. The auctions started five
[18] years ago, prices went from \$300 to \$250 to \$200 to
[19] \$150 to \$100 down to \$70 a ton. We went slowly, we
[20] learned, we implemented.
[21] There was a big debate at that time. Some
[22] of it was it was too large and too comprehensive

[1] and the other was there were too few sources to
[2] make a difference. In fact, we did cut a middle
[3] ground.
[4] People worried about quasi-property
[5] rights, how would they fit in the securities
[6] markets. Would we accept quasi-property rights and
[7] liens and things of that nature. Could we adapt
[8] arcane swap documentation which is used to hedge
[9] interest rates to trade sulphur dioxide? And the
[10] answer to all of those questions was a very simple
[11] and a very dramatic, yes.
[12] The question now going forward is what are
[13] the steps that we should take to mitigate carbon
[14] emissions? I am concerned about the problem, I
[15] think the problem is one that we all have to be
[16] concerned about and I'm particularly concerned
[17] about its irreversibility.
[18] Right now the market is already taking
[19] some actions as we speak. It is an inchoate market
[20] right now. Arizona and New England trades are
[21] occurring between sulphur dioxide and carbon. In
[22] May, the company that I represent and who I am

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[1] speaking on behalf of, Centre Financial, did a very
[2] small trade in Costa Rica, monetizing 1.1 million
[3] acres or the first of it.
[4] We have a mandate from the government of
[5] Costa Rica to create 1.1 million acres, 4 million
[6] tons of rain forest protection credits which have
[7] been certified by the Department of Energy as CTOs.
[8] We have something and I believe social
[9] scientists call it the demonstration effect. I
[10] think in Washington you call it flying a balloon
[11] and seeing what's happening.
[12] **DEPUTY SECRETARY SUMMERS:** Trial balloon,
[13] yeah.
[14] **DR. SANDOR:** Trial balloons. Well, the
[15] demonstration effect is throw up a price and see
[16] what happens. We threw up a price of \$20 and
[17] people came to us and said, we can basically take
[18] landfills, co-generate power and reduce methane.
[19] Other people came to us and said, we can, in
[20] effect, take solar power which is being used in
[21] Arizona and if you can monetize, just give us a
[22] small amount of credit for dollar reductions, that

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[1] makes it viable.
[2] Top soil, if you could plant vegetation
[3] and get paid for the carbon created. That is not
[4] only good for the farmers but it also might have
[5] some monetization value.
[6] All of these are signals and the \$20 a ton
[7] which is the highest cost, unlike Mr. Draper's of
[8] \$1 or \$2, that turns out to be at today's price,
[9] and it is the only price I know and Mr. Secretary
[10] the one only a trader can act under, is a penny and
[11] a half per gallon of gasoline. That is the market
[12] price right now to get some carbon emissions from
[13] now for the next 20 years on land that goes in
[14] perpetuity in Costa Rica.
[15] Price signals are very important. And I
[16] never underestimate inventive activity or the role
[17] of entrepreneurs who take on bold tasks whether it
[18] is in chips or communication or in markets, or the
[19] ability to trade not only pork bellies, but
[20] mortgage-backed securities, other devices which
[21] make us the envy of all capital markets.
[22] In conclusion, I would like to say we

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[1] think a limited voluntary program, voluntary in the
[2] sense that nations opt-in to participate, voluntary
[3] in that sectors, in the second sense, may opt-in to
[4] help generate price transparency would give us a
[5] better idea to slowly move toward this goal.
[6] I think Dr. Mathews is right, we need a
[7] framework, we need a slow framework and if we can
[8] move into that and if the policy makers can give us
[9] the infrastructure for markets, let some of us
[10] practitioners try to bring that price down so there
[11] are no effects on the economy.
[12] [Applause.]
[13] **VICE PRESIDENT GORE:** Thank you very much,
[14] Richard, that is very intriguing.
[15] Is there a separate trading pit for
[16] sulphur dioxide?
[17] **DR. SANDOR:** Unfortunately, we are at the
[18] point where we conduct the auctions outside of a
[19] pit environment but we are and have had approved by
[20] the Commodities Futures Trading Commission both a
[21] future for SO₂ and options on SO₂. So, we may, in
[22] effect, have them pit-traded.

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[1] Now, they are just traded by an auction
[2] market.
[3] **VICE PRESIDENT GORE:** Well, we were
[4] speculating what, how long it would be before we
[5] had carbon derivatives and you've already got
[6] sulphur dioxide derivatives.
[7] **DR. SANDOR:** Yes. And they are in effect
[8] with these trades I mentioned now carbon
[9] derivatives. Environmental derivatives is what we
[10] like to call them, Mr. Vice President.
[11] **VICE PRESIDENT GORE:** Excuse me, I'm
[12] sorry, environmental derivatives.
[13] You said that these sulphur dioxide
[14] instruments are now selling for \$70 roughly?
[15] **DR. SANDOR:** They bottomed at \$70 and are
[16] now trading at roughly \$90.
[17] **VICE PRESIDENT GORE:** \$70 to \$90 is the
[18] current range?
[19] **DR. SANDOR:** Yes.
[20] **VICE PRESIDENT GORE:** And at the beginning
[21] the predictions were that they would be at how many
[22] hundreds of dollars?

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[1] **DR. SANDOR:** In 1990, the predicted levels
[2] ranged from 4 to 800 tons. The EPA was pretty
[3] aggressive at \$600 and some private sources were as
[4] high as \$1,000 a ton.
[5] **VICE PRESIDENT GORE:** Why do you think
[6] they were so wrong?
[7] **DR. SANDOR:** For several reasons. There
[8] were some unintended consequences. Part of it was
[9] due—and we have to look at it realistically and
[10] candidly—was reduction in rail rates that came
[11] about, deregulation. So, that Western low-sulphur
[12] coal was substituted.
[13] The second part was scrubbers and
[14] technology by the GE's and the Sea Brown Brevares.
[15] [ph], the others were fuel switching and the
[16] flexibility.
[17] I think what all of us will believe is the
[18] flexibility that a market-based system made
[19] compliance basically be able to be implemented in a
[20] cost-effective way and over a longer period of
[21] time.
[22] **VICE PRESIDENT GORE:** I'm going to offer

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[1] an additional hypothesis as to why the projections
[2] were so high. And I do so as a non-economist and
[3] with apologies and appropriate humility and I will
[4] ask for comments if anybody thinks I'm way off base
[5] here.
[6] I have long felt that just as in any
[7] profession there are certain conventions in the
[8] economics profession that are necessary and highly
[9] valuable in order to make the profession operate
[10] the way it does. But one of those conventions that
[11] I think sometimes causes problems is the assumption
[12] of perfect information.
[13] The idea that all other things being
[14] equal, the information about what choices are
[15] available and what the best courses of action might
[16] be are readily apparent or will shortly be readily
[17] apparent to anybody who looks for them and,
[18] therefore, the economy is operating at or near the
[19] optimum allocation of the resources that are
[20] available. You understand the point I'm getting
[21] at?
[22] **DR. SANDOR:** Yes.

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[1] VICE PRESIDENT GORE: And that's a
[2] necessary assumption but it is not always accurate.
[3] The classic joke is about the economist who walks
[4] down the street and a \$20 bill is laying there and
[5] he does not stoop over to pick it up because it
[6] wouldn't be there, it is obviously not there
[7] because if it was somebody would have already
[8] stooped over to pick it up.
[9] [Laughter.]
[10] VICE PRESIDENT GORE: And I think that
[11] some of the options for squeezing sulphur dioxide
[12] out of the environment at much lower levels of cost
[13] than turned out to be possible were assumed not to
[14] be there because if they were there they would have
[15] already been picked up.
[16] And similarly, I think that sometimes when
[17] we are on the verge of a new set of assumptions
[18] about how things are going to operate we, for the
[19] purposes of common sense, we say, well, we need to
[20] calculate these costs on the assumption that the
[21] low-hanging fruit or the easy choices if they were
[22] actually that profitable they would already be

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[1] showing up somehow.
[2] But just as a pump needs to be primed, the
[3] perception of and selection of the most cost-effective
[4] options needs to be lubricated by the
[5] liquidity of trading in the new ideas that have not
[6] even been looked at previously because they haven't
[7] been examined. There is a, I don't know,
[8] stickiness is a word that economists use. There's
[9] a certain stickiness that people have that keeps
[10] them stuck in the old way of looking at what is
[11] available and what is not available.
[12] And, therefore, when we start priming this
[13] particular pump and moving into a carbon emissions
[14] trading, I think that it is much more reasonable to
[15] assume that we don't have perfect information at
[16] all. We have no idea how many opportunities are
[17] out there to have very large savings at much lower
[18] costs because we haven't really felt the need to
[19] break out of our old way of looking at it and look
[20] in a new way.
[21] Now, if you would like to comment or
[22] Professor Stavins?

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[1] DR. STAVINS: Far be it from me to take on
[2] defending the 22,000 members of the American
[3] Economic Association. So, I will focus a little
[4] more on what I think is an important point you are
[5] raising, Mr. Vice President. And certainly I
[6] should not be interpreted and I think most
[7] economists should not be interpreted as slamming
[8] the SO2 tradable permits program. I worked very
[9] hard with Secretary Wirth at the time to coax the
[10] Bush Administration into developing and proposing
[11] that program to the Congress which enacted it.
[12] But I think it is very important that we
[13] learn correctly from the lesson so that we design
[14] better and better systems for global climate
[15] change. And the reality is that although it is
[16] true that very, very early on in the history there
[17] were numerical estimates of \$1,000 a ton trading,
[18] that if you look at the final estimates for the
[19] final legislation that was enacted that included
[20] something like a \$3.5 million bonus allowances
[21] given out to utilities that, in fact, the
[22] predictions were about \$170 to \$200 a ton.

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[1] You combine that with what Dr.-
[2] VICE PRESIDENT GORE: They were only off
[3] by a factor of 300 percent.
[4] DR. STAVINS: No, but I haven't-
[5] VICE PRESIDENT GORE: Okay, I'm sorry.
[6] DR. STAVINS: I'm going in the direction.
[7] VICE PRESIDENT GORE: All right.
[8] DR. STAVINS: You're right. So, so far,
[9] so where you are left then with this gap of \$70 to
[10] \$100. And Dr. Sandor has correctly pointed out
[11] that the deregulation of railroads which brought
[12] down freight costs for Powder River Basin low-sulphur coal
[13] to move it to the east, played an
[14] enormous part of that. And in addition to that,
[15] there are several other factors that suggest that
[16] it could be that the abatement costs are actually
[17] higher than what the permits are reflecting.
[18] Public Utilities Commissions are possibly
[19] restraining the trade in these permits as
[20] economists and I think most people would desire
[21] that that permit trading is free. There is the
[22] property rights issue because the Congress said

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[1] this is not a property right.
[2] So, my suggestion is that we learn from
[3] those lessons, the property rights and all the
[4] other ones, to design a better tradable permit
[5] system, a credible one for global climate change.
[6] DR. SANDOR: And I would agree with that
[7] hypothesis. I do question or having been involved
[8] in making some of the first trades in the SO2
[9] market, and having debated bid and offer prices,
[10] looking at that inefficient market, I found a much
[11] higher estimate just on one person's experience.
[12] I do think the Vice President is 100
[13] percent spot on that this is an illiquid,
[14] inefficient market.
[15] And right now somebody will make an
[16] argument that it is a \$100 ton and as a market
[17] practitioner I would like to ask them, could I sell
[18] that to you at that and the answer is often, no, I
[19] would like to buy at \$4 or \$5.
[20] So, now, we have a market, \$5 bid, \$100
[21] offered and somewhere in between-
[22] [Laughter.]

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[1] DR. SANDOR: -somewhere in between it
[2] trades, Mr. Vice President and I think that is far
[3] lower than what people think.
[4] VICE PRESIDENT GORE: And it is more fun
[5] when there is a pit, isn't there?
[6] DR. SANDOR: Yes.
[7] VICE PRESIDENT GORE: If we do carbon,
[8] there is going to be a pit for carbon.
[9] DR. SANDOR: We like the hand waving and
[10] open outcry.
[11] VICE PRESIDENT GORE: There's got to be a
[12] pit for carbon.
[13] Bill, did you want to comment?
[14] PROFESSOR NORDHAUS: Yes. I just wanted
[15] to say I think there are a couple of lessons here.
[16] The first is if the best minds in this area, and
[17] these are not just economists, these are utility
[18] executives, these are people who do estimates in
[19] the environmental community, are off by a
[20] significant amount, whether it is 100 percent or
[21] 500 percent, then I think the lesson there is there
[22] are really great uncertainties.

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[1] And I think we ought to carry that over
[2] here and say there really are large uncertainties.
[3] Whether it is a \$1 a ton or five cents a ton or
[4] \$100 a ton, I don't think I want to stake my
[5] reputation on one particular number.

[6] I think we need to design our policies
[7] with the idea that there are large uncertainties
[8] here.

[9] VICE PRESIDENT GORE: I think that's
[10] another argument in favor of the kind of safety
[11] valve approach that Mr. Stavins mentioned before. We have
[12] run out of time but if any of the panelists
[13] here want to make any other comments, I will
[14] certainly--

[15] Well, if not, let me just mention briefly
[16] that two members of our Administration's economic
[17] team who were not recognized earlier due to an
[18] oversight, include the Chairman of the National
[19] Economic Council Gene Sperling [ph], who has been
[20] integral to this entire process and who has been a
[21] Co-Chair of the President's process, along with
[22] Katie McGinty and Dan Tarullo, also with the

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[1] National Economic Council.

[2] And earlier, when Secretary Albright was
[3] here, I wanted to acknowledge the members of her
[4] team, my long-time colleague, Tim Wirth, who is
[5] here, also, Stew Eizenstat and others.

[6] And I want to thank everybody who has been
[7] a part of today's panels. It has been a very,
[8] interesting experience for those of us who have
[9] been able to participate in it. Many of you will
[10] be attending the reception a little bit later at
[11] the White House and I will look forward to seeing
[12] you there.

[13] Just in closing, let me express the hope
[14] that by listening to the evidence brought forward
[15] by the experts and the practical perspectives of
[16] non-experts we have all learned about the risks of
[17] global warming, as well as some of the approaches
[18] that will help us reverse it.

[19] As you take these thoughts home with you,
[20] please, continue to consider how you might manage
[21] the problem from your own perspective.

[22] President Clinton and I strongly believe

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[1] that we must build our economy and protect our
[2] environment all at the same time and that we can do
[3] that best by tapping the inventive ideas that arise
[4] in the minds of the American people.

[5] On behalf of the President, I want to
[6] thank Todd Stern and the team of people who have
[7] helped him in coordinating this. I think they have
[8] done an outstanding job. I want to thank all of
[9] you for coming and in closing would like to ask all
[10] of you to join me in thanking the members of our
[11] final panel.

[12] [Applause.]

[13]

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