CLIMATE CHANGE: PERSPECTIVES OF UTILITY CEOS

HEARING

BEFORE THE

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CLIMATE CHANGE: PERSPECTIVES OF UTILITY CEOs

TUESDAY, MARCH 20, 2007

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND AIR QUALITY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:08 a.m., in room 2123 of the Rayburn House Office Building, Hon. Rick Boucher, chairman, presiding.

Members present: Representatives Barrow, Waxman, Markey, Doyle, Harman, Gonzalez, Inslee, Baldwin, Matheson, Dingell, Hastert, Hall, Upton, Shimkus, Shadegg, Buyer, Walden, Myrick, Sullivan, Burgess, and Barton.

Also present: Representative Hill.

Staff present: Sue Sheridan, Bruce Harris, John Jimison, Lorie Schmidt, Laura Vaught, Chris Treanor, Margaret Horn, C.H. Bud Albright, David McCarthy, Tom Hassenboehler, and Matthew Johnson.

OPENING STATEMENT OF HON. RICK BOUCHER, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF VIRGINIA

Mr. BOUCHER. The subcommittee will come to order. This morning, our climate change hearing focuses on the Nation's electric utility industry, as we welcome to the subcommittee the chief executive officers of some leading coal-fired electricity generators. As we draft a greenhouse gas control measure, it is essential that we preserve the ability of electric utilities to utilize coal, our Nation's most affordable and abundant energy resource with a 250-year reserve.

If that ability is not adequately preserved, and in lieu of coal, utilities rely to a greater extent on natural gas, the resulting increases in natural gas prices would substantially harm the entire American economy. We are already losing tens of thousands of manufacturing jobs, notably in the chemical industry, but in other industries as well, to countries that have lower and more stable natural gas prices. Significant gas price increases would only worsen that job flight from the United States to other lands.

One-half of all homes in the United States are heated with natural gas, and the elevated prices that have occurred, largely because so many gas-fired electricity generators are now in use, has placed severe stress on the family budgets for tens of millions of Ameri-

cans. For the sake of those who heat with natural gas, we also must avoid placing greater stress on natural gas prices.

Much of American industry, from agriculture to the smelting of aluminum, is natural gas dependent and would suffer adversity if prices escalate. The key to avoiding those consequences is to draft our greenhouse gas control measure, so as to ensure that utilities that desire to do so may continue to use coal, to do so in the volumes in which they're using it today, and to preserve the opportunity for market for coal as a component of the overall fuel mix for electricity generation.

I look forward to the advice of today's witnesses about how the legislation should be structured in order to achieve those ends. I would also note that, with the leadership of today's witnesses, the trade association representing investor-owned utilities has announced the industry's intention to work with the subcommittee in drafting a control program of economy-wide application that does not dislocate any economic sector. I want to thank our witnesses for their role in developing that industry position, and I will look forward to working with each of you in order to achieve the result that is embodied within that position.

We are particularly interested this morning in the views of our witnesses regarding the potential for carbon capture and storage technologies to enable electric utilities to continue to rely on coal as the predominant fuel for electricity generation.

Several questions will be prominent in our discussion today. What do we need to do to provide, by way of Federal resources, sufficient funds to enable early deployment of affordable and reliable technologies? How much additional money for grants, for loan guarantees, for direct expenditures on research, development, and demonstration of these technologies will be required and over what time period?

Should we draft the schedule for the implementation of carbon controls to coincide with the arrival of reliable and affordable control technology? What do we need to do about the liability with respect to CO^2 that is injected into permanent storage in the event that it migrates beyond where it is supposed to be or escapes again into the atmosphere, or if other problems that might result in legal liability are encountered associated with that injection and storage? What other core concerns should we be aware of as we begin the exercise to draft this legislation during the latter part of the spring of this year?

I want to thank our witnesses for joining us this morning, and I look forward to their answers to these and other questions that will be propounded to them.

I am now pleased to recognize the ranking Republican member of the Energy and Air Quality Subcommittee, the gentleman from Illinois, Mr. Hastert, for an opening statement of 5 minutes.

OPENING STATEMENT OF HON. J. DENNIS HASTERT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. HASTERT. I thank the chairman, and Mr. Boucher, I also thank you for your leadership in this area. You called this meeting this morning to learn. It is crucial that we get the perspectives of

industry that will be most affected by any climate change legislation. Last week, we heard from the automakers.

This week, electric utilities, and over the course of these hearings, I hope we hear from other industries as well: the cement industry, the fertilizer industry, oil and gas, and other industries that will likely be affected by any action that we take here. Their perspectives are critical if we are to understand the consequences of legislation of any type that aims to reduce greenhouse gas emissions.

Electricity generation in this country is largely about coal. Nationally, 50 percent of our electricity comes from coal. In the Midwest and some other regions of the country, this percentage is much higher. But when we look at some where it is lower, we see the east coast where it depends on fuel oil coming from abroad or liquid natural gas from abroad where some country or some despot could turn the handle and cut that supply completely off.

Though we talk about energy independence, I believe it is important for us to remember that the United States is currently energy independent in one sector: the generation of electricity. Our abundant coal resources make this possible. Any plan that seeks to control CO^2 emissions must account for this reality. Failure to do so would make the U.S. dependent upon foreign sources of energy, namely LNG for getting electric power done.

This committee has heard testimony about the coal combustion and carbon capture and sequestration technologies that would be employed to reduce CO^2 emissions. And what did we learn? That carbon capture and sequestration technology probably wouldn't be widely commercially available or deployed for at least 30 years.

Of course, the technologies come with a price tag that is as yet unknown since no one is actually using them on a coal-fired power plant today. It is therefore important to get an assessment from the utility industry about their views on how they plan to meet future generation needs, the importance of maintaining a robust fuel mix, and the economic feasibility of deployment of carbon capture and sequestration technologies. We need to hear from them when they plan to deploy such technologies and how much this is going to cost the consumers.

Some of the witnesses before us today support cap-and-trade legislation. Of course, the prerequisite for such a plan to work is that we are able to cap. Now, I am personally convinced that I think the testimony presented to this committee bears this out, that we will develop over the next 20 years the technologies and capacities to economically capture and sequester CO^2 on a large enough scale to make a difference. In order to legislate rationally, we need to recognize the critical fact that this and related technologies will take time to develop and mature.

If we do not, cap-and-trade becomes cap-and-pray. I might say that "pray" might be spelled p-r-e-y. A plan whereby we cap carbon before it is technologically feasible to do so and pray it doesn't cost the consumers or the economy too much. A cap-and-trade scheme put in place before we had the technology capacity to control CO^2 emissions is simply a tax on the generation of electricity and will do nothing to reduce the Earth's average temperature.

Finally, I am interested in our witnesses' view on the necessity for the participation of developing countries, like China and India, in any global emissions reduction plan. China, for example, is building the equivalent of a 500-megawatt coal-fired plant every week. China very soon will become the world's largest emitter of greenhouse gas emissions. I personally do not see how a cap that doesn't include these countries will do much to limit world trade, greenhouse gas emissions, or lower the Earth's average temperature.

There are many things we can do that would help. We can push development of carbon control technologies. We can advance the use of biofuels. We can develop clean coal and coal-to-liquids technology, and we can ensure that these technologies are made available to the developing world. We cannot, however, wave a magic wand and make these technologies appear overnight. I think the bottom line is we want to make this country and this world a better and healthier place to live.

We also need to keep jobs and production and manufacturing in this Nation. If we push out the ability to manufacture, to create jobs, for our people and send them to China or India where they continue to build dirty plants, then we have no jobs and a worse ecology in this world to deal with.

Mr. Chairman, I thank you for the time, and I thank you for holding this hearing today.

Mr. BOUCHER. Well, Mr. Hastert, thank you very much for a truly thoughtful statement.

The gentleman from Georgia, Mr. Barrow, is recognized for 3 minutes.

The gentleman from Georgia waives.

I would note that pursuant to the rules of the committee, any member who waives the time allotted for an opening statement will have those minutes added to the time for questioning witnesses. The gentleman from California, Mr. Waxman.

Mr. WAXMAN. Mr. Chairman, I welcome our witnesses today, and I also waive my opening statement.

Mr. BOUCHER. Gentleman waives his opening statement. The gentleman from Pennsylvania, Mr. Doyle.

OPENING STATEMENT OF HON. MIKE DOYLE A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF PENNSYLVANIA

Mr. DOYLE. Thank you, Mr. Chairman. I would like to welcome each of you to the committee, as we all look forward to hearing your testimony regarding what your companies can do to join us in the fight against global warming.

As I have stated at previous hearings, we are long past the point of dueling scientists where, for every expert who testifies that global warming is real and manmade, another one is brought out to say the studies are inconclusive. We are at a point where we know what the problem is. We know what causes it, and we are beginning to discuss solutions that we can craft to correct.

A discussion of that solution has brought each of here to this committee. Each of you find yourself in a unique position when compared to other aspects of our American economy. On the one

hand, your companies contribute to global warming. On the other hand, your companies provide the energy backbone that allows our entire economy to prosper.

As a result, the question before us today is not if you are going to reduce your carbon dioxide emissions but how you are going to achieve this goal. In addition to your testimony about carbon sequestration and other pollution controls, I am particularly interested in your thoughts about a renewed national policy that would encourage the building of next generation nuclear capacity. Seems to me that because this is a discussion about emissions and the effect of greenhouse gases into our atmosphere, we must also have a frank discussion regarding the benefits of nuclear energy, an energy source that does not release greenhouse gases.

While nuclear energy does pose some other significant environmental questions, the fact that global warming is caused by gases being trapped in our atmosphere makes it relevant to this discussion. Simply stated, if the release of these gases is a cause, then a form of energy that does not release them is certainly a part of the solution. I look forward to hearing each of your testimonies.

I hope that we will hear some concrete, real-world suggestions as to how we can work together to reduce the impact of global warming. Two things are certain. Congress will act, and your industries will be among the industries most affected. I sincerely hope that we can work together to achieve the right mix of reductions, incentive, and innovation to achieve our common goal. I thank you, Mr. Chairman, and I yield back.

Mr. BOUCHER. Thank you very much, Mr. Doyle. The gentleman from Texas, the ranking member on the full Energy and Commerce Committee, Mr. Barton, is recognized for 5 minutes.

OPENING STATEMENT OF HON. JOE BARTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BARTON. Thank you, Mr. Chairman. I went upstairs. I thought this hearing was upstairs, so I have got my exercise for the day. I have a prepared statement, but I want to at least show, or maybe state, for the record my last two power bills. This one is from TXU Energy down in Texas. And down here at the bottom in tiny, tiny, tiny, tiny print, in fact you have to have a magnifying glass to read, it says "The average price you paid for electric service this month was 16.56 cents per kilowatt hour." 16.56.

I just got this. I opened my mailbox in Arlington, Virginia. I have a little condo. This in my Dominion Power bill, and in print that is a lot bigger for some reason, it says "The price to compare 5.96 cents." OK, now, Texas 16.56, Virginia 5.96. Which of these would you rather pay? Obviously the 5.96.

Now, the difference between those is that Texas has built almost every new power plant it has built in the last 20 years uses natural gas. Natural gas prices got up to about $14, 1,000 cubic feet last year. Now, they have come back down to about $8. TXU has yet to see fit to lower its price, but that is a whole other story.

But Texas became too dependent on natural gas and consumers' pain. Dominion, probably thanks to the good work of Chairman Boucher, who is now the chairman of this subcommittee, has got

a diversified power mix. But they produce over, I think, about 60 to 70 percent of their power from coal.

Right now, the differential between coal and natural gas is about 4 to 1. Natural gas is about four times expensive as coal. What relevance does that have to this hearing? We are in a frenzy to put a carbon tax on or regulate CO^2 or come up with some mandatory cap-and-trade system for carbon dioxide. And unless our future project works, which we won't know for another 8 or 9 years, if you burn coal, you are going to create CO^2.

If you tax CO^2, if you regulate CO^2, if you put a cap on it, it is going to be a lot more expensive. Now, in the European Union in Germany, their utility prices at wholesale went up 30 to 40 percent when the Europeans adopted their carbon cap-and-trade system, 30 to 40 percent. In our technology hearing last week, when we had all of the folks come in to talk about the new technology for using coal, the average price increase for the carbon sequestration and capture methods, the minimum was 25 percent. The average was over 50, and one was 100 percent.

Ladies and gentleman, unless everyone wants to pay 16.5 cents or 20 or 25 cents like they are paying in Hawaii and San Francisco, we need to tread very lightly on these mandatory systems for carbon capture and various other of these mandatory systems.

So I have a prepared statement, Mr. Chairman, that I will put in the record. Suffice it to say I am very pleased to have this panel. I honestly can say I know most of these gentlemen on a first-name basis. They are all fine Americans, patriots, and they have differences of opinion. And we are going to hear that, but that is what democracy is all about.

But I think it is a very important hearing today. The people that would have to implement some of these systems, to hear what they say about them. With that, Mr. Chairman, I yield back.

[The prepared testimony of Mr. Barton follows:]

PREPARED STATEMENT OF HON. JOE BARTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Thank you, Chairman Boucher, for holding this hearing today on utility perspectives on global warming. This is an important hearing because any global warming legislation that proposes to cut CO^2 levels will do it on the backs of the utility industry and its ratepayers. Particularly vulnerable will be the homeowners whose electricity comes from coal, even the ones who get power produced by the latest clean-coal technology.

We have a responsibility to the people who work for a living and pay their electric bills. Part of our responsibility is to guard against laws that would make electricity so expensive that cooking and heating become a luxury. And when our colleagues propose legislation that will produce no discernable environmental benefit, but will surely cost working people their jobs, it's our job to say no.

Today we have more representatives of the USCAP group. We heard from three members of this group at our first hearing several weeks ago. At that hearing, the Pew Center seemed to be the stand-in for the electric utility industry. I'm glad we will hear from the industry directly today.

I also want to welcome CPS Energy from San Antonio. CPS Energy is a municipal utility that makes no profit and is directly accountable to its ratepayers, rather than its shareholders. It relies heavily on coal to generate its electricity. That perspective is important for us to hear.

This committee is embarked on a fact-based exploration of global warming issues.

Much of the call today for global warming legislation includes a mandatory cap on CO^2 emissions and a complex trading scheme for CO^2 emissions allowances. Allegedly, this will make compliance somehow cheaper. So far, we have not heard any

hard facts to support this claim. Proponents have given us hypotheticals with no hard numbers. They did agree that it would not be free.

The only hard numbers based on real-world experience that we have heard was the German experience with the European Emissions Trading Scheme. There, wholesale electric rates went up by 40 percent after the trading scheme was implemented. I'm not sure that there will be any environmental benefit from the European system because most European nations are going to exceed their CO^2 caps, and China, India and other non-OECD nations will exceed Europe. The evidence so far is not promising that a cap-and-trade scheme is worthwhile. Perhaps that is one reason that Speaker Pelosi has acknowledged that we won't we doing a cap-and-trade by the 4th of July, after all.

I see a lot of industries now lining up behind a cap-and-trade system, despite the evidence from the European experience. I think they believe there is money to be made in CO^2 trading. In fact, I've heard that argument in this room.

Here's some other news that shows what the future in America might be like under a cap-and-trade system. After requiring companies to cap-and-trade, the governments of Sweden and Finland are both dabbling with windfall profits taxes on companies that did what they were told, but just a little too well. I guess no good deed goes unpunished. You can bet that if U.S. companies start to make profits on CO^2 trading, the same Members of this Congress who called for windfall profits taxes on oil company profits will call for new taxes on CO^2 trading. They raised taxes and fees on domestic oil production already, so the pattern is clear.

I hope today's witnesses will be able to tell us what they think a cap-and-trade system will mean for their ratepayers and shareholders. Who gets the benefits? Is the technology for CO^2 reduction available? When and at what cost? What are the environmental benefits, particularly if China and India are not participants in any international cap-and-trade system? These are the hard facts and numbers we need before we legislate on any global warming legislation. I hope we get some answers today.

Thank you, Mr. Chairman.

Mr. BOUCHER. Thank you very much, Mr. Barton. The gentleman from Texas, Mr. Gonzalez, is recognized for 3 minutes.

OPENING STATEMENT OF HON. CHARLES A. GONZALEZ, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. GONZALEZ. Thank you very much, Mr. Chairman. First of all, as we attempt to craft some sort of legislation, and we don't know to what degree or extent we are going to have something ready in the next few months, my concern, of course, is that we do it with the reality that faces us.

And what is that backdrop when it comes to coal-fired plants? The reality is, of course, we have got one that is coming online as we speak, and I was reading an article the other day. And it represented that you will have 40 new coal-fired plants within 5 years and 150 new coal-fired plants by 2030. That is the reality. That is the backdrop, and whatever we do, how is that going to impact the construction of these particular coal-fired plants and their ability to provide energy to, obviously, our constituents.

We have had many different witnesses as we have this accelerated, expedited schedule that represent different stakeholders. We don't really hear from the consumer. They are not organized. They don't really have advocacy groups and so on, but that is truly our job up here as representatives of our individual districts.

Keeping that in mind, what I wanted also, with the indulgence of the chair and of course using up my own time, I wanted to welcome one of our witnesses, which obviously is someone locally from San Antonio and the general manager and CEO of City Public Service Energy, Milton Lee. I wanted to welcome him this morning. I appreciate the fact that he made himself available to testify,

which is a brave thing to do, Milton, when you think in terms of the questions that you are going to be fielding.

Hopefully, he will lend some real insight as to the San Antonio experience, and, of course, the plans to build the new coal-fired plant, but also the expertise that you have brought in the past 6 years. You were at Austin Energy previous to your service in San Antonio, and that expertise is reflected by a very efficiently-run, publicly-owned municipal utility and the diversification, as far as sources of energy, which I hope that you will touch on in your testimony. Welcome, and with that, I yield back.

Mr. BOUCHER. Thank you, Mr. Gonzalez. The gentleman from Texas, Mr. Hall, is recognized for 3 minutes.

OPENING STATEMENT OF HON. RALPH M. HALL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. HALL. Mr. Chairman, I will just be very brief. I think I am not telling this fine array of members of Energy Committee that today we are observing a major attack on energy, period. And to me, other than the word prayer, the word energy is probably the most important word in the dictionary for our children and our grandchildren, who we'll send overseas to take some energy away from people, when if we could just use energy we have right here at home, could prevent a war for them.

And that is what it is all about, and I remember in boxing, you have always heard boxing managers and promoters say kill the stomach, and the head will die. Well, all of these punches are stomach punches, and they are trying to kill the stomach now. And the head is global warming, and for the global warming to work, a lot of people's brain has to die because nobody is talking about anything that has to do with what it costs and what it will take and how we will send jobs to the worst polluter in the world, who is going to pay absolutely nothing.

Mr. Vice President, what about China? What about Russia? What about Mexico? What about India? Who is going to pay for this mass array of funds for something that we don't know if going to happen? We are not positive it is going to happen. Major people who are much more intelligent than I am and made 20 grade points in college have an idea about it, and not a small minority of them have different ideas.

Thank you for giving us your side of it. I am anxious to hear it, and I yield back my time. But remember there is a major assault in this country by people who want a plaque on the wall. No, they are not going to get a bill against energy. I yield back.

Mr. BOUCHER. Thank you very much, Mr. Hall. The gentleman from Washington State, Mr. Inslee, is recognized for 3 minutes.

Mr. INSLEE. I will waive, Mr. Chairman.

Mr. BOUCHER. Gentleman from Washington waives. The gentle lady from Wisconsin, Ms. Baldwin, is recognized for 3 minutes.

OPENING STATEMENT OF HON. TAMMY BALDWIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WISCONSIN

Ms. BALDWIN. Thank you, Mr. Chairman. Today's hearing focuses on one of the main components of our debate on climate

change, the electricity sector. As has been echoed numerous times, our Nation's electric utilities release a large portion of the total carbon dioxide emissions released in the atmosphere, with coal representing the largest single source of carbon dioxide emissions.

As Americans, we are dependent on the electricity our Nation's utilities provide. We are accustomed to expect reliable, affordable service on demand. As such, it is clear that the companies represented before us today play an important role in our everyday lives, but the question remains: What role will you play in our future for generations to come?

Scientists have told us loudly and clearly that the Earth is warming at an unprecedented rate and that human activities are largely the cause. The scientists have sounded the alarm that we must act now to slow, stop, and reverse the growth of greenhouse gas emissions. And the electricity industry will have to be a large part of our response.

Now, I agree that we must reconcile the demand for affordable and reliable service with the goal of reducing greenhouse gas emissions from electricity generation. And I believe it is possible for us to take such action without worry that the lights will turn out but only if we commit to smart, aggressive initiatives that protect our constituents, our Nation, and our planet from the harmful effects of global climate change.

In my home State of Wisconsin, we face real challenges when it comes to addressing our power supply. We are increasingly dependent on coal, and as a result, emit greenhouse gases at a rate that is about one-third higher than the national average. The people of Wisconsin understand the consequences of that dependence, and as a result, they are willing to meet the challenges of reducing our impact on the world.

For instance, Wisconsinites supported our State's renewable portfolio standard that requires our utilities to use renewable energy to meet part of its electricity demand. And as a result of this action, by 2015, Wisconsin will avoid emitting about 5.5 million tons of greenhouse gas pollution.

On a national level, we have a very difficult task ahead of enacting meaningful legislation that will push the envelope in terms of creating efficient, effective, and environmentally-friendly climate change programs. But it can be done, and with your cooperation, your ingenuity, and willingness to take bold action, we can bring about change.

Thank you, Mr. Chairman. I yield back the balance of my time.

Mr. BOUCHER. Thank you very much, Ms. Baldwin. The gentleman from Michigan, Mr. Upton, is recognized for 3 minutes.

Mr. UPTON. I am going to defer, Mr. Chairman.

Mr. BOUCHER. Gentleman from Michigan waives his opening statement. The gentleman from Illinois, Mr. Shimkus, is recognized for 3 minutes.

OPENING STATEMENT OF HON. JOHN SHIMKUS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. SHIMKUS. Thank you, Mr. Chairman. I will try to be brief also. Last night, I had a tele-townhall meeting where we try to contact over thousands of my constituents. We actually ended up over

500 folks on the line, and I took questions for about an hour. Not one question on global warming or climate change.

However, Chairman Barton and Mr. Gonzalez, I did get numerous questions about electricity prices and energy bills, especially from Illinois, where we have moved to "a competitive market" and we have seen anywhere from 50 to 100 percent to 300 percent increase in energy costs.

I will submit to you that once consumers start receiving the bill, consumers will talk to us. And whether it is any venue, it will not be a pleasant conversation because it will be lost jobs. It will be higher prices. It will be slow economic growth, and it will be devastation for this country.

Make no mistake. We are talking about major costs being passed on, either through a tax increase, which the UK just did, and that is not good enough. Or it is going to be increased costs of the price of doing business. You can't cap this depiction on how much we rely on coal to meet our energy demands because our energy demands are not going down. They are going up. So the laws of supply and demand would say that we are in deep trouble on this cap-and-trade.

The more I attend these hearings, the more I understand, and I am very quizzical that we human beings think we can affect world climate. If you are an evolutionist, the world has swung through climate changes 33 different times in the evolution of this planet. Thousands and thousands of those years, man was not here and had no effect, either a glacier age or a warming. Some would argue this planet is carbon-starved if you really go to the science.

Now, if that is the premise, if you really talk about the evolution—I'm a creationist. So I believe God is in control. I don't care what we do, but if you are in the evolutionary scientific model, the planet balances itself out. Man cannot balance this. We are not going to have the impact on this effort, and the issue will be at what cost. And I think the cost will be devastating.

Thank you, Mr. Chairman. I yield back.

Mr. BOUCHER. Thank you very much, Mr. Shimkus. The gentleman from Massachusetts, Mr. Markey. Mr. Markey waives his opening statement.

The gentleman from Michigan, the chairman of the full committee, Mr. Dingell, is now recognized for 5 minutes.

OPENING STATEMENT OF HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. DINGELL. Mr. Chairman, I thank you. I also commend you for the vigor and diligence with which you are addressing the problem that is before the committee. To our witnesses, thank you for being here. I hope you feel welcome, and I would observe that each of your companies has a significant stake in the business of producing and providing to its customer electricity produced from our country's most abundant generation source: coal.

As we have learned in the subcommittee's hearing today, coal accounts for nearly 50 percent of the Nation's electricity mix and is thus, critical to our energy security and independence. The U.S.

has heavily relied on coal, and no one seriously argues that we will not continue to need this fuel source to meet our future needs.

Yet it is equally clear that coal faces challenges as the U.S. searches for ways to reduce carbon emissions. The subcommittee's March 6, 2007, hearing examines some of the difficulties and the opportunities for using coal more cleanly, and nearly every week, a new study on the topic comes forth.

The subcommittee is fortunate to have among today's witnesses a number of companies that rely on coal and are seeking answers to the same questions that we seek, and that is how to maintain and improve the service to customers while at the same time, being good stewards of the environment.

The witnesses today include chairmen of companies that have called for legislation to limit carbon emissions, a goal that you, Mr. Chairman, and I are working towards. Others are still formulating their positions, and we will be indeed welcoming their testimony as to the questions they confront and how they plan to limit the production of greenhouse gases.

I note that yesterday was the date on which you, Mr. Chairman, and I requested responses to a letter we sent last month asking questions about greenhouse gas legislation. The responses, I note, are now coming in, and I want to thank our witnesses and the organizations to which they belong for the hard work which they put into these submissions. I am sure that the information will be very helpful to the committee in its future deliberations.

With that, Mr. Chairman, I thank you for your recognition. I welcome our witnesses, and I look forward to their testimony. Thank you, gentleman. I yield back the balance of my time.

Mr. BOUCHER. Thank you very much, Chairman Dingell. The gentleman from Oregon, Mr. Walden, is recognized for 3 minutes.

Mr. WALDEN. Mr. Chairman, I intend to waive and take my time in the questions.

Mr. BOUCHER. The gentleman from Oregon waives his opening statement. The gentleman from Texas, Mr. Burgess, is recognized for 3 minutes.

OPENING STATEMENT OF HON. MICHAEL C. BURGESS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BURGESS. Thank you, Mr. Chairman. I, too, want to thank you for holding this hearing today, and Mr. Lee from San Antonio, you are not my part of the State, but any part of Texas is good to see on this panel. You know the challenge we have ahead of us as so many Yankees move to our State, and we have got to keep them cool in the summertime. So what you guys do is critically important.

Well, 2 weeks ago, this subcommittee held a hearing on carbon capture and sequestration. We heard from a variety of witnesses regarding the status of the technology and what steps must be taken for full-scale deployment. And we also heard about the potential costs. Last week, the Massachusetts Institute of Technology released a report entitled "The Future of Coal" which examined the role of coal in a carbon-constrained world. Much of the report focused on the technological, regulatory, and infrastructure chal-

lenges that stand in the way of commercial deployment of carbon capture and sequestration.

I had hoped that our subcommittee would hold the carbon sequestration hearing after the report had been released so that we might have had the benefit of their expertise during the hearing. But nevertheless, and never constrained as before, I am pleased to have the CEOs of many of our country's leading electricity companies before us here today to share their perspective.

One question that I would like to hear answered by our group in front of us is what would happen if carbon dioxide emissions were capped and affordable carbon capture and sequestration technology was not available. In their written statements, most of our witnesses emphasized the importance of having carbon capture and sequestration technology commercially available in order for a cap-and-trade policy to work.

As we have already learned, we are not at that point right now. Carbon capture and sequestration technology won't be widely available for another 40 years. That is a long time to trade credits before there is a technological alternative to credits. Since most of our witnesses today expressed support for mandatory cap-and-trade system, I look forward to hearing how they reconcile their support with the current state of our technology.

And, Mr. Chairman, I am going to yield back a full minute.

Mr. BOUCHER. Thank you very much, Mr. Burgess. The chair greatly appreciates that gesture. And now recognizes the gentle lady from California, Ms. Harman, for 3 minutes.

OPENING STATEMENT OF HON. JANE HARMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Ms. HARMAN. Thank you, Mr. Chairman, and welcome to our witnesses. I want to also join the chorus about coal. It is a form of energy we need in our future, but obviously we need to drive technology so that we can find the way to produce truly clean coal.

The utility companies represented here today are caught in a catch–22 it seems to me. On one hand, power production is responsible for the lion's share of our Nation's greenhouse gas emissions, approximately 40 percent. On the other hand, your businesses sell power, and the more you sell, that is at least using the most current technology, the more carbon you emit, the more money you make.

The solution is not to tell you how much money you can or cannot make. The solution is to create adequate incentives for your companies to invest in energy efficiency and to produce efficient and clean energy for our Nation's needs. In California, we have been doing this for decades with a short, ill-fated experiment in deregulation. And that is because power companies' profits in my home State are not tied to how much energy Californians use. As a result of this decoupling, energy producers investments in efficiency pay dividends. And this investment is far cheaper than planning and building new power plants.

Now, I am not suggesting that decoupling is a magic answer, but it does work in California, and the results are telling. The average American uses 12,000 kilowatts of energy per year, but the average Californian uses 7,000. This latter figure has held constant over 30

years, while energy usage among average Americans has increased by 50 percent. Best of all, we Californians emit 30 percent less carbon dioxide, per capita, than we did back then. Efficiency is paramount.

I recently introduced a bill to drive technology in producing efficient light bulbs. Clearly that is a smaller topic, and the light bulb producers are all welcoming this kind of push. So our goal here, Mr. Chairman, I think is to figure out how we can reach a common cause in driving your efficiency, push you to cleaner and cleaner energy production, and find a solution not just for America but for this huge problem that the world faces.

Thank you, and I yield back.

Mr. BOUCHER. Thank you very much, Ms. Harman. The gentleman from Indiana, Mr. Buyer, is recognized for 3 minutes.

Mr. BUYER. I will waive.

Mr. BOUCHER. Gentleman waives his opening statement. The gentleman from Arizona, Mr. Shadegg, is recognized for 3 minutes.

OPENING STATEMENT OF HON. JOHN B. SHADEGG, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA

Mr. SHADEGG. Thank you, Mr. Chairman, and thank you for holding this important hearing. I look forward to the testimony of our witnesses. I am extremely pleased to see David Sokol and to have mentioned in his prepared remarks the theme I think we need to hit upon, which is nuclear energy. I recently note that Senator McCain of my State says he doesn't like following the French in many things, but he thinks with regard to energy production, perhaps they have it right.

As we look at the challenges of climate change and of the emissions of greenhouse gases, I believe nuclear has to be a part of the equation, and I think it is important that we get started with that effort as quickly as possible.

I also agree with you, however, Mr. Chairman, and with the previous speaker that coal remains an important part of our overall future. And I am very anxious to hear what the executives who are with us today propose to do with regard to continuing our reliance on coal and our use of coal but doing it in the clean and appropriate manner that the previous speaker just mentioned.

I believe that too many people are discussing the notion of cap-and-trade as the only viable solution of trying to limit greenhouse emissions. I do not believe that it holds that potential. I think the experience in Europe has demonstrated that cap-and-trade may, in fact, not work at all and that creating such a market may be more challenging and may in fact appear to solve the problem without really doing so. I believe that this is a very important challenge for us as a Nation. I look forward to hearing the testimony of our witnesses and hope they will bring us encouraging news on what they hope to do. But I would reemphasize that I believe nuclear has to be part of the solution

With that, Mr. Chairman, I yield back.

Mr. BOUCHER. Thank you very much, Mr. Shadegg. The gentleman from Utah, Mr. Matheson, is recognized for 3 minutes. And the gentleman waives his opening statement.

I believe all members have now been recognized for opening statements except for the gentleman from Oklahoma, Mr. Sullivan, who just arrived. The gentleman is recognized.

Mr. SULLIVAN. I'll waive.

Mr. BOUCHER. The gentleman waives his opening statement. The gentleman from Indiana, Mr. Hill, who is a member of the full committee but not a member of the subcommittee has joined us for the hearing. And we would be happy to entertain an opening statement from you, Mr. Hill.

Mr. HILL. Well, I don't have an opening statement so I won't take much of your time other than to acknowledge Jim Rogers who is here with Duke Energy. He and I had a very good discussion about this very important issue that you are addressing here this morning. I am glad to welcome Mr. Rogers here to this hearing.

Mr. BOUCHER. Thank you very much, Mr. Hill, and we are pleased to have you participate in our hearing this morning. We have a very distinguished panel of witnesses who will inform the subcommittee this morning about their views, and I want to welcome each of them to the subcommittee and let you know how much we are looking forward to your testimony. I will introduce briefly each witness, and we will then proceed, beginning with Mr. Sterba, to receive testimony. Mr. Jeffry Sterba, is the chairman, president, and chief executive officer of PNM Resources in New Mexico. James Rogers is the president and chief executive officer of Duke Energy Company. Mr. David Sokol is chairman and chief executive officer of the MidAmerican Corporation. Michael Morris is chairman, president, and chief executive officer of American Electric Power. Jack Reasor, who I am pleased to note is a former constituent of mine and a former member of the Virginia State Senate, is the president and chief executive officer of Old Dominion Electric Cooperative, a major electric utility generator of electricity in Glen Allen, Virginia. And Mr. Milton Lee is the general manager and chief executive officer of CPS Energy Company in San Antonio, Texas.

I want to say a welcome to each of our witnesses and note in this introduction that each is a major user of coal and a principle coal-fired electric utility. Many of our witnesses also took a leadership role in developing the position of the Edison Electric Institute, the trade association for investor-owned utilities in support of working with this subcommittee as we seek to structure an American response to the challenge of climate change. We appreciate that position. We appreciate your being here with us this morning.

Without objection, your prepared statement will be made a part of the record, and we would welcome your oral summary of approximately 5 minutes. Mr. Sterba, we will be pleased to begin with you.

STATEMENT OF JEFFRY E. STERBA, CHAIRMAN, PRESIDENT, AND CHIEF EXECUTIVE OFFICER, PNM RESOURCES, INCORPORATED, ALBUQUERQUE, NM

Mr. STERBA. Good morning, Chairman Boucher, Congressman Hastert, and members of the subcommittee. Based on your leadership, I almost wanted to say I waive, but I won't do that.

In 2004, the electric power sector reported 282 million metric tons of CO^2 equivalent emission reductions. This represented over 63 percent of all reported voluntary reductions in that year. While our industry's voluntary programs have achieved meaningful reductions, I believe it is time to do more to address climate change, at least as an insurance policy for the future.

We need Federal legislation that is environmentally effective, economically sustainable, and fair. And we cannot make significant long-term reductions without seriously addressing the need to fund and advance technology that can provide a robust and diverse portfolio of carbon-friendly alternatives. This needs to include energy efficiency, advanced coal, renewables, nuclear, carbon capture and storage, and plug-in hybrids. The removal of any one of these options impacts our ability to be serious about the challenge.

Federal legislation should engage all sectors of the economy and provide leadership globally. The current path, which seems to be one of State action, is unsatisfactory because it will create a patchwork quilt of inconsistent and conflicting elements.

We need to aggressively fund research, development, demonstration, and deployment so that we can bring carbon capture and sequestration technologies online as soon as possible. It is not just technology availability, but the necessary policy facilitation. This includes addressing licensing, citing, and reliability issues.

And not just the storage facilities themselves, but also the transportation infrastructure to get the material from where the generation is located to where it must be placed underground. And if mandatory emission reduction targets and timelines are not in sync with the commercial timeline and construction and permitting of these technologies, we risk massive switching to natural gas and associated increase in gas prices that greater demand will create.

I am not saying that we need to wait to begin reducing our carbon footprint until these technologies are fully deployed. There are a number of things, what you would call low-hanging fruit, that can be done now. Energy efficiency measures are at the top of this list and can achieve significant reductions immediately and cost-effectively. And they can also save Americans money.

For example, if every American home replaced just one light bulb with a compact fluorescent, we would save enough energy to light more than two and a half million homes for a year and prevent greenhouses gases equivalent to the emissions of nearly 800,000 vehicles.

We can also modify existing plants to be more efficient and increase their capacity with virtually no additional fuel input, effectively creating very low emission generation. But certain environmental regulations, the new source review for example, may need to be modified to enable these improvements.

I would ask this subcommittee to consider an overall architecture for a comprehensive climate change bill, which, one, accounts for the global dimension of climate change through U.S. participation in negotiations for a post–2012 international framework. Two, provides for policy initiatives that will fundamentally change the way we produce and use energy. This will require us to establish a national technology roadmap that includes an aggressive research development, demonstration, and deployment program targeting a

full suite of carbon-friendly breakthrough technologies and long-term stable funding that is not subject to the vagaries of annual appropriations. Three, to be cost-effective and allow for economic growth while achieving meaningful emissions reductions. Both objectives can be achieved through an economy-wide Federal cap-and-trade program that sets mandatory emissions reduction targets but must allow a slow, stop, and reduce strategy over the next 50 to 100 years. I believe it also must include cost control mechanisms that do not undermine ultimate environmental goals but prevent adverse economic impact during the initial transition and enable a long-term price signal for major capital projects, such as a safety valve. When I am making a technology decision about a new resource, I don't care what the carbon price is today. What matters is what is it 10 years from now, 15 years from now, on the basis of the technology that I will be installing. And so if we have an unconstrained carbon price in the near term, when we don't have this technology, the only thing that will happen is I and my customers will pay more and probably make the wrong decisions for the long term.

Further, legislation should not create winners and losers among generation resources, particularly with respect to existing resources, but rather promote all types of fuel sources and recognize the disproportionate impact mandatory reductions will have on certain regions and existing resources.

Ultimately, the goal should be to create an economically sustainable and environmentally appropriate addressing of the climate change issues. With that, Mr. Chairman, I end my comments.

[The prepared statement of Mr. Sterba appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Sterba. Mr. Rogers, we will be pleased to hear from you.

STATEMENT OF JAMES E. ROGERS, PRESIDENT AND CHIEF EXECUTIVE OFFICER, DUKE ENERGY COMPANY, CHARLOTTE, NC

Mr. ROGERS. Chairman Boucher, Congressman Hastert, and members of the committee, I would like to thank you all for inviting us here today to share our thoughts on how to design a fair effective greenhouse gas bill that puts us on a path of decarbonizing of our economy without causing economic dislocation, particularly in the regions so dependent on coal.

My name is Jim Rogers. I am CEO of Duke Energy, Charlotte, North Carolina. We are the third largest investor-owned utility in the United States. We serve nearly 4 million customers in five States: Indiana, North Carolina, South Carolina, Ohio, and Kentucky. And almost 98 percent of our electricity comes from coal and nuclear plants. We are the third largest consumer of coal, so I speak as a representative of a company with much at stake in this debate.

I am struck today by the common threads that run through the testimony you have seen and heard from the power industry. We are engaged and ready to work with you. We want the same things you want. Like you, we are concerned about what kind of planet we are leaving for our children and for our grandchildren. And like

you, we seek a policy that inspires innovation and efficiency but does not place too heavy a burden on our customers and our economy. All of us agree on an economy-wide approach.

I know this sentiment is shared by every economist I have seen who has commented on this issue. And importantly, just last week, the auto industry, which represents a third of our Nation's emissions said the same thing. All of us favor a system that uses market-based principles that establish a moderate price signal.

As we look back to 1990 and the history since then, no one can deny the success of a cap-and-trade system in reducing sulfur dioxide and nitrogen oxides economically and fairly. In my judgment, an economy-wide cap-and-trade system would establish a single price signal for carbon, providing the framework for economic compliance decisions and driving the development of new technologies.

We all have emphasized the need for our industry to employ the full range of options available to reduce our carbon footprint. They include renewables, nuclear, energy efficiency, and clean coal. We must work together to remove the regulatory roadblocks that have impeded the full potential of these technologies, especially with respect to energy efficiency.

Finally, there is a sense of urgency at this table focused on the need for a real, sustained commitment to developing and deploying new clean coal technologies. We look to Congress to accelerate the research and development of low to zero-emission technologies and to partner with the private sector in addressing risks as we move to deploy.

Everyone here agrees it is critical to our Nation's long-term energy security goals to keep coal in the Nation's generation mix for decades to come.

As this map shows, wide regions of the country, including much of the manufacturing belt of the Midwest, the fast growing Southeast and Southwest, and the farm belt depend on coal for their electricity needs. Customers in all these States will bear the deepest and most costly reductions, a disproportionate burden that Congress can address as it did with SO^2 and The Clean Air Act amendments of 1990.

And the politics of this issue is really embedded in that map. If you look at the States who are dependent on coal and those that are not, that gives you, in my judgment, an insight into this issue as it unfolds. We have urged you to remember climate change is a long-term challenge and that the emissions reduction path you propose should be based on a slow, stop, reverse strategy that saves the deepest reductions for later. Let me underscore this—saves the deepest reductions for later when technology is available.

This is not a retreat from our commitment. It is a reflection of our view that we ought to do what is possible now and not set goals that feel good, but are unachievable. We need to set goals that are achievable.

You all have a big job ahead of you. There is no environmental question more important than climate change, and no answer more complicated. While we all hope you find consensus in this Congress, we understand your decision will have a great bearing on the economy, and you need to be sure.

I would urge you however to do something. If a cap-and-trade is not right today, seek consensus on some first steps. Consider a carbon registry. Provide for credits for early action. Find ways to speed up development in new clean coal technology, especially carbon capture and storage. We need clarity as to rules and regulation for the storage of CO^2. It could take a long time to develop the legal obligations and liabilities associated with the transportation and storage of CO^2.

Encourage the States to move on regulatory reforms to spur energy efficiency and the adoption of renewable portfolio standards, and the States are well on the way with 22 States having adopted renewable portfolio standards. Look carefully at some of the specific policy tools and measures in Jeff Sterba's testimony and David Sokol's testimony. They really kind of focus on things we can do up front.

Lastly and in conclusion, I would say our climate challenge is heightened by the fact that as we look out, we are projecting a 40 percent increase in the demand for electricity in the U.S. by 2030. We must meet this challenge with available, affordable, reliable, and a clean supply of electricity. This is job one for me as CEO of Duke, and it is job one for our industry.

I look forward to your questions today, and I look forward to working with each of you all in the months ahead. Thank you all very much.

[The prepared statement of Mr. Rogers appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Rogers. Mr. Sokol, we will be pleased to hear from you.

STATEMENT OF DAVID SOKOL, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, MIDAMERICAN CORPORATION, OMAHA, ND

Mr. SOKOL. Thank you, Mr. Chairman. I am Dave Sokol, chairman and CEO of MidAmerican Energy Holdings Company which has energy assets in 20 U.S. States and around the world serving 7 million end-use customers. Our highly diverse generating mix includes one of the largest renewable energy portfolios in the country, as well as coal, hydro, nuclear, and natural gas-fired assets. Additionally, we have already reduced our carbon intensity by 9 percent since 2000.

I commend you for the series of vigorous hearings that you have scheduled. No one should underestimate the challenge of developing a strategy for effectively decarbonizing an economy that has relied on carbon-based fuels to drive more than two centuries of economic growth. Let us not kid ourselves. It is going to cost a great deal to move to a low-carbon world, and those costs will fall squarely on utility customers from family on fixed income, to small business and industrial customers.

And it is essential to understand that the devil is clearly in the details. If you adopt a plan that fails to take technology development into account, but instead imposes arbitrary timelines with unknown economic impacts, you will place upon every American the largest unfounded mandate in U.S. history.

Well, how then can we move forward? We believe that a phased-in technology and policy-driven approach provides the tools nec-

essary to successfully reduce long-term global greenhouse gases while minimizing the cost and the risks to our country. Transitioning to a low-carbon economy cannot take place overnight, but there are measures we can undertake now that will place us on the right path.

In the first phase, we suggest technology development and market transformation activities. Specifically in the electricity sector, we propose the following: adoptions of a flexible, renewable and clean technology portfolio standard, more stringent energy efficiency mandates, policies to encourage efficiency improvements at existing facilities, a 10-year multibillion dollar public/private research and development program for emissions reduction, removal of the legal and regulatory barriers to the deployment of new technology, such as carbon sequestration and new nuclear development, and lastly, tax policies to support these programs, such as the long-term extension of renewable tax credits.

In the second phase, as technologies become widely available, we suggest a hybrid system of phased-in emissions reductions based on carbon intensity targets, together with trading and safety valve pricing mechanisms. With this design, we will begin to gain certainty around the emissions reductions available, while the safety valve will provide the necessary certainty regarding cost.

Any allowance allocation scheme must be based on historical emissions. Providing allowances to non-emitters based on the so-called output-based methodology will simply create large and distorted wealth transfers unrelated to the overall goal of emissions reduction. By using this transitional glide path, the U.S. should be poised for dramatic reductions in the third phase beginning around 2030. A mandatory domestic program must also include flexibility measures allowing future congresses and presidents to adjust requirements based on periodic reviews of climate science, technology development, economic impacts, and international cooperation.

If I may, let me leave you with five clear messages. First, don't pick winners and losers. Our country's fuel mix today is based on decades of economically rational decisions approved by State public utility commissions and municipal utility boards. No one should be penalized for past actions that were deemed both lawful and prudent at the time.

Second, funding technology research and development is absolutely essential. President John F. Kennedy told a joint session of Congress in May of 1961 that America should commit itself to the goal, before that decade was out, of landing a man on the moon. Does this analogy apply to our global climate change challenge? Well, in 1961, President Kennedy had a space program, rockets, and a Congress committed to fund necessary technology. Today, we have neither. Federal spending on energy R&D has decreased 85 percent since the 1980s.

Third, failing to take technology development timelines into account could result in enormous unintended consequence such as fuel shifting from coal to natural gas, which already faces tight supply/demand imbalance and deliverability constraints. And further would promote emission shifting through industry relocation to countries without carbon controls.

Fourth, the end consumer, our customer, your voter, must be thoughtfully protected in this debate because it is they who will pay the price of such legislation through their heating and electric bills at the gas station and through virtually every expenditure they make.

Lastly, I would like to raise a cautionary note about the cap-and-trade concept. It is a regulatory mechanism that mandates reductions, and it says essentially let the market figure it out. Cap-and-trade can be a useful tool, but it is not a panacea. It does not supply emissions-free power. It does not develop nor bring new technologies online. It does not reduce prices for renewable energy resources. It merely raises the price for carbon-based emissions.

The SO^2 trading system created by the 1990 Clean Air Act amendments is rightly viewed as a success. But reducing carbon dioxide emissions, as I explained in my written testimony, is far more complex. A detailed legislative outline of our proposals included in our written testimony, which I hope will prove useful to the committee. And we would be pleased to answer any questions at the end of the comments.

[The prepared statement of Mr. Sokol appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Sokol. Mr. Morris, we will be happy to hear from you.

STATEMENT OF MICHAEL G. MORRIS, CHAIRMAN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, AMERICAN ELECTRIC POWER, COLUMBUS, OH

Mr. MORRIS. Thank you, Mr. Chairman and Mr. Hastert and other distinguished members of the subcommittee, particularly my good friend Joe Barton from the great State of Texas, Fred Upton from the great State of Michigan, and others who I have known well, including you, Mr. Chairman. Thanks for the opportunity to be here with you.

Since we are all talking a bit about who we are, I might share with the panelists who aren't familiar with American Electric Power that we are, in fact, the largest burner of coal in the western hemisphere. We serve customers in the north from Michigan, to the south in Texas, in the east of Virginia, and the west to Oklahoma. There are 5.1 million customers in that 11-State footprint.

Seventy percent of our 38,000 plus megawatts of generation capacity are fired by coal. We think it is essential that we have the opportunity to share with you some of the challenges that we see and some of the processes that we believe can be implemented to address the very important challenge that you all spoke to in your introductory remarks.

Let me make three particular points. First, the dual nature of the global warming challenge. Second, the true technology challenges are in front of all of us as an industry and as a country. And lastly, the ultimate implementation process and the significance that it has on many of us who struggle with this challenge as we go forward.

By the dual nature of global warming, I mean to speak first to the environmental issue. It is global warming. It is not American Electric Power warming. It is not U.S. warming. It is clearly global

warming, and to the comments that many of you made in your own opening statements, we need to see to it that other nations join us in this endeavor if we hope to be successful. Clearly, if the developing countries of China, India, Brazil, and others do not join in this endeavor, we will have had no impact on the environmental aspects of global warming.

Let me move now for just a moment then to the economic impact. When we think of this issue, we are looking here at a trade issue. We are looking at a jobs issue. What I hope this committee doesn't do, with the help of many of us who are trying to be helpful, is to create the jobs elimination bill of 2007–08. We simply can't visit that upon ourselves.

We believe there are two unique ways to approach that issue. As some of you may have seen, Ed Hill, who is the president of the International Brotherhood of Electrical Workers, thousands of blue-collar jobs, relatively high-paying, joined me in an op-ed not long ago on the issue of the potential to implement a tariff on countries who bring products into our Nation in a competitive sense without any environmental costs because they have chosen not to do anything about the issue in their homeland. We think that this is one way that we might be able to do that.

Another is to learn from our friends in the European Union who most recently spoke to the issue of setting a target with a timeline and a commitment, which would be reduced and the target line extended if other nations didn't join the European Union in that endeavor. We think that both of those are meritorious steps to take when you consider the economic side of the issue of global warming.

Second, the technological challenges that are in front of us are real. Those technological challenges have been addressed by panels prior to us, and I am one to take a bit of a contest with the notion that we can't get the carbon capture and storage in a 40-year timeline. I believe that is quite an extended timeline. We hope that we don't get there.

Our company has joined in the belief that Chairman Boucher mentioned 2 weeks ago, and I hate to reflect back on a Budweiser commercial, but you said it all. If, in fact, this technology and the timelines that you set for us don't join together, then we will accomplish very little short of a nice, political sound bite.

The facts remain that we have to address this issue both in a pre-combustion and a post-combustion undertaking. At American Electric Power where we have led the industry in technological breakthroughs for over 100 years, we have announced two pre-combustion technologies. One, integrated gas combined cycle, which we would hope to build either in Ohio, West Virginia, or maybe Kentucky.

Second, ultra-super-critical coal technologies which we hope to deploy in Arkansas and Oklahoma. One of the other things that we are working on in a pre-combustion sense is an oxy-fueled undertaking with the Babcock and Wilcox Company, which we hope to put in place at our northeastern plant in Oologah, Oklahoma on a 450-megawatt sized facility for the ultimate taking of that resource for enhanced oil recovery opportunities. We believe that is very important.

On a post-combustion activity, we have every intent to go forward with our partner Olstrum by putting a demonstration and verification project at our mountaineer station in West Virginia at the 30-megawatt level and then ultimately moving that up to the 450-megawatt level to capture and utilize gas for underground storage in the West Virginia environment and, as I said, enhanced oil recovery out west.

We believe that these things can be done. Those are really not research but in fact are demonstration verification deployment technologies. The sooner we get about that business, the quicker we will have some answers to this challenge. On the research side for CO^2, we really should, as a country, embrace the notion of researching some multiple and beneficial use of CO^2 once it has been captured rather than simply storing. Our friends in Japan today have a heat pump that utilizes CO^2 as its fuel source.

Some years ago when we implemented the post-combustion technologies for SOx and NOx control, we had a byproduct that we used to put to landfills. Today I am proud to tell you that this industry, our company, and many of my colleagues, now provide that byproduct to the wallboard industry to make what we call in the Midwest drywall, which some of us call in the rest of the country wallboard. I believe that there is where we should put our research efforts rather than continuing to say that capture and storage is a science project. It doesn't need to be. Both pre- and post-combustion can be handled.

Last, let me mention a moment about the implementation. Both my colleagues Jim Rogers and David Sokol raised this issue for you, but as you go forward with a cap-and-trade program if, in fact, that is the way that we go, the allocation of the credits is substantially important to all of us who will be involved with the real challenge to get this work done. We would be strong proponents for taking the road map that you have used once before where 95 percent of the credits that were created by the enabling legislation were, in fact, allocated to those of us who were going to face the technological and financial challenge to get it done.

I firmly believe that if we go to a massive auction undertaking, it is simply a matter of economics for those who would buy the credits because they wouldn't buy them unless they intended to sell them at a profit. An allocation to non-emitting sources is exactly the same thing: a chance for profit taking rather than giving those credits to us who are trying to make a difference.

I thank you for your time, your attention. I look forward to your questions and answers.

[The prepared statement of Mr. Morris appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Morris.

Mr. MORRIS. You're welcome.

Mr. BOUCHER. Mr. Reasor, we will be happy to hear from you.

STATEMENT OF JACKSON E. REASOR, PRESIDENT AND CHIEF EXECUTIVE OFFICER, OLD DOMINION ELECTRIC COOPERATIVE, GLEN ALLEN, VA

Mr. REASOR. Good morning, Mr. Chairman and members of the subcommittee. My name is Jack Reasor, and as president and CEO

of Old Dominion Electric Cooperative, ODEC, headquartered just outside Richmond, Virginia, it is a pleasure to be here today and to share our views of this important topic of global climate change.

After listening to Mr. Morris, I must confess to you that the footprint of ODEC is rather small, but I can assure you that the 500,000-plus consumers that own us and depend upon us for their power supply are vitally interested in this question as well. ODEC has tried over the years to provide a diverse generation source for our members. We depend primarily on coal, but also have a small ownership interest in a nuclear plant, and we have also built gas and oil peaking units as well. And we find this mix very, very important for us.

We have also worked toward finding some renewables, and that has been very difficult for us. The availability of renewables in our area is very limited, but we have begun to work in this area. And we do generate or purchase from some renewable sources a small amount of energy today.

But we have also worked with our members over the past years. We have 12 distribution electric cooperatives throughout Virginia, Maryland, and Delaware that depend upon us for their power supply. In working with them through demand-side management programs, we have been able to reduce about 10 percent of our peak load through that opportunity.

But today we face a challenge because of the fact that our members are growing at a very rapid rate, not only population wise, but in their use of electricity. And we are in a position that we are already behind the curve in providing new and additional generation. We are required to purchase more and more of our energy needs on the open market. Majority of that through the PJM system is also coal generated as well, but we need to have more control over our own assets and over the assets of the generation that we provide our members.

ODEC is also part of a larger organization, the electric cooperatives all across the country. Electric cooperatives serve about 75 percent of the landmass of this country, and we serve about 12 percent of the consumers in the United States. But when you look at who we serve and where we are located, we are usually in very low-density areas of the country.

As an example, generally the typical electric cooperative in the United States has 7 customers per mile, 7. That compares to the investor-owned utilities at about 35 customers per mile, and municipal systems at about 47 customers per mile. We also find that on average our member consumers are at a lower income level. As a matter of fact, the average utility electric cooperative consumer's income is about 16 percent below the national income average.

And when you look at the electric cooperatives and the G&Ts, such as ODEC, who provide the power to these rural areas and to these consumer owners, you will find a couple of factors about us that are very important in this process.

One, because of the fact that we are consumer-owned and we return any excess funds back to the consumer, we have very low equity ratios. Second, due to the fact that we are consumer-owned, we do not have stockholders. Therefore we basically are always

debt financing. With low equity ratios, always debt financing, it puts us in a very difficult position.

And as I move to my first point, Mr. Chairman, and that is that technology is very important. I will not repeat a great deal of what has been said by my colleagues because I endorse what they are saying as well, that it is very important that the technology be developed to address the issues that we face today. I would caution you please do not let the legislation get ahead of the technology.

But as electric cooperatives, we find it very difficult for us to be the first to try new technologies. We want to support all the technologies that are available and that can be developed, and we are confident the answers will be found in that new technology. But electric cooperatives are not in a position to be on the frontline of developing those new technologies.

Second, as you move down this road of requirements and moving all of us toward a cleaner environment, which we want to be a part of as well, we would ask that as you provide certain incentives, and you will be required to provide those incentives, that you would also be sure that those incentives will also work for not-for-profit electric cooperatives as well. If you will do that, I can assure you that we will take advantage of those opportunities and also work toward the development of these new technologies.

And, Mr. Chairman, my final point would be if this committee moves in the direction of a cap-and-trade program, we would like to have the opportunity to work with the subcommittee in developing that program. And I would ask two particular points be considered in that process. One, we think under a cap-and-trade program that the allowances should be allocated and not auctioned. We think that is very important.

Second, we also feel that these allocations should be based on fuel input. It is very important that they go toward the source of where they are needed, and that generally will be fossil fuels. And I say that as president of a company who also has a small ownership interest in a nuclear facility, but I would ask that you would consider these proposals and think about them as you move toward this process.

Mr. Chairman, I appreciate the opportunity to be here, and we look forward to answering questions and also working with the subcommittee as you make your decisions.

[The prepared statement of Mr. Reasor appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Reasor. We are delighted to have you here this morning. Mr. Lee, we will be happy to hear from you.

STATEMENT OF MILTON B. LEE, GENERAL MANAGER AND CHIEF EXECUTIVE OFFICER, CPS ENERGY COMPANY, SAN ANTONIO, TX

Mr. LEE. Thank you, Mr. Chairman. Good morning and to the distinguished members of the subcommittee also. My name is Milton Lee, and I am general manager and CEO of CPS Energy in San Antonio, Texas. I appreciate the opportunity to address you today, and I hope my remarks will assist you in your deliberations.

CPS Energy is the Nation's largest municipally-owned energy company providing both natural gas and electric service. And as a municipal utility, CPS Energy belongs to a class of utilities termed public power utilities. Our owners are the citizens of our communities, and they expect their public power utilities to provide reliable, affordable power in an environmentally sensitive manner.

Public power utilities are governed either by elected public officials, such as city councils or by boards or appointed or elected officials. It is truly local governed, subject to open meetings and open records requirements that assures local issues are adequately addressed.

Public power makes no profit. Our prices are set not at what the market will bear but at the level sufficient to cover our costs and sustain a reasonable reserve for repairs and replacement of our capital equipment. CPS Energy recently began construction of a new coal-fired power plant near San Antonio, a plant that was subject to the most rigorous public involvement process ever. Many of the issues now being dealt with this committee were at issue during our public involvement process of our coal-fired power plant.

As a result, our engineers and consultants have given careful thought to these matters, and they have relied upon the most current information available in forming their opinions. The research conducted by CPS Energy over the past several years gives us an opportunity to express a few opinions regarding the current discussions of a greenhouse gas policy and how it relates to the utility sector.

Please permit me to summarize those opinions and recommendations now. First, given the extreme complexity and seriousness of the issues at hand, the committee should undertake its deliberations with all due consideration and without regard to artificially imposed or impractical deadlines or timelines. Improperly done, this legislation could adversely impact the economic health of the United States and yet have no positive impact on climate change. Proceed, but proceed with caution.

Global climate change policy and regulations should include all greenhouse gases. Greenhouse climate change should include all members of the global community also, and they should be expected to commit to a program of greenhouse gas emissions reductions. In the event other significant emitters fail to meet goals and objectives, legislation should provide a safety valve to protect against economic harm.

Any legislation must be applicable to all sectors of the economy, not just the electric utility industry itself. Current technology for carbon capture and sequestration for fossil fuel generation does not adequately support the effective implementation of a cap-and-trade program for CO^2 at this present time. Legislation should not limit our flexibility to rely on the most abundant domestic fuel source, coal.

Legislation should be based upon a phased approach to solving this problem. Congress should develop a reasonable timeline for these phases based upon the objectives of preserving economic growth, developing the technologies needed to accomplish these goals, and allowing time to deploy these technologies.

Public power and private utilities have different government structures that have lead to the discrepancies in the availability of certain Federal incentives. Whatever Federal incentives are utilized to promote private investment, all sectors should share in equal access.

Mr. Chairman, this concludes my prepared remarks. Thank you again for the opportunity to address this committee.

[The prepared statement of Mr. Lee appears at the conclusion of the hearing.]

Mr. BOUCHER. Thank you very much, Mr. Lee. And thanks to each of our witnesses for your very thoughtful testimony here this morning. I am going to recognize myself for a 5-minute round of questions, and I will begin by propounding to each of you the same question that we propounded to the chief executive officers of the automobile manufacturers when they were before the subcommittee last week. I would note that each of them answered this question in the affirmative. I will just note that, and we will look forward to your answers as well.

We are in the process of considering legislation that would be mandatory in nature, that would fashion a United States response to the challenge of climate change. It would have economy-wide application. It would not be something that controls only the electric utility sector but would apply to the entire economy. Our goal would be to prevent any sector of the economy from being dislocated and to prevent any disproportionate burden from falling on any sector of the economy as compared to the balance of the economy.

We would certainly preserve your ability to continue to use coal, and I have duly noted that comment in virtually all of your statements. It also would be a measure that would assure in some fashion that we have international participation from the developing world as we go forward with the mandatory program for the United States.

I should say that while we certainly are considering cap-and-trade as one approach to achieving this result, we have not made policy decisions about what mode we would have for establishing a mandatory program in this country. And so this question is not specific to cap-and-trade; although, that certainly is one major candidate for our consideration.

If we fashion legislation that has these components and these characteristics, will each of you work with the subcommittee in drafting the bill, in making sure that these goals are met, and in helping to fashion a United States response for the challenge that we are confronting? Mr. Sterba, let me begin with you.

Mr. STERBA. I will be brief. Yes. And we look forward to the opportunity.

Mr. BOUCHER. Thank you, Mr. Sterba. Mr. Rogers?

Mr. ROGERS. Jeff set a good example. My answer would be yes, and we look forward to the opportunity to work with you to make it happen.

Mr. BOUCHER. Thank you, Mr. Rogers. Mr. Sokol?

Mr. SOKOL. Yes, Mr. Chairman, we would be pleased to.

Mr. BOUCHER. Thank you, Mr. Sokol. Mr. Morris?

Mr. MORRIS. Yes, sir.

Mr. BOUCHER. Thank you, Mr. Morris. Mr. Reasor?

Mr. REASOR. Yes, sir, we look forward to it.

Mr. BOUCHER. Thank you, Mr. Reasor. Mr. Lee?

Mr. LEE. Yes, sir.

Mr. BOUCHER. That was just a great set of answers. I want to thank you for those responses.

One of the objectives that we have, as I think you have indicated in your statements and we have indicated here in ours is not in any way to disable the ability of coal-fired utilities to continue to use coal, to do so at current volumes and preserve the opportunity for coal's share of the electricity generation market to grow. I think it is noteworthy that EEI has suggested that under current trends, by the year 2030, coal's share of the market would grow from 51 percent today to 57 or 58 percent, and we would want to preserve that opportunity for coal to occupy that greater market share if it is your desire for that to happen. For that to happen, we will have to have technology available that in a carbon-constrained environment enables carbon capture and permanent storage. And so my question to you is what is the appropriate government role at this point to accelerate the availability of that technology? Should we provide financial incentives to electric utilities? Should we be providing research and development funding? I should say research, development, and demonstration funding in order to accelerate the arrival of that technology. And assuming that the answer to that question is yes, and more dollars are going to be required, can you give us a sense of the scope of what those expenditures should be, and is there a schedule that you have in mind for the expenditure of those funds? Mr. Sterba, would you like to comment?

Mr. STERBA. Yes, sir. There are a number of things that need to be done, and they are not all just associated with funding. Let me touch on those first, and then I will touch briefly on funding. One of the biggest challenges that we have is the era of uncertainty. We don't have certainty over what the licensing, siting, or liability requirements may be, particularly licensing and siting. Those still have to be defined, and it is very difficult to go forward on a commercial basis until they are.

And it is not just with respect to the storage facilities themselves. It is all of the pipeline and other infrastructure that will be necessary to move the material from where it is going to be coming from out of a coal-fired plant to where it is going to be located. That has got to be job one, and the difficulty is that frankly could be fraught with litigation and opposition, and so I would urge that that get moved on very quickly.

Relative to the RDDD, and it really is, as you rightfully pointed out, it is more on the DDD, development and deployment and demonstration than it is on the pure research side. Yes, there is additional funding that is necessary. I believe in the revised budget, there is $100 million being put forward in this proposed budget from the administration. That is probably off by a factor of five to six times in terms of what is necessary on both the capture and storage end of the game. And that is probably an average over the next 10 years. We cannot afford to be in a position that we can't by 2020, 2025, be able to implement capture and storage. But to do that, we have got to accelerate the pace of the demonstration

and development a number of large-scale projects, a million or more tons each, in different geologies across the country.

Mr. BOUCHER. Thank you, Mr. Sterba, for that very thorough answer. Would other witnesses care to comment on that question? Mr. Sokol.

Mr. SOKOL. Mr. Chairman, I think the other piece of this—and Jeff hit on a very important piece, but that is just the regulatory side needs to be emphasized. The MIT study that was referenced earlier in this discussion points out that if we are just to capture and store 60 percent of existing coal-fired CO^2 generation, we have to replicate one-third of the pipeline capacity of the existing natural gas system in America, just to move it. That has to be sited, the siting of transmission lines today for electricity are well known to all of you is the difficulty of doing that. Natural gas is a separate commodity than CO^2. Those types of issues have to be focused upon in these timelines for not only research, but also the development.

And second, if we are sincere about moving to a carbon severely constrained environment, we have got to spend more money on the nuclear side of this equation as well because coal has to play a major role. Nuclear will have to play a major role as well.

Mr. BOUCHER. Thank you very much, Mr. Sokol. Would anyone else care to comment? Mr. Lee.

Mr. LEE. Yes, Mr. Chairman, one other consideration could be that a user fee could be supplementing any Federal incentives that would come forward and which all coal users could participate in that process with the restriction though that that funding would be placed for a little "r" and big "D" for technology to move forward. And the latest that we have seen via EPRI, the Electrical Power Research Institute, is that they think technology could be available as soon as 2020 if appropriate funding was provided at this current time.

Mr. BOUCHER. I think the pace of the deployment really will depend on the pace of the funding between now and the time it is ready. Well, thank you very much. I appreciate those answers, and my time is expired. The gentleman from Illinois, Mr. Hastert, is recognized for 5 minutes.

Mr. HASTERT. Thank you, gentlemen. It's interesting if you will look on that map that was put up on the board. My State of Illinois only has about 45, 48 percent coal utility. I had the dubious honor of chairing a select committee to rewrite the Public Utility Act in 1983 and 1984. After Three Mile Island, we had 14 nuclear plants coming online at that time, and nuclear was supposed to be too cheap to meter. A $400 million nuclear plant ended up costing $5 billion. Of course, that was passed onto the ratepayers, as Mr. Barton noted, that those increasing costs do. So I made a rash prediction back then that probably we wouldn't cite another nuclear plant in this Nation for 20 years. Well, it has been 20 years, and it is time to review this and look at it. I think nuclear has to develop. We have to find the best and safest ways to develop nuclear.

In my district that has a huge nuclear use, there are 40 coal trains, 130 cars a piece, that move through my district every day to fire up and light up the greater metropolitan area of Chicago. I have to explain: 20 going and 20 leaving. But they are there. And

how do we make sure then that that coal utility can keep operating, can stay efficient and bring a fair cost to the consumer?

At the same time, we see, when I was here in 1992, and we looked to see how do we need to develop energy. And we decided that natural gas, there was such an abundance of natural gas in this country that it was an unlimited commodity. So every power plant that we build basically since 1992 has been a gas-fired or gas-peak plant. Well, we find out that all of a sudden, there is an end to natural gas and there is a cost to natural gas. And that too then has become suspect.

Here are the alternatives. You say you are going to sequester and cap. That is one technology. That is one idea. If we are going to gasify coal or liquidize coal, there is more energy under the city of Gillette, Wyoming than there is of all Saudi Arabia if it was used in an effective manner. How do you determine or how should we determine what are the best ways? Let us not just go down one road. Let us look at all the alternatives. Mr. Sterba, what is the best way in your opinion, just quickly?

Mr. STERBA. It is to use all of those sources. We cannot make the assumption that there is a single answer. It has got to be the entire portfolio, and every time we eliminate one for political or other reasons, our ability to accomplish the objective is impacted.

Mr. HASTERT. Mr. Rogers.

Mr. ROGERS. The portfolio approach to creating a generation fleet is really critical. In the period you talked about in the 1990s, there has been no time in our history of our country have we been so dependent on one fuel, where 90 percent of the generation was gas-fired. And that is the new generation.

That is really the answer. We need coal. From an energy security standpoint, we need to find a way to use it. We need nuclear, and we shouldn't be addressing this issue of climate without addressing in a straightforward way the nuclear issues. Today, 24 reactors are being built around the world, and not a single one is built in the United States today.

Mr. HASTERT. Mr. Sokol?

Mr. SOKOL. Yes, Congressman, I think you are hitting on a point that is very important, and that is that we need all of the above. This subcommittee and the Congress needs to deal with this issue, even the magnitude of the issue, in a holistic way. We have got to blend energy policy, environmental policy, and economic policy because in the past what we have done is focused on natural gas or nuclear in energy policy or coal. We then dealt with pieces of environmental policy, and we largely ignored the economic effects. This is a wholesale change. If global climate change is to be addressed in the way it is being discussed, a wholesale change in how we utilize and develop energy in this country, and that can't be done with any single technology. It has to be a holistic approach.

Mr. HASTERT. Mr. Morris.

Mr. MORRIS. One of the things that we can lose sight of, Mr. Hastert, is that all of these decisions are really State decisions. I think Tip O'Neill said it best. All utility rates are local. The fact remains that if I want to build an integrated gas plant in Ohio, which I do because I think that technology is important for precombustion capture and storage of carbon and global warming

gases, that is up to the public utility commission of Ohio, not to the Congress of the United States. And we all have to face that issue, so going to the portfolio, allowing those who want to build new nuclear are going forward, allowing those who want to build clean coal, either pre- or post-combustion go forward. But it is always a State's issue at the rate regulator in the States where we are still regulated, which still is the dominant regulatory process here in the country. So my colleagues are right. The portfolio is important, but this is a State's issue as to how we decide what plant will be built and how the costs incurred in building that plant are doled out to our customers in the charges that we have.

Mr. HASTERT. Well, sometimes I think maybe this committee may want to usurp or some committees may want to usurp State regulation. I don't have time to ask the rest of the gentlemen. I would really like to hear your comments later. Mr. Chairman, thank you for your indulgence.

Mr. BOUCHER. Thank you very much, Mr. Hastert. The gentleman from Michigan, Mr. Dingell, chairman of the full committee, is recognized for 5 minutes.

Mr. DINGELL. As chairman, you are most courteous. Thank you. Gentlemen, thank you for being at the committee today. It is a pleasure to see many old friends down there again, and I want you to know that I appreciate your testimony. You have given us some very good testimony. You have told us what you think should be done, but you have not told us who should be the one to do it. Mr. Rogers, what kind of regulatory agency or to whom should these matters be suggested?

Mr. ROGERS. Well I think first and foremost is I look back to the success that we have had with cap-and-trade and SO^2 that really grew out of 1990 Clean Air Act amendments. As I look forward, that kind of regulatory regime makes sense because it is both a push and pull to get it right in terms of the market price with respect to technologies as well——

Mr. DINGELL. But to whom do we assign this? This is going to be a fine mess. Who is going to be the lucky guy that gets it?

Mr. ROGERS. Well, I think at the end of the day, in terms of setting it, it is really with respect to the—I would say the EPA would be the one in terms of having the jurisdiction over this long term.

Mr. DINGELL. Gentlemen, I would appreciate it if each of you would submit for the record to whom you think this responsibility should be allocated for administration. Sir?

Mr. MORRIS. Chairman Dingell, if I might add a comment to Mr. Rogers' answer, I think it is important when we look back at the implementation of new source review and the on-again-off-again, never ending debate over what those words mean, I would hope that this committee, in its drafting of this legislation, would be somewhat prescriptive so that we don't leave a great deal open to debate. As I learned at the Detroit College of Law some years ago, words are extremely important, and they have very deep and broad meaning. So the more clarity that your committee can put into legislation, whichever form it takes, will help all of us in the end trying to accomplish these goals, which we all jointly believe in and clearly do support.

Mr. DINGELL. Now, I have heard the suggestion that we should have essentially a two-phase program. One is we should have an allocations allowance system for a certain period of time which should be phased out gradually in favor of an auction system. And, Mr. Rogers, I am going to stick you with this question again. How long should the allocation phase last, and who would make a decision as to when and how this system would be phased out in favor of the auction system?

Mr. ROGERS. Chairman Dingell, my judgment would be is that it would be three phases actually. I think there ought to be a 5-year waiting period, as we had with the Clean Air Act amendments of 1990 first. Second, we then go into the phase where we do the allocation of allowances, and allow that to be for a period that is—and this is an important point. It needs to be timed with the availability of the technology that actually allows us to remove the carbon. And that is an important part. Whether it is 10 years, 15 years, 20 years, to me, it needs to be tied to the availability of technology. That has to be the determining point. And then the auction period comes in after that period.

Mr. DINGELL. All right, now, Mr. Sterba, you urge that the U.S. account for the global dimension of climate change, and you suggest our leadership is essential and that the United States should not condition its own policies on equal actions by developing nations. How should the U.S. coordinate its domestic climate change actions with the participation in international negotiations? Each of these tasks is very difficult, and doing the two of them together will require enormous skill and care. How are we going to address that, and how will we do it?

Mr. STERBA. Mr. Dingell, my suggestion would be that the U.S. should formulate its policy and what it believes makes sense but in the context of the global environment, and that it should not just be a policy of we won't do it until you do it. But I very much endorse the proposal that has been put forward by Mr. Morris and by our friends at IBEW that says if you don't do it, there is a cost to the goods that are imported into our country because you have not taken on that responsibility as our country has. So I believe that our continued engagement needs to be relative to the engagement of the rest of the countries, particularly those developing countries. But I don't think we can say we won't do it until you do it.

Mr. DINGELL. You are saying we should have an enforcement mechanism?

Mr. STERBA. Absolutely.

Mr. DINGELL. Gentlemen, I look, and my time has expired. Mr. Chairman, I thank you for your courtesy. I would ask this, Mr. Chairman. I will have some questions that I would like to submit to the panel for the purposes of the record, and I would ask your courtesy in keeping the record open so that could be done. And, gentlemen, I would hope that when we send you a nice little letter that you would respond to us because we have some questions frankly on which we desperately need your assistance and advice. Thank you.

Mr. STERBA. Thank you for the opportunity.

Mr. BOUCHER. Thank you very much, Mr. Dingell. And without objection, the record of this hearing will remain open for the submission of questions by the members of the subcommittees to our witnesses. And we would ask for your expeditious response when they are received. The gentleman from Texas, Mr. Barton, the ranking member of the full committee, is recognized for 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman. And before I ask my questions, I think we should take time out to congratulate this panel and the industry that they represent. We have the most efficient, cleanest—with the exception of the French who are almost all nuclear-power generation and transmission system in the world. And it is in large measure thanks to the fact that we have allowed the decision making, as has been pointed out, to be done by the private sector in conjunction with our public utility commissions around the country. So I want to congratulate this group for making it possible to have the kind of economy and the industrial strength that we have in our Nation. I am sincere about that.

My first question is I assume everybody on the panel thinks we should continue to use coal and even use more of it. Everybody that thinks coal should be a part of our future energy mix, please raise your hand.

All right, I also, with the exception of maybe our public utility down from San Antonio, would assume that you all are all committed to trying to increase the use of nuclear power. If you do that, raise your hand.

I see even our San Antonio gentleman, OK.

Mr. SHIMKUS. Mr. Barton, would you make sure just for the record you will note that they all raised their hands?

Mr. BARTON. They have all so far.

Mr. SHIMKUS. I mean I see it, but for the record.

Mr. BARTON. I am learning from Mr. Boucher. I am trying to come up with questions that they all agree to. Now, it gets a little bit tougher. Mr. Lee, you announced that your utility, which is a municipal utility, has just begun construction or got approval to begin construction of a new coal-fired power plant. Is that correct?

Mr. LEE. That's correct. We got that permit from the Texas Commission of Environmental Quality about a year ago, and the unit has been under construction for about a year.

Mr. BARTON. OK, when it is in operation, can you tell us what the cost per kilowatt hour of its output is expected to be?

Mr. LEE. Approximately 5 to 6 cents a kilowatt hour.

Mr. BARTON. Five to 6 cents, OK. Now, Mr. Rogers, you are the new president of EEI, and you just announced to this group the support for some sort of a cap-and-trade system. But if I heard you correctly, you don't want that to be implemented for about 20 years. Is that right?

Mr. ROGERS. No, I didn't say it that way. First of all, Mr. Barton, Tom Kuhn is president. I am just chairman of the board.

Mr. BARTON. Just chairman of the board. I apologize.

Mr. ROGERS. For a short period.

Mr. BARTON. Yes, I have a feeling he does what you and the board tell him to do, but I may be wrong. But no, I know Tom well, and he is——

Mr. ROGERS. We do a good job of listening to Tom.

Mr. BARTON. Right.

Mr. ROGERS. I think the way we look at it is that to implement cap-and-trade, which is not the position of EEI, but which is our company's position, and to do that appropriately, based on past precedent, you need a 5-year waiting period. And then you need a period where cap-and-trade goes into place because you start to work to get the most cost-effective offsets. But during that period you have allocations which are really critical to making the transition.

Mr. BARTON. But when in your scenario do you expect there to really be a cost that has to be incurred by the ratepayer or the stockholder or the taxpayer for this system? What is your first year that there is a real cost that kicks in?

Mr. ROGERS. It is 5 years after enactment, which is the waiting period.

Mr. BARTON. OK. Well, here is my problem. When I hear Mr. Boucher ask these questions and he gets everybody to say yes, the only thing that you are not agreeing to is a chicken in every pot and a mule in every barn. I mean he phrases it so everybody says yes, but we really don't talk about when it is going to happen and what is it going to cost when it does happen.

My understanding is that our economy is growing each year, and a demand for electricity is somewhere in increase between 2 and 3 percent a year. That is about one 500-megawatt power plant every week. Every week. What are we going to do next year? Are we going to build these new coal plants? And if you are going to build a coal plant, what kind of a technology are you going to use next year?

I am fine for some system 50 years from now, but I am not fine with a system that kicks in next year if it means that everybody in America is going to pay 16.5 to 20 cents a kilowatt hour like I am paying down in Texas right now. That is my problem. What do we do next year and next year and next year while we are getting to this nirvana of zero cost carbon capture and sequestration while our economy is still growing 2 to 3 percent a year? What do you do next year?

Mr. ROGERS. Mr. Barton, the reason for the waiting period, in my judgment, is to get prepared and start to, during that period, get credit for early action so you start to bank credits. You start to take action. You start to look for offsets. You start to plan for future generation. You look at replacing old coal plants with new coal plants that are more efficient. You take at least 10 years to build nuclear. You look at that. You look at renewables or investment in renewables. You look at energy efficiency because all of a sudden once you start to price carbon, you begin to get a clear picture of what the value of energy efficiency initiatives would be. So I think you do all these things going forward.

Mr. BARTON. Well, my time has expired, but I think we kind of got the nub of the problem. There is nothing we can do next year to build these new generation plants that is cost-free. That is the issue that at some point in time we have got to address in a serious way if we don't want to wreck our economy. With that, Mr. Chairman, I yield back.

Mr. BOUCHER. Thank you very much, Mr. Barton. The gentleman from Pennsylvania, Mr. Doyle, is recognized for 5 minutes.

Mr. DOYLE. Thank you, Mr. Chairman. I want to thank the panelists for your very thoughtful testimony, and if we are going to get this done, we do have to work together. And, Mr. Barton, I think we all recognize this isn't something that is going to happen next year, and it isn't going to be without cost.

I had a guy come in my office about 10 years ago, and he said to me Mike, remember two things. He says coal can never be clean, and nuclear can never be safe. There are probably still a lot of people that believe that today. I am certainly not one of them. I think that we understand that if we are going to address our energy needs of the future, one of the things we can't do is put all our eggs in one basket. When we put all our eggs in a natural gas basket and those prices went up, we all saw the ramifications of that.

We have invested hundreds of millions of dollars in developing these next-generation nuclear power plants. The AP1000, Westinghouse, General Electric. We sell it everywhere but our own country. Everywhere but our own country. We fight every year on the House floor with Members of Congress who want to cut the R&D funding for clean coal technology programs.

I noted in Mr. Sokol's testimony that the Federal budget for research and development has decreased 85 percent since 1980. We are not putting our money where our mouth is either. If these are national priorities, if this is important for the future—if this is like when President Kennedy said let us put a man on the moon when nobody knew how to do that, but he doubled the NASA budget for the next 2, 3, 4 years until it got done, I think it is going to take the same kind of commitment on behalf of Congress to not just say this is a problem and not just say this is a challenge for the country, but to start to invest in the research and development and to provide the incentives in partnership with the private sector so that we can start moving down this path.

Mr. Morris, I read your editorial with Mr. Hill. I think it is right on the money. We cannot consider climate change debate without considering our trade policy too. If this is just going to be about emission migration to countries that aren't participating, we are going to de-industrialize our country. And coming from western Pennsylvania, from Pittsburgh, I am not going to be party to that either.

Mr. MORRIS. With no environmental benefit whatsoever worldwide.

Mr. DOYLE. Exactly. We are just shifting the emissions. We are not eliminating them.

Mr. MORRIS. Absolutely.

Mr. DOYLE. So that has to be part of the debate too. But one thing is for certain. If the United States doesn't start doing something, nobody else is going to do anything either. So not doing anything isn't an option either. We have to start to take steps to address this problem. But then we have to make sure that others are taking steps to work with us because if they are not willing to do this—and that is where I think this situation comes in with the trade or with some sort of a safety valve, if you want to call it that, with any type of mandatory program that we put on our industries

here in the United States that we will take some steps in that direction too. But if the world doesn't follow, then there is going to have to be some leveling of the playing field for those countries who don't participate in the form of disincentivizing technologies and companies to simply shift their resources over to these countries that don't participate.

I just want to ask all of you in the minute and a half that I have left what you think we can be doing? Because this is going to be a partnership. We have done darn little, in my opinion, in terms of the investment we have made to this. What can we do? What current programs we are doing now or what new programs or what regulation-wise can we be doing to give you guys the biggest bang for your buck to address some of the concerns that Mr. Barton has? How do we start to bring some of these technologies, some of these strategies to deployment sooner rather than later? What can we do to help you do that? And just go right down from the beginning.

Mr. STERBA. Let me start with three, Mr. Doyle. Number 1, appropriately and adequately fund the research, development, and demonstration endeavors that need to be undertaken at the Federal level. Number 2, resolve the nuclear spent fuel issue so that we can make nuclear a viable component in the future. And No. 3, ensure that the administration either has legislation or has the ability to develop the necessary siting and licensing and liability aspects from an administrative perspective associated with carbon storage.

Mr. DOYLE. Thank you.

Mr. ROGERS. My comment would be that everybody likes to talk about the devil being in the detail. I think God is in the details, and this committee needs to embrace the details. And the details are the funding, as Jeff talked about, RDDD. It is solving the nuclear spent fuel issue. It is encouraging States to really step up on energy efficiency and renewables, and it is also really about, during this waiting period, getting credit for early action. The most important point I can leave with you is if this problem is as it has been defined, and I believe it is, we need to go to work now. And waiting 5 years, 10 years, 15 years, 20 years is not a good answer because the lowest cost solution for our customers and for our country will be action now, not delay.

Mr. SOKOL. Merge the Department of Environmental Protection into the Department of Energy and require them to deal with these issues on a combined basis.

Mr. MORRIS. Interesting. To your comment earlier on, coal can be clean and nuclear can, in fact, be safe, but it will not be cheaper. And we can't continue to believe that that is part of the answer because it just isn't. We do need 24/7 base load power plants. We do not need any more peaking coal or peaking gas. An 18, 19 trillion foot supply, 22 trillion foot demand just gets worse if we head in that direction, so we need to do those things.

What our company intends to do in 2008, we will have a 30-megawatt capture and storage project on our mountaineer station in New Haven, West Virginia. By 2011, we will have a 450-megawatt capture enhanced oil recovery project at our northeastern station in Oklahoma. It is time to quit talking, and it is time to begin acting. And American Electric Power intends to do that.

To the extent that DOE will help fund that, that is important to my customers because ultimately, as I said to Mr. Hastert, the public utility commission in the State of Oklahoma will tell PSO what they can and cannot do. And the public utility commission in the State of West Virginia and Virginia will tell Appalachian Power what they can and cannot do in a financial sense.

So again all of the things that we are talking about today are going to end up with an incredible timeline if the States aren't equally encouraged to follow through and allow us to put that capital to work to demonstrate that this does work.

We keep talking about coal 50 percent of the capacity growing to 58 or 59 percent. That is capacity. That is not actual gigawatt hours production. It is much, much higher on gigawatt hours production because when you look at the overall capacity, renewables and other things fall in there. When you look at the actual gigawatt hours of produced energy for the economies of this country, there is a huge difference there. So this is a very important point. We cannot leave coal off of the agenda. We cannot leave our existing nuclear feet and the new potential nuclear plants not to come into play.

Mr. REASOR. Mr. Doyle, three things quickly. One, the diversity of the types of fuels that are involved, and we do need all of those. And that is what the other gentlemen have said, and I agree with that absolutely.

Second, the Department of Energy has had some excellent programs over the years in clean coal technology. That is not the only program, but the funding for those types of programs must be increased. And the private sector is prepared to step up and put money into those programs as well, but they need to be funded in a greater level from the Federal perspective. And then last, is to provide incentives. The electric cooperatives, while we might be small, if you take all of the electric cooperative generation across the country, that is 43,000 megawatts. That is a lot of generation. It would make us one of the large utilities in the country. We are prepared to do our part in helping new development, but we do need incentives, and we do need programs that will apply to not-for-profit cooperatives.

Mr. DOYLE. Mr. Lee.

Mr. LEE. And I will just finish by saying municipals are very similar to what Mr. Reasor just said on the cooperative side. We are not big into R&D, but we certainly are willing to work with you and this committee to move forward to do it. And I am certainly willing to give Jack a rate of return on his investment for the kind of investment that he is talking about doing in R&D.

Mr. DOYLE. Excellent. Mr. Chairman, thank you so much.

Mr. BOUCHER. Thank you very much, Mr. Doyle. The gentleman from Michigan, Mr. Upton, is recognized for 8 minutes.

Mr. UPTON. Thank you, Mr. Chairman, and I certainly appreciate the testimony of all of you, and to follow Mr. Barton, Mr. Boucher, maybe just a quick show of hands, are all of you in support of more nuclear power? That is very good. I am not going to yield back. I am sorry, Mr. Shimkus. I think in the response to Mr. Hastert, one of you indicated that we have got 24 new nuclear plants on the books to be built around the world, and not one of them—not one—

is in the United States. And Mr. Doyle made the very good point that Westinghouse and others, GE, have been very involved in new technology to make these even more efficient. Obviously continue the safety record that we have. But in that response to Mr. Hastert, Mr. Morris made the point that perhaps we need to look at overriding State regulatory bodies to try and get these in place in more States. And I would like you to expand on that and get comments from the other members of the panel as well.

Mr. MORRIS. Mr. Hastert took that to overriding the State authority, Congressman Upton. I would not make such a suggestion because I am still regulated in all 11 jurisdictions by those State public utility committees for public service.

Mr. UPTON. But if we did it, you wouldn't be opposed to that?

Mr. MORRIS. No, sir, if, in fact, we were able to shorten that timeline in the process. If you look at the certificate of operation and licensing, or COL, now at the NRC, it is a very, very productive, much more time respectful, and still very much a public endeavor as it goes forward.

Mr. UPTON. And we did that in the 2005 Act as I recall.

Mr. MORRIS. We did do that in the 2005 Act. To Mr. Rogers' point, however, though I am not sure we will see a new nuclear station, a shovel in the ground, until 2018 or 2019 here because clearly the first COL that is actually issued and the first utility that clearly intends to go forward will have to have in-State financial regulatory approval to do that. If I wanted to expand the DC Cook Plant in Michigan, I would have to petition the Michigan Public Service Commission for the authority to do that before I put my capital to work.

I don't suggest that Congress ought to overrule that or override that. Maybe enabling legislation that encourages a timeline shortening so we can do that. But all of that will also be challenged legally, and so we have to be realistic about what is in front of us. One of the critical things that we need to do in this process is something that the chair has said over, and that is to make certain the existing nuclear fleet doesn't get impacted. The existing coal fleet has a fighting chance to continue to participate in the generation of gigawatt hours, which are significant on a national basis.

Mr. UPTON. Other members wish to comment?

Mr. SOKOL. I would just make the comment that one of the single biggest issues with nuclear is the deposition of the final product, if you will, the spent fuel. United States Government took money from our customers and committed over 20 years ago to resolve that issue. Today it is still not resolved. I would ask you, would you allow us to get away with that? To take money for something and then not do it? And second, until we resolve it, you are not going to see new nuclear because the financial risk that every State regulatory body looks at is what is going to happen there. And with the unknown—and that is just part of this bigger issue. I have got environmental groups opposing hydroelectric facilities that are operating today, opposing renewable resources when they are in their backyard, against new nuclear, and absolutely dead set against coal.

Mr. UPTON. And even wind. In the case of Massachusetts, even wind.

Mr. SOKOL. If it is in your backyard. And we are one of the largest renewable companies in the country, and the reality is we solve this long-term pending problem called global climate change by working together in a portfolio fashion that has to include each of these technologies.

Mr. MORRIS. There is one more issue that we might want to think about when we talk about renewables, Congressman Upton, and I think that David just really brought it to light. We too are very large players in the renewable industry, particularly in the western Texas environment where wind blows 24/7. Unfortunately, no one lives in western Texas, so there is about a billion dollar transmission network that needs to be built to bring that wind from its point of origin to the actual load pocket where it might be used in central or eastern Texas.

We still have a huge disjoint at the Federal State level on the permitting, the regulatory approval, and the cost recovery of the transmission build out. And I know in the 2005 Act, we addressed the issue of backup Federal eminent domain authority, and we may need to cede the FERC with more authority to see to it that legislation allows for the transmission to be built. It will, at the end of the day, be both an environmental bill and an economic bill. So it falls right into the work that this subcommittee is taking on.

Mr. UPTON. Mr. Morris, you talked a little bit about a couple of different technological breakthroughs that you are embarking on. I notice Michigan wasn't among the States. Illinois was not among the States either, and I know for Michigan, jobs is a very big issue. In fact, we have the highest unemployment rate in the Nation, and we are above the national average in terms of the coal share of total generation based on this chart at 58 percent, the national average being 50 or 51. What were the costs to AEP for these new facilities that you are building?

Mr. MORRIS. It looks as though the 30-megawatt endeavor at the mountaineer station will be something between $50 and $100 million. And again that is a 30-megawatt demonstration verification of the Olstrum chilled ammonia technology as being a viable technology to capture carbon. We are blessed at that station that we have an underground storage complex that is more than capable of handling the carbon storage.

Mr. UPTON. How deep does it go?

Mr. MORRIS. I am sorry. That is beyond my pay rate. I don't exactly know what the depth of it is, but we have done all of the geologic testing of that formation to feel comfortable about that.

Mr. UPTON. And what is the reduction in CO^2?

Mr. MORRIS. Well, you will be capturing in excess of 90 percent of the CO^2 out of the flue gas stream because that is really a post-combustion technology that we intend to use. In Oklahoma, our intent, at a 450-megawatt station, which is going to be considerably more expensive, is to capture the carbon there and put it into productive use in enhanced oil recovery. In some of the well played out fields in Oklahoma, we think that is the real plus for the energy process in the country, as well as for our customers in the State of Oklahoma. That might absorb a great deal of the cost of the actual carbon technology capture, but at our Northeastern section, we still need to, because of the implementation of the care rules, we

will now need to invest in the FGDs and the SERS for SOx, NOx in mercury, which we intend to do.

Mr. UPTON. Mr. Rogers, in your combined role at EEI, do you all support the safety valve, make sure that other countries have to play as well?

Mr. ROGERS. I think the safety valve is really critical in two ways. One is it guarantees that we don't have an adverse impact on our economy, but also really allows us to get as much carbon reduction as we can at that price. So I think the safety valve is important. I also think a broader sort of provision with respect to reset is important. It could be tied to other developing countries stepping into the program. It could also be tied to the prospect of what if technology, for instance carbon capture and storage, doesn't evolve as we plan the timeline on the cap. I think it is very important to sync up, match up the reduction and our perception of when the technology will be available to allow us to actually remove carbon from our plants.

Mr. UPTON. And as my time expires, I just want to comment on Mr. Sterba's comment on more energy efficient light bulbs. It has been something that I have been looking at for a while now. I am looking forward to working with the chairman, Mr. Hastert, Mrs. Harman, on developing legislation so we can really make some advances forward. And I look forward to seeing that accomplishment this year. Thank you.

Mr. BOUCHER. Thank you very much, Mr. Upton. The gentleman from Texas, Mr. Gonzalez, is recognized for 5 minutes.

Mr. GONZALEZ. Thank you very much, Mr. Chairman. One thing these hearings have been able to establish, and it should have been the obvious, is that we have coal. We are going to continue to depend on coal, and for anyone to go away from these hearings with some sort of an illusion that we are going to replace coal in the near future is just plain wrong.

So the question then goes to how do we make it cleaner and such, and still expand on the other sources, such as nuclear, which we have problems there too with disposing of the waste and so on, the licensing. The information that is provided us here today is that U.S. power generation by energy source, coal nearly 50 percent United States. And I don't know how that compares in previous years if we fast-forward.

I also cited from a "Post" article that in the next 5 years we are probably going to have 40 more coal-fired plants in the making, established, completed, and by 2030, 150. Mr. Sokol, I think you have your plant coming on, and, Mr. Lee, you all have made a determination that you are going with coal. The question then comes to why did you not utilize the latest technology in the way of what, I guess, is referred to as gasification, Mr. Sokol?

Mr. SOKOL. That is a great question, Congressman. One brief moment just to remind everyone what it is we do because all of us here are essentially co-ops. There are regulated, profitable co-ops, and there are municipal and rural electric co-ops. We present to the regulator the options of fulfilling the State and Federal mandates that we have, which is to provide energy at the lowest cost available to the cooperative members, our customers.

We are not a free market. Our customers don't get to buy a different SUV or a hybrid automobile. They buy power from us if they live in our region. And the State regulatory bodies direct us as to how we make decisions on the next round of technology. In our case, in 2000, we sat down with the Democratic governor of Iowa, the Republican and Democratic leaders of the House and the Senate, the consumer advocate groups, the major consumers, environmental groups, as well as the regulatory body, and said Iowa needs to make some decisions for the long haul.

Over a 6-month period, a decision was made to increase renewables to about 12 percent of the overall portfolio, which we have now already done, add a new natural gas-fired facility of the modern technology, which was 550 megawatts, which is already added. And thirdly, add for our system's benefit, 500 megawatts of super-critical coal which is this plant just online today, operating at super-critical technology, just came online beginning in January. It is an 800-megwatt plant of which we own 500 megawatts, and we have allowed the rural electric co-ops and municipal agencies in our State to buy the other 300 megawatts and own that of that facility.

That decision was made by our State regulatory body along with us and along with all those municipal agencies on the basis that IGCC technology with sequestration is not a proven technology, nor one that the economics can be reasonably estimated at this time. We have gone out for bids of the major suppliers. We have not been able to get a fixed price bid from any of the major suppliers of IGCC technology, nor any meaningful guarantees as to their performance. It is a technology in development, and based on that, the regulatory bodies wouldn't allow us to go forward. But they did go forward with the energy efficiency, renewables, gas, and coal decision.

Mr. GONZALEZ. Mr. Lee?

Mr. LEE. Let me follow up on that, Congressman. What we did is we made a thorough review of all the various technologies, and just like been mentioned before, we didn't see that the IGCC technology was ready for prime time. So what we decided to do was say until it is ready for prime time, and Mr. Morris already stated that they will be looking at a demonstration project of 30 megawatts, we decided to go with proven technology.

But the difference for what we did was to ensure that the emissions systems on our publicized coal plant would be some of the lowest emission levels in the country. So if you take SOx, NOx, particular, and mercury and put them together and take a look at the emissions level, if this plant really doesn't meet the limits that we have in our permit, the systems or subsystems for those emission levels, we basically would have to shut down the plant.

So there is little to no flexibility in the emission levels, and from studies that we have done in looking at IGCC, we believe that the emissions level today on this plant when it comes online in 2010 will either meet or beat those that are being proposed by IGCC.

Mr. GONZALEZ. Thank you very much. I yield back.

Mr. MORRIS. If I could just take 1 minute to make sure the record reflects accurately, my good friend, Mr. Lee, made a mistake. On our 30-megawatt facility is a post-combustion capture

demonstration. Now, an integrated gas combined cycle plans are for plants that will be 630 megawatts, which is considerably different.

Mr. LEE. My correction. Thank you, Mr. Morris.

Mr. MORRIS. You're welcome, Milton.

Mr. GONZALEZ. Thank you.

Mr. BOUCHER. Thank you, Mr. Gonzalez. The gentleman from Illinois, Mr. Shimkus, is recognized for 5 minutes.

Mr. SHIMKUS. Thank you, Mr. Chairman. I think this has been a great hearing, and I appreciate the comments. I had one of your colleagues, to be nameless, said we are in discussions because we would rather be shot in the arm than shot in the head. And I know some of you folks are here at the table out of that concern. So I am the skeptic at the table, and I think you need skeptics to continue to raise these issues so that this can be fully debated. Be careful of what, in your negotiations, the Federal Government promises you that it will do.

Yucca Mountain is a perfect example of our inability to deliver. So as we negotiate, and the chairman of this committee knows that I have great respect for him, and I think he is an honest and fair broker. But I can't say that for how we deliver. Here in Washington, we continue to overpromise and underdeliver across the board.

I don't know one example—maybe the landing on the moon, but there is a difference in this debate. Landing on the moon was Government funds, Government science. It wasn't private capital. Unless we want to take over the electricity generation business as a Federal responsibility, then correlating this to NASA and the moonwalk is, I think, a worthless exercise because you have to raise capital. You have to assume risks. I think that is what we just talked about with the research plant in why are you deploying what you are deploying? Here is my skepticism. Tell me how—and we fought this battle in this committee and this Congress now for years. How would alleviating the problems of new source review help in this debate? And you can be brief. It is a pretty simple question. Mr. Sterba?

Mr. STERBA. It is the uncertainty of the language of NSR that creates interpretation capabilities about what may be imposed if you take certain actions. Specifically, there are many coal plants that exist in the United States today that could be upgraded through what is called a dense pack process. It is basically a reblading of the turbine with using new materials and new fitting such that you would be able to get more megawatts out of the same amount of energy that you put in.

Mr. SHIMKUS. Thanks. Let me stop there for a second because I know my friend from Washington State is here, and he always talks about this company with new compression technology, and that would help us in this whole debate. Now, if this new compression technology was available to assist in power and electricity generation plants, could you deploy it without extremely additional cost?

Mr. STERBA. We could deploy it without significant additional cost, but we may be faced with the risk of much higher costs, depending on the interpretation of NSR. If it triggers an NSR then

I may be exposing my customers to a set of costs that are way beyond what I can justify.

Mr. SHIMKUS. So if I could summarize. If we tried to bring some certainty to the new source review process, which would allow you to get more efficiencies, higher electricity generation, having the same emission ratio as you do now, that would be a positive public policy change in this debate. And you, Mr. Sterba, and I will do the same thing. Would that be a positive approach to trying to address some of these concerns?

Mr. STERBA. Yes.

Mr. SHIMKUS. For the record, I will note that every panelist raised their hands saying that if we successfully address new source review. And, Mr. Chairman, I am a skeptic, but I would submit that if you would have that as part of your legislative package, you might be able to start convincing me to be less of a skeptic as we move forward because the problem is those of us who have worked on new source review for years, it gets blocked every year by the environmental community in this town when it has all benefits, zero disadvantages to this whole debate. Not just on carbon, but NOx, SOx, particular matter, and mercury. So I would ask you to join me in that cause. Mr. Chairman, I will end and yield back.

Mr. BOUCHER. Thank you very much, Mr. Shimkus. The chair appreciates that line of questioning. I am pleased now to recognize the gentleman from Washington State, Mr. Inslee, for 8 minutes.

Mr. INSLEE. Thank you. How many of you believe it is appropriate for the United States to adopt some cap-and-trade system for CO^2? Great. It is a start.

Mr. SHIMKUS. For the record, only two raised their hands, Mr. Inslee.

Mr. INSLEE. Time will tell. That will change, Mr. Shimkus. Bear with me.

Mr. MORRIS. Only because it had no definition other than a cap-and-trade program, which is clearly unvotable.

Mr. INSLEE. How many agree with Mr. Sterba's testimony that, just as the space race spawned today's information technology age, the clean energy race has the potential to launch the U.S. as a world leader and exporter of carbon-free technology? Raise your hand if you agree with that. OK, we have five. We have unanimity in that, Mr. Shimkus. We had a start. I think that is one of the most important things I have heard today, and the reason is that I believe that our response to this challenge is the greatest economic opportunity the United States has had to expand our economy since the invention of the Internet for sure.

I was having breakfast with a longshoreman this morning talking about the fact that the ships come in from China low in the water, and when they go back, they are empty, and they are high in the water. We need to start putting our technology on the ships back to China, and what I want to see is this Congress to develop a policy so that we give an incentive to American economy to develop the technologies to sell to China to clean coal technology they are going to have to have. And they know they are going to have to have it because you can't see the flag of China in Tiananmen Square because it is too foggy right now. And I believe it is our destiny to sell that technology to them.

Now, Mr. Shimkus made reference to this one compression technology. I hope you get to know the Ramgen Company. It is a little company in Tacoma, Washington that has developed a compression technology using sonic wave technology that can reduce the cost of compressing CO^2 30 to 40 percent and generating heat that you can use in the gasification process at less cost. And that is the kind of thing that I hope to incentivize.

And I want to tell you I have seen a great epiphany here today in one thing. There is a lot of good reasons to have this hearing, but one of them is a great epiphany by my friends on the Republican side of the aisle because for years we tried to ask them to help us deal with spiraling energy costs when Enron was running rampant charging 1,000 percent increases in the West. Turned out the stoplights in California. We couldn't get them to raise a finger to help us. Now, I hope they will help us to develop a meaningful cap-and-trade system.

I want to ask you gentlemen about the relationship between your use of coal and the potential coal-to-liquids fuel issue. Some advocate the United States should adopt a policy that will vastly expand a coal-to-liquids technology to use liquid fuel in our gas tanks. Now, I am concerned about that because my understanding of that technology is that it does not reduce CO^2 emissions in the lifecycle of the technology. You might save some CO^2 in the processing, but when you burn the liquid, you end up putting just almost as much, probably 94 percent, at least as much CO^2 in the air as you do a gallon of gasoline.

So I want to ask you this. If we have two alternatives. If we have $100 for R&D for coal, and scenario A is to take that $100 and put it into clean coal technology to find out how to sequester CO^2 in your industry in the production of electricity. Or we have scenario B where we only have $50 available for you, and we take $50 and we give it to the coal-to-liquification R&D, which one of those scenarios should the country adopt? Whoever wants to go first.

Mr. SOKOL. Congressman, if you have $100, I would keep it.

Mr. INSLEE. Right.

Mr. SOKOL. But let me try to put it—I am not an expert in the liquid side of it. That is not our field. I am familiar with gasification-to-liquids because it is often raised when we look at a gasifier for coal to make electricity. But our sector, it is estimated—and I think these numbers are not aggressive. They are actually probably understated. We need $5 billion of our DDD dollars federally to actually make a meaningful impact in the technology development that we need as an energy sector, and that is for electricity-type involvement, whether it is the removal of CO^2 out of gas streams, whether it is sequestration, or whether it is new technologies, nuclear and others. So $5 billion a year for 10 years to kind of get the level of technology capability that we could then export into China, et cetera.

The important thing to recognize there is we don't develop technology. No one here sitting on this panel develops technology. We utilize it. What Mr. Morris is doing at AEP is terrific, and we are actually friends with them on a number of different undertakings. But they are using Olstrum technology. We are using other peoples' technology. Those folks can only develop it if there is a market for

it and if there is cooperation with Government on some of these changes.

And that is a really critical element is we are not a free market enterprise, as I said before. We are a cooperative, and so I think that is just an important piece.

Mr. INSLEE. Mr. Morris.

Mr. MORRIS. I will try to comment on that issue that you raised, Congressman. I think when you talk to coal-to-liquids, you are talking about an energy independence issue, not necessarily an environmental plus issue. And Governor Manchin and Governor Strickland in the State of West Virginia and Ohio and our company are beginning to look at that much more aggressively in West Virginia. But that is really an energy independence as to a transportation fuel. That does have potential. There is no question about that, and we should continue to look at that. When you are talking about coal to gas to electricity, you are talking about an environmental benefit of the concept of capturing all of the gases, whether they are pollutants in a traditional sense or this global warming gases in a non-traditional sense. And I can support that we understand those two differences. As to your first point——

Mr. INSLEE. I want to make sure I let Mr. Rogers—could I get to Mr. Rogers' point just for a minute? Thank you.

Mr. MORRIS. Sure.

Mr. INSLEE. Thank you.

Mr. ROGERS. Congressman, I would make the observation I would put all my money into the electricity side of this for a real clear reason. You have to have a vision in terms of where we are going. Today, 50 percent of our electricity comes from coal, and we are going to build additional plants in the future.

The second point is if you want to have energy security and a vision, the right vision for the auto industry is really the idea of plug-in hybrids, and we see that on the horizon as the answer. So if I was picking between coal-to-liquids and plug-in hybrids, I would pick plug-in hybrids because I think it is near term and more likely. And it allows us at the same time to really put the money where it really needs to be with respect to the backbone of our economy, and that is our electric grid.

Mr. STERBA. Mr. Inslee, I would make one other caveat to that, and that is that the most important piece is on the storage side. Because whether we use it out of the carbon that is coming from coal-fired gas generation or the liquifaction for the use of fuels, in both instances, you have got the storage question. And then I would second what Mr. Rogers said about plug-in hybrids.

Mr. INSLEE. Mr. Sterba, one of the questions my friends on the other side asked is what do we possibly do right now while we are waiting for this technology to develop, and I was impressed in your testimony about your evaluation of the New Mexico efficiency market where, I guess, you said that you could meet 40 percent of your new system growth at half the cost of conventional generation. Is that accurate, and how do you do that?

Mr. STERBA. Yes, and there are a number of different elements to that program, but what we have to do in order to effect is we have got to change the business model so that energy efficiency is, in fact, a business so we are incented to do as much energy effi-

ciency as we would be for building new power plants. But it is lighting. It is HVAC. It is all of the fundamental aspects that go into how customers use energy, and you can't do it by just changing your behavior. You have to do it by leveraging technology.

Mr. INSLEE. And that is decoupling?

Mr. STERBA. Decoupling is certainly one of the tools. It is not the only one, but it is one of the tools.

Mr. INSLEE. Thank you, gentlemen.

Mr. BOUCHER. Thank you very much, Mr. Inslee. The gentleman from Oregon, Mr. Walden, is recognized for 8 minutes.

Mr. WALDEN. Thank you, Mr. Chairman. I want to thank our panelists who are here today. We have appreciated hearing your thoughts on this issue that is so important in America and I think across the globe today. I would ask a general question. The former chairman asked about how many new power plants are going to have to be built to keep up with demand, and I wonder if you each could tell me, from your perspective, how many new plants at what megawatt output do you anticipate need to be built in the United States from whatever generating source to keep pace with demand, Mr. Sterba?

Mr. STERBA. Well, yes, sir, it represents about a 40 percent increase, and if my memory serves me, there is about 300,000, 320,000 megawatts within the United States today. So we are talking about somewhere around 150,000. The part that probably bothers me a little bit is something that I am not sure we have adequately taken into account. There is an estimate by CERA, Cambridge Energy Research, that says that there is another 150,000 megawatts of generation that will be required if, in fact, we have a 1½ to 2 degree increase in temperature by 2050.

Mr. WALDEN. All right.

Mr. STERBA. So that is another piece that frankly we have not taken into account in a lot of our planning.

Mr. WALDEN. All right, anybody else want to comment or add to that? Then I guess the next question I would ask is what is the cost to consumers for some sort of CO^2 capping and trading system? Can any of you identify for me today what your estimates would be? Mr. Sokol?

Mr. SOKOL. Congressman, let me try to estimate it because it depends on what it is you do. One of the reasons we are not in favor of a cap-and-trade system anywhere in the near future is merely because it will effectively merely in the electric sector be a tax on our consumers. Because since we don't have the alternatives available to us then whatever you charge us will get passed through to our customers. The SO^2 system worked well once we had the technologies available so that an economic decision could be made that this is what it cost to do that. We spent over $1 billion in our company on SO^2 NOx and mercury removal just in the last 10 years because those price signals were clear and the technology existed.

If I am charged $30 a ton which translates basically through to a doubling of generation costs for coal-fired generation, the customer is going to pay that because we don't——

Mr. WALDEN. But can anybody quantify what you think that will be? Mr. Morris, you talked about——

Mr. SOKOL. But our system would be doubling of their generational electric rates.

Mr. WALDEN. Doubling of their rates in the Pacific—well, my part of the world the Pacific course system. Mr. Morris, you indicated this would be a job loss bill of some sort in your comments. Can you comment on this aspect of it?

Mr. MORRIS. What I suggest was if we go about this in a wrong-headed fashion without making certain that the rest of the world joined us in one way, shape, or form, we could end up seeing a huge export of industrial manufacturing jobs. Our company serving the middle part of the country still has a tremendous manufacturing base in our customer account.

To your question of the cost, it is unknown but not unknowable. And that is why we are trying to get some projects up and running, a, to verify that the technology works, b, to have a real understanding of the impact of those technologies.

One of the biggest challenges with the greenhouse gas capture is the amount of parasitic impact it has on the megawatt hours available from a power plant. The chilled ammonia approach appears to be in the 10 or 12 plus percent range, which is to say if you had a 1,000-megawatt plant today, you'll have an 880-megawatt plant. That is a negative impact that we need to work on, but until we get those projects up and running, we won't know the answers to those questions.

To David's point, there is no question it will be more expensive. No question it will be more expensive.

Mr. WALDEN. Do you think it will double the rates?

Mr. MORRIS. I don't know if it is that high because I just don't know what that will cost. I know this: that just like MidAmerican, we have spent over $4 billion on SOx, NOx, and mercury control. And because we have been able to change our fuel mix, higher sulfur coals, our overall cost production has actually stayed very level. I don't know if that will be the case with more carbon capture.

Mr. ROGERS. Congressman, may I make an observation?

Mr. WALDEN. Yes, sure, quick.

Mr. ROGERS. We need to be careful here not to over or underestimate the impact of the future, and let me tell you why because it goes back to the God is in the details point.

Mr. WALDEN. Right.

Mr. ROGERS. And that is if we do the cap right, if we phase it in consistent with the technology that we project to be available, if we really invest in energy efficiency—and we have had chronic underinvestment in energy efficiency in this country—if we invest in renewables, there is a series of things that we can do over a period of time that will allow us to do this without having adverse impact on our economy.

Mr. WALDEN. I hope you are right, and I get that. And I realize that the devil is in the details. What I am trying to figure out is ratepayers in my region, what it will cost them if it isn't done correctly. And I will tell you, as much as I am a skier. I love snow in the mountains. I don't want the globe to adversely warm if we can prevent that if that is a good thing. But I have real trouble in going down this path when I know that India and China are going to put 450 coal burning plants online over the next few years. We

already get their pollution in the Northwest. Whether there is a dust storm in the Gobi Desert to the noxious emissions out of their various industrial plants blow right over the Pacific and pollute our atmosphere. And I don't see why we ought to upend our economy if we don't have some sort of worldwide agreement on this because China and India will put more carbon into the atmosphere than the Kyoto Accords were designed to remove in the first place. Do any of you disagree with that?

Mr. MORRIS. No, sir.

Mr. WALDEN. Raise your hands if you disagree. Thank you. For the record, nobody raised their hand. Well, you don't. Well, then let me take it the other way. Do you think we ought to have a cap-and-trade system, the United States, on anything related to carbon that doesn't include other countries around the world? Should we go it alone?

Mr. MORRIS. We should not. We can start it alone, but it has to have either one of two safety valves that I spoke to in my comment, either a tariff aspect on those products that would be imported without control in the home country, or as the European Union did, set a standard, have a timeline. If no one joins us, lower the standard, extend the timeline, have less of an impact on the economy, one of those two options.

Mr. WALDEN. Let me ask a different question, and that is about renewable portfolio standards. Do all of you agree that energy producing sources that don't add to SOx, NOx, or CO^2 in a measurable degree should be included in any renewable portfolio standard, either mandatory or voluntary? Should an energy source that doesn't produce that be included and counted. We are doing the raise the hand thing, I guess, today. Now, I come from the Northwest. It is no secret to you all we are predominantly hydro, and yet in most renewable energy portfolio standards hydro is dismissed as if it doesn't exist as a renewable energy source.

Mr. STERBA. Well, I think what we have seen, and of course, I come from New Mexico, and the one thing we would like is your water because we don't have any. But I think in most of the renewable portfolio standards, we see new hydro being included, just not existing hydro.

Mr. WALDEN. Well, yes, but I guess the point and a concern I have with cap-and-trade is those of us who are fortunate enough to live where we do that have power in our regions that don't produce noxious gases or CO^2, I don't want us to get penalized for being good players when these systems are set up. I don't think that is right or fair. So with that, my time is expired. Thank you, Mr. Chairman. I thank the panelists.

Mr. BOUCHER. Thank you very much, Mr. Walden. The gentleman from Massachusetts, Mr. Markey, is recognized for 8 minutes.

Mr. MARKEY. Thank you, Mr. Chairman. Mr. Morris, in your testimony, you argue for having the Federal Government allocate greenhouse gas emission allowances to your company and other owners of coal plants based on historic emissions allowing "only a small number of the allowances, less than 5 percent to be auctioned or set aside for public benefit purposes." Now, according to the National Commission on Energy Policy, this is what they say. Because

they do not bear the cost, allocating most allowances for free to energy producers creates the potential for large windfall profits. Why should utilities receive what amounts to a huge Government grant that can be worth many, many times the cost of compliance?

Mr. MORRIS. Because they will actually incur the cost to implement the technology that would allow us to capture and store the carbon. Those who would advocate for allowance to them who incur no cost simply are in it for the money. We are in it to make a difference, Congressman.

Mr. MARKEY. Well, as you know, many have criticized the European Union for allocating too many pollution credits to industry during the period between 2005 and 2007. A recent study on how the German government allocated credits reports that German utilities were set to make windfall profits of between 31 and 64 billion Euros until the end of 2012. If we follow your formula and allocate 95 percent of the credits to your company and other utility and non-utility generators of carbon and other emissions, I think we are just going to be handing over a similar windfall.

Mr. MORRIS. Well, I would think that the mistakes that were made by the Germans in the European Union don't need to be repeated by us. We should learn by others' mistakes, not repeat them. The fact of the matter is that we allocated in the SOx and NOx and mercury process, those credits went to the very people who invested hundreds of millions. In our company, $5 billion in the last 3 years on SOx, NOx, and mercury control. Those are real costs that were incurred. The credits go to the benefit of our customers while we are implementing those undertakings. There is no windfall profit in the regulated utility model. In the 11 States we serve, we are rate regulated in all but the State of Texas, except for our energy delivery piece.

Mr. MARKEY. Well, let me turn to Mr. Rogers. Let me ask you a question, Mr. Rogers, and it is in the same subject area. In your testimony, I see that you seem to disagree somewhat with Mr. Morris's call for 95 percent of allowances to be allocated to utility and other generators for free, instead calling for allocations during a transition period, and then gradually phasing them out in favor of a full auction. What percentage, Mr. Rogers, of these allowances would you want to initially have allocated for free? What percentage would you have auctioned off? And how quickly would you phase out the free allocations and move to a full auction system?

Mr. ROGERS. Now, you are putting me in the position to be king of the world, and I love that. If I was king of the world, I would start out with 100 percent allocated to those who are going to incur a disproportionate burden of this, and it is primarily consumers who rely primarily on coal. And that is why we presented the map to show the 25 States where more than 50 percent of electricity comes from coal. And then I would phase it out over time, and I would look to what we did with SO^2.

Mr. MARKEY. What period of time would you suggest?

Mr. ROGERS. I would tie it to when we see technologies coming online to allow us to capture carbon and store carbon or remove carbon from the stream. It is critical that we get the reduction.

Mr. MARKEY. Who would select that? Should we select a timeframe, or would you allow it to the industry to select the timeframe?

Mr. ROGERS. I think that you all should be prescriptive with this, but leave a provision that says if the technologies are not online as expected, we take a look at what the cap should be and how the allocations are done. I think it is critical that we keep in mind this idea of reset because there is a lot of things that we don't know today but we may know better later.

Mr. MARKEY. But you would move to a full auction eventually?

Mr. ROGERS. Eventually. Yes, sir.

Mr. MARKEY. OK.

Mr. ROGERS. OK, may I make one point just quickly?

Mr. MARKEY. Yes please.

Mr. ROGERS. There is a fundamental difference about what happened in Europe and what would happen in the United States. In Europe, they allocated the allowances to companies who did not reduce their rates. They actually charged them for the CO^2 and didn't give the benefit to the customers. In the U.S. in every regulated jurisdiction, and certainly in all of ours, you would pass those zero allowances through to the customers, and the customers would get the benefit, not the companies or the investors in the company.

Mr. MARKEY. OK. Now, how about if there is an unregulated area? Would we mandate that there be a pass through?

Mr. ROGERS. In the unregulated areas, it is primarily left to the market.

Mr. MARKEY. No, should we mandate it in other words. You are saying that the regulated automatically pass on. Should we mandate a national mandate on the unregulated?

Mr. ROGERS. I think it is difficult to do that in a competitive market. Is it possible? Yes.

Mr. MARKEY. So now we have your loophole, OK, so that is the problem. It would be an unregulated market. So if you can't force that it be passed on, then it is just a windfall profit.

Mr. STERBA. Mr. Markey, I would encourage that you do that.

Mr. MARKEY. OK, thank you. I appreciate that, sir. I appreciate it. Thank you. Mr. Morris, why shouldn't we allocate all of these greenhouse credits to auction them off, and use the resulting revenues for public benefit, such as accelerated R&D on new technologies, energy efficiency, or even reducing taxes for business or individual consumers that might be faced with higher energy prices? Why not use market mechanisms like an auction to efficiently price these credits rather than have politicians allocate most of the credits?

Mr. MORRIS. Well, again, I think that because we have tried the allocation system and it works so well in SOx, NOx, and mercury, we should simply repeat that success and not try to do something that may or may not be beneficial. At the end of the day, if you do auction, I would argue that is exactly where the money should go. But, as our Congressman from Illinois said, money into the Federal coffers never seems to come back, and that is a very real world that we all live in. If you have an auction, the person who buys at auction is going to sell at a profit creating your very wind-

fall profits that you spoke to. And they are not going to spend the money to make a difference, and that is what this is about.

Mr. MARKEY. All right, Mr. Sokol, on page two of your testimony, you asked us the subcommittee "to impose this new system in a way that does not proportionately burden any sector of the economy or consumers in any region of the country and one is that we should not try to pick winners and losers." If we are going to be allocating to the utility industry a potentially huge windfall profit in the form of free allowances, why doesn't that result in picking winners and losers? Why shouldn't we use market mechanisms, auctions, to the maximum extent possible to efficiently price these allowances?

Mr. SOKOL. Thank you, Congressman. I don't think you should allocate a windfall to the utility industry. We don't want it. We would specifically oppose it because in the methodology you are talking about, that is the reason we are opposed to cap-and-trade at this point. The market can't deal with this issue because the technology to solve the problem isn't there.

Congressman Shimkus made the point that President Kennedy and the analogy to the space program isn't direct. It is direct. President Kennedy was honest with the American people in that he said, I am going to take your tax dollars, and through NASA, we are going to put a man on the moon, and we are going to bring him back safely. And there will be benefits from that. Be as honest with the American people. Tax the American people to remove CO^2 from our atmosphere, and tax the American people. And then you use those dollars to create the technologies to do it. That is all we are asking. We are not opposed to solving this problem. We have to have the technologies available to us to do it. Cap-and-trade doesn't bring them to us. It makes, perhaps, financiers wealthy, it may make marketers wealthy, but it will not solve the problem of reducing CO^2 technology well, and so that is where the dollars need to be applied. We don't want them as windfall. We would reject them.

Mr. MARKEY. I look forward to the day where Congressman Shimkus sounds like President Kennedy and says I want to tax the American people. I look forward to that day, and it is a day in the future that will probably be as likely to arrive as——

Mr. BOUCHER. Thank you, Mr. Markey.

Mr. MARKEY. Thank you.

Mr. BOUCHER. The gentleman from Texas, Mr. Burgess, is recognized for 5 minutes.

Mr. BURGESS. Thank you, Mr. Chairman. Mr. Lee, back home in Texas, of course, San Antonio, you represent a municipal power company. In Denton, Texas, we similarly have a municipal power company that serves the citizens there, primarily natural gas derived and a lignite coal plant from which they derive their power. And as a consequence, when the natural gas prices went high, as you pointed out, you service a good number of citizens who are low income. The city of Denton has a good number of low-income citizens, and they were really hit hard with that. As someone pointed out, I heard from a lot of them. They were concerned about their bills. So with that in mind and the CO^2 cap-and-trade system that we have already heard about will raise prices by, I think the tech-

nical assessment was a lot. Well, what do you think that we are going to do about this?

Mr. LEE. I think it is a whole bunch. What we have done in San Antonio is roughly 20 percent of our population is at or below the poverty level, and if you assume poverty on an annual basis, for a family of four, is around $22,000 a year, you can see it doesn't go very far. What we have been able to do is to offer low-income consumers in our area some options to be able to help and assist them in paying their bills on the gas side and on the electric side both. In other words, we are actually contributing to funds within San Antonio, added revenues from CPS Energy that we get the city of San Antonio to administer for us. And we have made a commitment to them saying that that would continue to be available to them along with a lot of other Federal programs also.

Mr. BURGESS. So if there is a cap-and-trade system enacted, there will have to be some mechanism to protect the lower-income ratepayer as part of that?

Mr. LEE. Yes, sir. And we would still make a proposal to continue to assist them with the current processes we have in San Antonio.

Mr. BURGESS. Very good. Mr. Sokol, in light of your statement and your testimony that every dollar spent on reducing greenhouse gas emissions and avoiding potential impact of future climate change is one less dollar that can be invested in education or disease eradication or even other environmental programs that directly protect human health, we must weigh the risk and benefits carefully and spend our resources prudently. So with that in mind, how do you feel that Congress should focus on the issue of climate change and obviously, to some degree, the exclusion of other activities.

Mr. SOKOL. Thank you, Congressman. We agree with the comments that have been made by various people of a slow, stop, and reduce process. We are not, by any means, opposed or wanting to stick our head in the sand about is this an issue for the world to deal with. But we do have to make these tradeoffs. People have to pay real dollars for these decisions. As we have said, we have reduced our carbon intensity since 2000, 9 percent fleetwide. And we are a relatively large company, not as big as some here. And those are from voluntary decisions that we have made since we have obviously recognized that the world cares about this issue. And it is important. This is an important distinction. Nobody at this table built power plants 20 years ago to try to avoid a CO^2 issue. We didn't know it was an issue. We all breathe it, exhale it. We didn't know it was an issue. So we think we need a three-phased approach, spend time to reduce where we can, get to a point, we think, by 2030 perhaps to get back to where we were in 1990 levels and stop the growth, and then have the technology available to us through that process to start making serious reductions in the future. That type of glide slope, our estimation is, is affordable. It is going to cost money. It is not free. We think that glide slope costs about a 50 percent increase in electricity cost in this country above the CPI. That is a significant price to pay, but one we can probably afford. If we try to shorten those timeframes without available

technology, it can be multiples of that—and that is really our concern—are we then putting dollars to the best use.

Mr. BURGESS. And thank you for that very thoughtful answer. Mr. Rogers, in the limited time I have left, you provided us with a very colorful map, and you referenced the fact that politics might be involved in this process. I just wondered had you done a calculation of the electoral votes of the red and blue States versus the green States? Just wondering.

Mr. ROGERS. That is actually a great question because I really do believe the politics of this issue is driven not so much whether you are a Republican or a Democrat. They are really driven by what part of the country you are from and what resource you rely on. What that map does is illustrate that 25 States have more than 50 percent of their electricity from coal, and it is critical to their standard of living and their economy. And so as we make these decisions, I want to make sure everybody in those States understands the implications of this on their States because it is pretty easy for people to say it will have a minimal impact across the country. But the reality is it is going to have a dramatic impact on some regions much more than others.

Mr. BURGESS. Thank you, Mr. Chairman. I will yield back.

Mr. MATHESON [presiding]. Well, thank you. And now the Chair will recognize himself for 8 minutes. First of all, I want to thank the panel. You are up almost 3 hours now being here, and I think this has been one of the more substantive discussions we have had of the different climate change hearings for this subcommittee. And I think that your written testimony provides a lot of detailed suggestions and ideas, and I just want to compliment all of you because I think it is what this committee wants.

I want to make two quick comments, then ask some questions. First of all, Mr. Morris, you mentioned in response to a discussion with Mr. Upton the need for additional clarification beyond the 2005 Energy Act in siting of high-voltage transmission lines. And I encourage you to continue to advocate for that, and I think the subcommittee needs to take a look at that issue because I do think that there is still a level of uncertainty in the marketplace that creates a disincentive to invest in that infrastructure. And I think that is another energy issue this country needs to address.

Mr. MORRIS. It truly is, and it is an environmental issue as well.

Mr. MATHESON. Absolutely, so I appreciate that. Second, I want to thank Mr. Shimkus for his discussion on the new source review issue and the panelists' discussion on that. I do think that is something that would be helpful for us to be talking about more and trying to make some incremental progress. I fear sometimes in pursuit of the perfect, we are not willing to take some incremental steps that make a lot more sense. And we ought to be doing that, and I look forward to working with you on that as well.

Mr. Sokol, in your testimony, you mentioned the Epree study that had just come out recently, and you mentioned that you felt that it had some good recommendations in terms of how to move forward. You also included a draft outline of legislation with your testimony. The Epree study just came out recently, so is your draft outline pretty consistent with the Epree study? Do you want to

take a look back at revising that with the Epree material having come out, or do you feel that is pretty consistent with that?

Mr. SOKOL. I think it is pretty consistent. There are some details, both from the Epree study and frankly the recent MIT study that we think might bring some additional thought to a couple segments. But I think on balance, it is pretty consistent with both.

Mr. MATHESON. And you mentioned a target amount for R&D of around $5 billion annually. Do you have a suggestion of how that ought to be deployed? Are there certain technologies we ought to be looking at? Or do you have guidance for the committee on how you would suggest that be spent?

Mr. SOKOL. Well, yes, in the sense that it should be—I am talking about only of generation of electricity.

Mr. MATHESON. Understood.

Mr. SOKOL. It needs to be across a number of fronts. Frankly, transmission being one. Coal gasification, the storage and transportation of sequestered CO^2, nuclear, and frankly renewables in various categories, and the key element, I think, is in addition to the level of funding, and much of it would follow the Epree model that they have laid out. We think they have done an excellent job of identifying the areas, but also timeliness, put performance-based R&D dollars out there for industry to respond to rather than it getting gummed up in frankly Government bureaucracy. If we really want to move with due haste, we have got to have these technologies.

Mr. MATHESON. That may be something that would be helpful to have additional input from the panelists is that I think everybody up here at one level likes the notion of investment in basic research and development. It often becomes a dollar discussion, but there is a process discussion that ought to be had as well about how we go about implementing that. So I appreciate that.

Mr. Rogers, you mentioned that it would be helpful if we could remove some regulatory roadblocks, and you mentioned especially for energy efficiency. Can you talk about what some of those roadblocks might be?

Mr. ROGERS. Sure. It is very important that on the State level there is almost a renaissance of rethinking. What used to be called demand-side management really focused on energy efficiency, and the important point here is that today, at the State level, in virtually almost all States, we are not compensated in the same way to produce a save-a-watt or we reduce energy compared to a megawatt. And I think it is going to be critical that we are allowed to invest and create save-a-watts and earn off that at the State level, have the same incentives to do it as we have incentives today to meet the new demand with megawatts. And getting that right on the State level is going to lead to significant more investment in energy efficiency and fill the gap of chronic underinvestment that we have seen in this country over the last 20 to 30 years.

Mr. MATHESON. Do you think Congress has a role in making that happen?

Mr. ROGERS. I think Congress can encourage it. I think it still has to be done at the State level, but I think there is a series of things in terms of tax policy and other things that can be done to encourage that to happen. Another important aspect of this is I

know we consider renewable portfolio standards. In the 22 States who have adopted them, three of the States actually count the creation of save-a-watts or energy efficiency as part of their goal on renewables. That concept is a very important concept to move forward because not all parts of our country have the ability to invest in renewables like wind. We certainly can in South Carolina and North Carolina like you could if you were in the upper Midwest or in west Texas. But being able to focus on energy efficiency is really critical.

Mr. MATHESON. That just triggered one other question I did want to ask. We haven't had a lot of discussion today about thoughts on setting mandates for renewable energy portfolios. There is a need for flexibility in my mind because different States and different geographical areas have different opportunities. If that issue is going to be addressed in Federal legislation, how could we incorporate that flexibility into the mix?

Mr. ROGERS. I think one approach would simply be to recognize that a lot of progress has been made. Twenty-two States have passed it. Nine are considering it. We really need to kind of get to the goal line where every State has a renewable portfolio standard, and I think it is not unreasonable for Congress to contemplate setting a timeline for States to adopt, but leave it to the States to adopt what makes the most sense in that State.

Mr. MATHESON. All right.

Mr. SOKOL. Congressman, and two comments there. One would be also allowing States that maybe don't access to renewable energy as plentifully as others to, if you will, buy down their requirement by energy efficiency or even new nuclear. And you raise a very important point that I would strongly urge is as you formulate legislation, the National Association of Regulatory Utility Commissioners needs to be an important player in your thoughts because what you legislate, they have to implement. And I think while you shouldn't necessarily, in all cases, direct them, their input as to how some of these things are done so that they can, in fact, implement policy that works, I think can be enormously helpful.

Mr. MATHESON. I think that is a good suggestion.

Mr. STERBA. Mr. Chairman, if I could.

Mr. MATHESON. Sure.

Mr. STERBA. One other quick thing that is, I think, very essential is we have to think about renewables as a market, and the worst thing that happens is when we have States that say well, it is only renewable if it is located in my State because we disadvantage the most economic resources as opposed to helping ensure that they can move on the basis of where the lowest costs are.

Mr. MATHESON. That is helpful. Mr. Sterba, in your comments, you mentioned that in the short term, we ought to go after some of the low-hanging fruit as you described with efficiency being one of the obvious ones that is in front of us. What is the Federal role for trying to help pursue that? Do you have suggestions on what we ought to be doing from the Federal perspective to help make that happen?

Mr. STERBA. I think there is a couple of things, Mr. Chairman. The first is we had the conversation about new source review.

Mr. MATHESON. Right.

Mr. STERBA. And there are things that can be done to improve the efficiency of existing facilities that need to be facilitated. So that is one. The second one is on the end-use energy efficiency, one is we need to really take a hard look and see if we can reinvigorate the standards setting process for efficiency standards for appliances. We have just gone through it with transformers, and I think the industry stood up tall and said we want to drive efficiency in transformers to their highest levels. And then the third one is the encouragement of States to change the regulatory business model such that utilities who are looked at as the energy experts can be effective in helping move energy efficiency into the home and into the business.

Mr. MATHESON. OK, thanks. I have used up all of my time. I would like to recognize Mr. Buyer for 8 minutes.

Mr. BUYER. I will switch with Mr. Shadegg if that is OK with the Chair.

Mr. MATHESON. The Chair will recognize Mr. Shadegg for 5 minutes.

Mr. SHADEGG. I am going to begin by yielding to Mr. Shimkus.

Mr. SHIMKUS. Thank you. Just for clarification, there was a debate on coal-to-liquid technologies and plug-in hybrid. Coal-to-liquid is only a technology—you guys are in the electricity generation—for diesel fuel and aviation fuel. So it really has no bearing on gasoline. So that the debate about plug-ins for the vehicles is not—that is why DOD is very excited about this application. I know my chairman would agree with that.

Mr. SHADEGG. Thank you very much, Mr. Chairman, for yielding. I want to compliment this panel. I think it has been a superb panel. There is obviously an immense amount of thought that has been given to this topic. I would also like to thank Mr. Buyer for yielding.

I want to urge the panel, in addition to complementing them, to think through thoughtfully the major thrust of Mr. Shimkus's points, that is that this town overpromises and underdelivers, his discussion of the problems with Yucca. And I am going to illustrate some of those other problems that also the comments of the ranking member of the full committee, Mr. Barton, in terms of how difficult this is.

It is easy to talk about solutions and create the impression that we are going to fix this thing very quickly, but there are no answers that fit for tomorrow. New source review, I appreciate the comments of Mr. Shimkus on new source review. I want to crystallize this. I would like each of you to raise your hand if you agree that the current new source review law is keeping the industry from achieving efficiencies which would, in fact, reduce greenhouse gases. Is that correct? Everybody agrees with that.

Second, in both the 2003 bill and the 2005 bill, I inserted language which would have expedited the process for transmission siting. Everybody viewed that as evil. It didn't pass at all in the 2003 bill. It was softened dramatically in the 2005 bill. By softened, I meant actually toughened. We made the regulatory process worse rather than easier as I had tried in the 2005 bill. Let me ask the same question. Does everybody in this panel agree that if we

could expedite transmission siting, we would enhance our ability to use alternative fuels? Yes, everybody agrees with that.

Because Mr. Markey's questions go to a point I want to make. I take it everybody on this panel believes that the reason to allocate any credits, if we go to cap-and-trade—and I will tell you I have grave reservations about cap-and-trade. The reason to allocate them to current producers is because they are the ones having the burden, and because the goal isn't to create some third market out here that people can profiteer off of. The goal is to put the money into cleaning up the industry and reducing emissions. Does everybody agree with that?

Mr. MORRIS. Yes, in order to make a difference, not to make a profit.

Mr. SHADEGG. And everybody raised their hand. Everybody agreed. I want to make a point about renewable fuels. I believe 5 years ago and maybe longer than that, 8 years ago, in this committee, I brought in the hydrologic chart. I brought it in from, I think, a third or a fourth-grade text to show the committee that in point of face, the first renewable is hydro. And it showed water evaporating out of the ocean into the clouds, coming over the land mass, falling on the ground, and then going downhill. I did that because we were debating a bill, which had encouraging renewables in it and hydrology or hydrological power was not present at all. Do any of you know—and it seems to me it is the ultimate, certainly was the original, renewable.

There was some testimony here earlier that new hydro is in some of the States' renewable portfolios. Nobody here claims that it is in all of the States' renewables, do they? Let me ask how many of your companies are doing research on enhanced efficiency for hydrologic? That is it is my understanding that with today's technology, you can, instead of building a dam and putting a turbine on it, which creates a lake and causes all kinds of environmental problems, you can actually put a turbine in an in-stream flow. And that is have it produce electricity just by the movement of the water downhill without disturbing the environment by creating a dam. Are any of you looking into some of that technology? Mr. Sokol, you are? Could you explain briefly?

Mr. SOKOL. Well, we have actually built one just as you said, and we have a number of low-head hydros that could possibly be replaced with a similar type of technology. It works in some scenarios well. It is basically a run of the river structure so it can work in some areas well. It is not applicable for others.

Mr. SHADEGG. Right, I would encourage you all to take a look at that. We talked a little bit about nuclear, and in the time left, I want to talk about that. Do each of you believe—and if you do, please raise your hand—that any plan to control carbon dioxide or to control greenhouse gases must include legislation that removes the current regulatory obstacles for nuclear power? Does everybody agree with that? Will you help push for that? The chairman of the committee asked if you would help push for legislation. Will you help push for that as well?

Mr. SOKOL. Yes, sir.

Mr. SHADEGG. Let me ask you just to then each of you answer this question as my final question. Do you believe the administra-

tion's current Yucca Mountain legislative proposal goes far enough to remove those obstacles against new nuclear, or do you believe Congress needs to go beyond what is in the administration's proposal? Mr. Sterba?

Mr. STERBA. I don't believe it goes far enough. I think we need to both recognize the interim situation that we have got where we will not be able to get Yucca Mountain up, and we need to resolve the long term. So we have got to do both.

Mr. SHADEGG. To the extent that it goes beyond that, will you submit information to my office suggesting what else needs to be done?

Mr. STERBA. To the best extent of our ability, yes.

Mr. SHADEGG. Thanks.

Mr. BOUCHER [presiding]. Thank you, Mr. Shadegg.

Mr. SHADEGG. I think I asked each of them quickly.

Mr. BOUCHER. Very quickly.

Mr. ROGERS. I agree with Jeff, and I will submit the information to you.

Mr. SHADEGG. Thank you.

Mr. SOKOL. I think it needs to go further.

Mr. MORRIS. Same.

Mr. REASOR. Same here.

Mr. LEE. Same here, and we will submit some comments.

Mr. SHADEGG. Thank you all very much, and thank you, Mr. Chairman.

Mr. BOUCHER. Thank you very much, Mr. Shadegg. The gentleman from Indiana, Mr. Buyer, is recognized for 8 minutes.

Mr. BUYER. Thank you. Earlier there was a comment, and I think it came from one of the members of the subcommittee that utilities or companies are responsible for 40 percent of the greenhouse gases, and that number is bantering about. So I just want to hear from all of you whether or not——

Mr. MORRIS. Thirty-two.

Mr. BUYER. Thank you. And where do you get your number?

Mr. MORRIS. From the generation statistics that are kept by the Federal Government.

Mr. STERBA. And the number I have seen is 37, and I don't know if it is different years of measure or what.

Mr. BUYER. OK, Mr. Rogers.

Mr. ROGERS. Sir, I don't see it as——

Mr. BUYER. You have a number too?

Mr. ROGERS. One-third, 33.

Mr. SOKOL. I think the bulk of the numbers, if you plot them, run around 32 to 33 percent.

Mr. BUYER. OK, that is interesting. I am glad we clarified that.

Mr. MORRIS. We clarified that 40 isn't right.

Mr. STERBA. Which year do you want?

Mr. BUYER. Well, you know what? Eight percent is a big number though when you think about that. I think there is a reality that is in front of us, and that is a desire to rebalance our portfolio with regard to our sources of energy. And I think that is given. That is on the table.

I also recognize that what happens here in Washington has a tremendous impact upon the marketplace because how it reacts to

whatever policies we put in place coupled with the State regulatory regimes. So, Mr. Rogers, you had put up this map of the United States earlier, and as I looked at it, I mean I looked at that saying well, it tells a lot of history. That's the way I look at this map, Mr. Rogers, and say this is a country that got away from nuclear power and didn't use natural gas and build the infrastructure perhaps like it should have.

But at the same time, we had regulatory policies, that doesn't permit access to that natural gas. So you can't drill off the West, can't drill off the East, you can't drill here, you can't drill on BLM land. But I tell you what. We will go ahead and we will drill an Alaskan pipeline and bring it down. So here in Washington in the environmental policies, we end up here in this town making this a mess. And you are then trying to provide power to a country.

Now, all of a sudden, these same individuals, OK, who sort of let that go in place—the reason I say those same individuals, I came here in 1992 in the minority. Then when I came to the majority, those same forces here in this town that are an extreme environmental policy still prevented a Republican controlled Congress to even make changes in the rebalancing of our portfolio.

Those forces are alive, well, and excited. So excited, we get to listen to an Academy award winner tomorrow, Al Gore. I just can't wait to hear from his sound public policies. So what we have now to do is we are going to rebalance it, what, by using a regulatory regime? I don't know. I am frightened. I just want you to know I am a little frightened for you. Mr. Rogers?

Mr. ROGERS. I go back to what job one is for us. Our job is to keep the lights on. Our job is, when you throw the switch, electricity is there. That is what our mission is. Now, the problem in the past is we sometimes have gotten confused because we made environmental policy, not recognizing the impact on the energy policy and vice versa.

It is very important that when we make policy in the energy area or the environmental area we know of how those work together. And I think that is really critical to what you all are doing now with these hearings is seeing the interplay between energy policy and environmental policy.

My other point about that map is that map is not only about history in terms of how we got here. But also it is a little bit about the future because if you look at those States and who has relied on coal, it is going to be the same States that are going to build the coal plants for the future because that is where the coal is. That is where it is abundant and available and easy to get to your plants. Like Indiana. I mean of all the States on there, Indiana has got the greatest dependency. Only two other States have a greater dependency on coal.

So I think it is very important we get this right. We get the cap-and-trade right. We understand the interplay between energy and environmental policy, and the most important point, Congressman, I would leave with you is that we in this country, given the growth and demand for electricity at 40 percent by 2030, we cannot afford to take anything out of the equation. We cannot take nuclear out. We can't take gas out, renewables or energy efficiency. We need them all, and we need a lot of all of them in order to do this.

Mr. BUYER. Yes, but, Mr. Rogers, we can't say well, we want this fuel switching to occur. At the same time, we are not going to permit drilling.

Mr. ROGERS. I totally agree with that. In the 1990s, we had a policy in this country to build gas, and it was built in our environmental laws. It was built in a lot of different ways, and it was incentive to build gas. At the same time, we weren't allowing for the exploration in drilling to have the supply of gas. And that is why today we are sitting here saying how many LNG terminals can we build to meet the demand, and the fastest growing demand for gas is in power generation.

And unless we come up with a way to incent the building of coal plants and nuclear plants, we will build more gas, and we will find that our grid is dependent on foreign sources, not local sources. And that raises an energy security question that is pretty dramatic for this country in light of our dependence on oil and where that is taking us today.

Mr. MORRIS. I would argue we don't necessarily need to have incentives to build new coal plants. We just to have the opportunity to build them with regulation and legislation that provides for trying to make certain they are done in the cleanest potential way that we can. If we have accomplished anything today, we have heard many compliments from you all to us. I would like to compliment you back because what I believe my colleagues have been able to help establish is this is a very true technological challenge that has an acceptable timeline on it if we all begin to work on it.

Mr. ROGERS. More importantly, these are goals that we all support. There isn't a person on this side of the table who doesn't support a cleaner environment and better utilization of coal, and I am certain of that not only at this table but my colleagues in the industry, whether we are municipals, co-ops, or investor-owned utilities.

But it is going to cost more, and we touched on that issue. Congressman Burgess from Texas brought that up. It is very important we understand that. We are all willing to take those steps.

Mr. BUYER. All right, I have a limited amount of time. Who at the table, whether you can discuss right now or please let me know, are preparing to bring online or have in the plans increasing your nuclear capability?

Mr. ROGERS. We are.

Mr. BUYER. We will go right down the line.

Mr. STERBA. Longer-term plans, yes.

Mr. BUYER. Define longer term.

Mr. STERBA. Probably in the 18- to 20-year window.

Mr. BUYER. OK.

Mr. ROGERS. In Cherokee County, South Carolina, we are planning to build a nuclear plant to bring online in 2017, 2018.

Mr. SOKOL. We would like to. We don't know how to today.

Mr. MORRIS. No plans to build new nuclear at this time.

Mr. REASOR. We are working with a current owner of a nuclear facility, which we are part owner, to increase and add another unit to that facility, hopefully to come online by 2014 or 2015.

Mr. LEE. We own existing generation, including nuclear on the Gulf Coast, and we are evaluating and assessing it today to add to

it approximately 2,500 megawatts if it makes sense to do so by 2020.

Mr. BUYER. Keeping in the spirit of Chairman Boucher's opening statements, if you have recommendations to us on how to better incentivize the rebalancing of our portfolio resources and to assist you on the nuclear question, let us know please.

Mr. ROGERS. Congressman, can I qualify—I mean Mike picked up on it, but I think it might have missed the point. When I think of incentives for coal, I don't think of building a coal plant today, unless I am thinking about carbon capture and storage, given the future that I see in front of us. So when I talk about incentives, it is about carbon capture and storage. And it is not only incentives to get it done, but it is investment to allow for more research and development.

Mr. BUYER. Thank you, Mr. Boucher.

Mr. BOUCHER. Thank you very much, Mr. Buyer. The gentleman from Oklahoma, Mr. Sullivan, is recognized for 8 minutes.

Mr. SULLIVAN. Thank you, Mr. Chairman, and I appreciate all of you being here today. One good thing about this job is that we get to have people like you come in front of us, and it is like the best university in the world to be at, and I appreciate you being here.

This is a very exciting time for you to be in this business, isn't it?

Mr. MORRIS. It truly is.

Mr. SULLIVAN. Very complex issues out there, and that is why I was glad this—I guess recently Nancy Pelosi wanted to have a bill to address all these issues by June, and I thought that was pretty ambitious. And I think she has backed off of that a little bit, thank goodness, because I think it is going to require a lot more time and investigation and research to look at all the portfolio of all these different energy needs as we go forward.

Mr. Morris, your company supplies power to the majority of my district.

Mr. MORRIS. Yes, sir.

Mr. SULLIVAN. And I am from Tulsa, Oklahoma and northeastern Oklahoma, and I think it is really neat what you are doing.

Mr. MORRIS. Thank you.

Mr. SULLIVAN. You have got a great sequestration program going on or just starting down in Nelagony, and I just wanted to ask a few questions about that like how are you going to get that into the old oil wells that have been played out, the enhanced oil recovery? Is it going to be piped in there? Did you have to build one, or are you using existing pipeline?

Mr. MORRIS. The process, as you well know, in that part of the State, tremendous amount of existing underground pipeline network. We will simply build the pipe that is needed to come from the capture equipment to the pipeline grid. So it really is a cost-effective place. Now, remember northeastern Oklahoma, that area is blessed with an existing facility, and we think that we will come with a very important partner inside the State of Oklahoma who already has the wells, already has the need, and surely has the intent to join us in that undertaking. We think that is a very important point. To the points made by my colleagues, however, if you are distant, that is an added cost to the whole notion of using CO^2

for an EOR process. But it is well-proven technology that it is a great EOR agent.

Mr. SULLIVAN. And let us say an old well that has been played out, is there some type of percentage of the oil that can be recovered in those enhanced oil recoveries with CO^2 because of the makeup of the molecular structure of it or——

Mr. MORRIS. It would be better to ask a petroleum engineer rather than a biologist lawyer that, but fields that have been played out to the 60 percent range, now they think they can play them out to the 80 percent range. If you look at Chevron's statistics on the Bakersfield in California, which has been producing since the 1940s, I think the numbers are they went from 6,500 barrels a day to over 80,000 barrels a day with enhanced oil recovery technology so——

Mr. SULLIVAN. Even after it has been water flooded?

Mr. MORRIS. After it has been there forever.

I am not exactly sure what they do, and those statistics are available to you.

Mr. SULLIVAN. And is the reason you are doing this in Oklahoma is because of our pipeline infrastructure that we have in the State?

Mr. MORRIS. Exactly.

Mr. SULLIVAN. And because of the old wells that are abundant in Oklahoma?

Mr. MORRIS. Exactly, as well as what we think is a very important asset to public service of Oklahoma and Oklahomans in general, and that is our northeastern station, which is going to be a large-scale application of capture and EOR technology use. Very important for not only our company, but I would say for everybody at this side of the table.

Mr. SULLIVAN. And has your company looked at other ways to—you mentioned earlier, someone did on the panel, about getting the CO^2, and I believe it might be you, Mr. Sterba. That you said that when you get this CO^2, there needs to be a lot more research and development on it, and you said—I believe it was you—several million metric tons of it need to be stored in different formations around the country for a period of time to see, I guess, which ones will hold it the best? I heard that saline is pretty good, but others, there is a potential of migration of the CO^2. Could you explain that?

Mr. STERBA. Well, a single 500-megawatt unit will generate about a little over 4 million tons of CO^2 per year. So that is the magnitude that you are talking about with a single unit. And because geology is different in different parts of the country, we need to have a couple, three, four, five minimum experiments with large scale, at least a million tons or more per year, of injection to make sure that we understand that what the geologists say is going to happen is actually going to happen.

And I also agree with Mr. Morris's comment earlier, but we also have to look for, and this is where real research can come into play, how can we effectively utilize CO^2? Is there a use for this material? I mean I come from a State, New Mexico, where we pump CO^2 out of the ground and send it down to the Permian Basin for enhanced oil recovery. Seems to me there are other things that we can since we are already pulling it out of the ground today.

Mr. MORRIS. Probably be cheaper than a pipeline from Alaska.

Mr. SULLIVAN. Well, and also it was mentioned that if we captured 60 percent of the CO^2, we would have to—I guess someone said that we need about the equivalent of what is used for natural gas pipelines in this country. And I guess CO^2, just like any other kind of gas or jet fuel or oil, crude oil, can use the same pipeline infrastructure, couldn't they? We wouldn't really have to build out too much.

Mr. STERBA. Well, that is true except that the natural gas pipeline system is pretty well stressed today.

Mr. SULLIVAN. OK.

Mr. STERBA. In many instances, there might be some opportunity.

Mr. SULLIVAN. So what you are saying is that would have to be duplicated to actually do this on a widespread basis?

Mr. SOKOL. But make sure, Congressman, that you can't commingle CO^2 and natural gas in the pipeline grid and then put it into your home, my home, or anyone else's. You would have to have the technology of batching a pipeline, which is more common on the liquid side where you might have pentane going down the pipe, and behind that, you might have a kerosene going down the pipe. There are batching technologies that are there, but not commingling of the gases.

Mr. SULLIVAN. OK. Well, thank you very much. I yield back. Go ahead, sir.

Mr. SOKOL. Just one thing, Congressman, if I could. You talked about that this is going to take time.

Mr. SULLIVAN. Yes.

Mr. SOKOL. And there is no question it is, though if there one thing I could urge the committee though is don't take time on the funding side. The slower we are to really put the funding behind technology development for R&D, the farther off the solutions are. So that is one that shouldn't wait.

Mr. SULLIVAN. And I think someone else had an intriguing idea of merging EPA and DOE? Who said that?

Mr. SOKOL. Yes, I am definitely in favor of that. At least they have to look at these problems together instead of them constantly being dealt with as though we live on a different planet.

Mr. SULLIVAN. That is interesting. I like that. Yes, sir.

Mr. REASOR. Congressman, one of our electric cooperatives base, an electric cooperative in North Dakota has put in one of these pipelines and is actually transporting the CO^2. It was about a 200-mile long pipeline. It cost over $250 million to put that in place. So it isn't an inexpensive part of the process.

Mr. MORRIS. But that project—I happened to do the environmental work on that one. American Natural Resources built that plant. We thought it was great. We were churning lignite coal into natural gas, and it worked perfectly in an engineering gas. It made $8 into a $2 market. That became a bit troubling, but now that pipe actually paid for itself because the enhanced oil recovery the Canadians get out of that in their tar sands application has made that a cost break-even undertaking. But it was expensive.

Mr. SULLIVAN. Also, Mr. Morris, I'd love to come out and see that when you——

Mr. MORRIS. We would love to have you come out there, and I hope you know, as everyone else knows, that that is the great home of Will Rogers one of the great Oklahomans.

Mr. SULLIVAN. That is good. Thank you very much. I appreciate it.

Mr. BOUCHER. Thank you very much, Mr. Sullivan. I actually have just one basic question. It has two parts, and it is for the purpose of clarifying some answers that were previously provided by witnesses, not for the purpose of opening any new subject matter. And in view of the fact that our witnesses have been here now for more than 3 hours and have very patiently answered questions from across the committee, Mr. Barton and I have agreed that I will propound questions for 2 minutes, and then he will have an opportunity to propound questions for 2 minutes.

And I would like to ask unanimous consent that we proceed in that order.

Mr. BARTON. I thought it was 20 minutes for me and 2 minutes for you. I will go 2 and 2.

Mr. BOUCHER. So without objection, we will proceed in that fashion, and I will recognize myself for 2 minutes. We have not, as I indicated previously, made any decisions about the mode that we would use for establishing a mandatory program. We have decided to draft a mandatory program and process that through the Congress, but we are leaving to a later date decisions about exactly what the contents of that mandatory program would be. Obviously cap-and-trade is one of the candidates that we are considering.

We want to keep all of our options open, and it was my general understanding that this was also the approach taken by EEI at the time that EEI passed its resolution. And so, Mr. Rogers, my first question is to you just for clarification purposes. When Mr. Barton asked you about your preference for an approach, I think you indicated that cap-and-trade was in fact Duke Energy's preference for an approach.

Mr. ROGERS. Yes, sir.

Mr. BOUCHER. But you then said that is not EEI's position, and I wanted to clarify that what you really meant by that is that EEI has not endorsed cap-and-trade at this point but also has not announced opposition to that, has not taken that option off the table. Is that correct?

Mr. ROGERS. That is correct. Yes, sir.

Mr. BOUCHER. Thank you very much. Then Mr. Inslee propounded the question about who on the panel favors cap-and-trade, and at that point, Mr. Sterba raised his hand, and Mr. Rogers raised his hand, and no one else raised their hands. Mr. Morris said that the reason he had not raised his was because there was no specificity with regard to the details that would surround the cap-and-trade program. So my question to the panel is this. Can we assume, for purposes of our record today, that while Mr. Rogers and Mr. Sterba have endorsed cap-and-trade as the preferred approach, the other witnesses are not taking a position at the present time and simply waiting to see what the details are, but would consider cap-and-trade in the event that the details are appropriate. Would that be a fair way to characterize what the other witnesses' position is, or would you care to make some other statement?

Mr. REASOR. Mr. Chairman, I would just say that I think your analysis is fairly correct. We are not necessarily supporting cap-and-trade. We are not necessarily opposed to it.

Mr. BOUCHER. Thank you Mr. Reasor. That was a perfect statement.

Mr. REASOR. We see that as one part of the entire package. So you would have to see what the entire package encompassed before you made a decision on any one part.

Mr. BOUCHER. That's right. Mr. Sokol.

Mr. SOKOL. I can't eliminate nor include something that the details make all the difference, and so we would view it as an option out there if the details made sense in a broader package.

Mr. BOUCHER. Thank you. Mr. Morris?

Mr. MORRIS. Our position has been relatively clear, that that approach is acceptable to us so long as it is a reasoned and well thought through undertaking in that regard. And I don't think we have to wait until we get to a point where technology has proven to a certainly that we can take those steps. There are many things that we can do along the way, but like my colleague David Sokol, without the details around the process, it would be very hard for us to vote for it. And I am sure you wouldn't take anything out of this committee like that.

Mr. BOUCHER. Thank you, Mr. Morris. That defines my view as well. Mr. Lee.

Mr. LEE. The only other caveat I would say, Mr. Chairman, is that we have said we didn't think cap-and-trade was appropriate, but if this committee in its infinite wisdom decides to say that it is, we certainly want to be a part of that process to evaluate that with you and work with you to determine what it is.

Mr. BOUCHER. Thank you very much, Mr. Lee. Thank you gentleman. Well, I have consumed 3½ minutes, and so Mr. Barton is recognized for 3½ minutes.

Mr. BARTON. Well, I will try to give you some time back. You didn't ask my opinion of cap-and-trade, Mr. Chairman, but put me down as opposed to mandatory cap-and-trade. And I actually have a vote on the committee, so that might be worth knowing.

To try to show some positivism, are all the members of this panel supportive of the FutureGen project to find a way to develop the technology for mandatory carbon capture, sequestration or CO^2? Are you all supportive of that?

Mr. MORRIS. Well, not all of us are members of that. We might be supporting. Some of us are financial——

Mr. BARTON. How many are putting your money where your mouth is and have actually signed up in the FutureGen Alliance? We will let the record show that Mr. Morris. The rest are not, but you are supportive of the project?

Mr. SOKOL. Yes, Mike has put his money where several of our mouths are.

Mr. LEE. And we also support the project coming to Texas.

Mr. SOKOL. We are putting money into something that can be brought online sooner, and that is IGCC in Edwardsport, Indiana.

Mr. BARTON. OK, I want to also put on the record that we have in current law in the Energy Policy Act a program that authorizes, I believe, $3 billion where the industry goes out in conjunction with

the Department of Energy to retrofit existing coal-fired power plants with the newest available technology. And that has been authorized by the Act. It hasn't been funded by the Bush administration, but that would be another avenue that is currently in law that can help in this area.

Mr. SOKOL. And we have every intention to take advantage of that opportunity with the projects that I announced earlier, Congressman.

Mr. BARTON. OK, and I want to clarify an answer that Mr. Sokol gave while I was out of the room, but I was watching on my television set in my office. I believe that you told one of the other members of the committee that if we went to a mandatory cap-and-trade system for carbon immediately, it would double the retail price of electricity. Did I hear you correctly?

Mr. SOKOL. Not exactly. If $30 per ton was set as the cost of CO^2 emissions, it would double the cost of generation in our——

Mr. BARTON. Double the cost of generation?

Mr. SOKOL. Right, which would—we are about 50 percent generation, 50 percent transmission/distribution is a rough breakdown of our cost. So it would have that 50 percent increase then in the delivered cost of electricity.

Mr. BARTON. OK. But there is not anybody on the panel that disputes that if we went to something fairly quickly with existing technology, the rates, the retail rate to the average consumer would go up considerably. Is that a fair statement?

Mr. SOKOL. Yes, sir.

Mr. BARTON. Everybody agrees with that? Well, I thank you, Mr. Chairman. I just have a question for Mr. Lee. Are the lights going to be on in the Alamodome, heated or cooled as the case may be, when the Fighting Texas Aggies beat the fool out of the Memphis whatever they are this Thursday down in the Alamodome?

Mr. LEE. The answer is yes, Congressman.

Mr. BARTON. We will worry about the Buckeyes if we can get past Memphis.

Mr. LEE. But the lights will be on, and the Alamodome will be very cool.

Mr. BARTON. Thank you, and I yield back, Mr. Chairman. Thank you.

Mr. BOUCHER. Thank you very much, Mr. Barton, and let me say thank you once again to these witnesses. Your testimony today has been really excellent. We have heard comments from the members of this committee on both sides about how much they appreciate this hearing and appreciate what you have done to enlighten us regarding the views of the electric utility industry. And we look forward to working closely with you as we take further steps in this process. This hearing is adjourned.

[Whereupon, at 1:35 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

Written Testimony of Milton B. Lee
General Manager and CEO
CPS Energy – San Antonio, Texas
Before the U.S. House Committee on Energy and Commerce
March 15, 2007

Good afternoon Mr. Chairman and Members. My name is Milton Lee, and I am General Manager and CEO for CPS Energy. I appreciate the opportunity to address the committee today, and hope I can make a positive contribution to your deliberations.

Background: CPS Energy is a Municipal Electric and Gas Utility owned by the citizens of San Antonio, Texas. As a municipal utility, CPS Energy belongs to a class of utilities termed public power utilities. Public power utilities have no stockholders or shareholders: no investors. Our owners are the citizens of our communities and they expect their public power utilities to represent their interests by providing reliable, affordable power in an environmentally sound fashion.

Numerically, public power utilities are the most numerous utility types – representing over 60% of the more than 3,200 electric utilities operating in the US. Numerous though we are, the overwhelming majority of public power utilities are small distribution utilities that have no capability of generating their own power. Public power serves about 16% of the US electric load, and only the largest public power entities, such as CPS Energy generate their own electricity. However, data collected by the American Public Power Association (APPA), a trade group representing public power interests, clearly demonstrates that public power leads the nation in operating cleaner power plants,

investment in renewables and conservation and by being quick to adopt new environmental initiatives that serve the interests and demands of our customers. Our commitment to environmental excellence is second to none.

Public power makes no profit; we exist to serve the needs of our customers by providing them with reliable and affordable power. Our prices are set, not at what the market will bear, but at a level sufficient to cover our costs and sustain a reasonable reserve for repairs and replacement of capital equipment. Some public power entities, such as CPS Energy, also contribute to their city's general fund. Public power's straight forward system of financing projects combined with a conservative, low risk approach to conducting business, results in very favorable bond ratings which , in turn, leads to low interest rates – that are passed on to our constituents in the form of lower costs for electricity.

Of course public power is subject to the same economic realities that affect all sectors of the economy. When the price of an important fuel increases, such as natural gas, those increases must be paid and passed along to the ultimate consumer. This has happened in Texas and, in fact, is the subject of significant discussion by the Texas Legislature, currently in session. Gas price increases have fueled electric rate increases all across Texas.

Public power utilities are governed either by elected public officials such as city councils or by boards of appointed or elected individuals – it is truly local governance, subject to open meetings and open records requirements that assures that local issues are adequately addressed. Public power utilities treat their revenues as public funds, are subject to strict purchasing regulations and major decisions are well vetted within the

community. Consequently, decisions are made in a deliberate and conservative fashion that is open to full public disclosure. Major capital programs can take significantly longer to develop under public governance than under private management. The longer decision making timeframes required by public power utilities need to be accounted for in any policies mandating major capital expenditures or fixed deadlines. Furthermore, policymakers should recognize that the principle vehicle used to spur environmental enhancement and alternate energy programs in the past has been through the granting of tax credits. These tax credits are not available to public power so any legislation envisioning the use of tax credits to spur development should include comparable provisions for public power.

An Example: the case of CPS Energy and the citizens of San Antonio. I would like to cite a recent example from our history in San Antonio. San Antonio, by current population estimates, is the seventh largest city in the US and is growing at a rate of about 18% each decade. However, San Antonio is not blessed with great economic wealth. Personal income is only 87% of the national average and about 18% of our citizens live below the poverty level. Furthermore, San Antonio's summers can be brutal with daily temperatures often exceeding 100 degrees – and can climb to above 110 degrees on occasion. Air conditioning is not just a luxury in San Antonio, it is a necessity and air conditioning requires a lot of electricity. This then is CPS Energy's challenge – to provide reliable, affordable and environmentally sound energy to a constituency that is economically disadvantaged to a significant degree. How well has CPS Energy met this task? Last year CPS Energy generated more than 22 billion KWH

of electricity, enough to meet all our customer' demands, and the average cost paid by our residential consumers was less than 8 cents per KWH. This rate is the second lowest of the 20 largest cities in America. While maintaining these low rates, CPS Energy operates one of the most optimally diversified generating portfolios in the nation, consisting of renewable energy (wind and landfill gas), natural gas, nuclear and coal. About 40% of CPS Energy's generation is produced without any air emissions at all. CPS Energy's generation mix produces electricity with emissions of regulated pollutants that are 60% lower than the national average and that are 13% lower than the national average for CO_2 emissions. (Note: I will be referring to CO_2 emissions throughout this testimony. I use CO_2 as a surrogate representing all greenhouse gases.) Also, CPS Energy's existing coal units are substantially cleaner than the national average as well. CPS Energy is currently building a coal unit that will be cleaner than any coal unit presently operating or under construction in the U.S.

In some areas of the country there is significant and growing opposition to the construction of new coal units, but in San Antonio our new coal unit did not incur widespread opposition. Support for the coal plant was gained through substantial effort that began in 2001 with the development of a strategic energy plan that called for more renewables, more conservation and more coal. This plan was then subjected to public scrutiny for two years, including the creation of a citizen's advisory committee and conducting numerous public meetings in every sector of the community. Finally, two more years were spent during the formal licensing process before the Texas Commission on Environmental Quality (TCEQ). The final permit was issued on December 28, 2005 – almost 5 years after beginning the new unit process.

CPS Energy's constituents made it clear that, additional coal generation was acceptable only if it would be as clean or cleaner than any coal unit previously built and only if new emissions were more than offset by reductions from other CPS Energy coal units. CPS Energy has agreed to build the cleanest coal unit in the nation, achieve 15% renewables by 2020 and embark upon a $500 million environmental improvement program that will result in an emissions reduction of 60% from baseline levels, even including the emissions from the new plant. This is how a public power utility serves its constituency and wins support for new projects – by listening and responding to the concerns voiced by its constituents. When all these programs are completed, CPS Energy will own the cleanest fleet of coal units in the nation, will have one of the highest percentages of non-hydroelectric renewables in its generation portfolio of any major utility in the nation and will still have the lowest cost of electricity of any major city in the state.

Recommendations on climate change regulation: Since CPS Energy has recently begun construction of a new coal plant, a plant that was subject to a most rigorous public involvement program, many of the issues now being dealt with by this Committee were at issue during the public phase of our recent project. Accordingly, CPS Energy's engineers and consultants have given careful thought to these matters and have relied upon the most current available information in forming their opinions. As I said previously, the new CPS Energy coal plant currently under construction and scheduled for completion in late 2009 will be the cleanest coal unit in the nation – based upon the permit conditions imposed for the regulated pollutants. At the time the permit application

was submitted (November 2003), CPS Energy could find no permit, existing or proposed, that contained more stringent limitations, in total, for the entire suite of regulated pollutants covered by the permit application for any project that was subsequently built or started. Even recently issued permits do not match the emission levels proposed by CPS Energy more than 3 years ago.

The regulated pollutants included in the permit for CPS Energy's new plant do not include CO_2. Although CO_2 issues were considered during the 2 year permitting process, there was no regulatory or technological means to regulate these emissions. Furthermore, after exhaustive analysis, CPS Energy's engineers and consultants concluded that the technology for removing CO_2 emissions from the flue gas was not sufficiently developed to warrant serious consideration during the permitting process. The studies indicated that CO_2 removal would increase the cost of a new coal plant by 50% and would lower its efficiency by more than 40%. These economic and operational penalties would be unprecedented in the history of air pollution control regulation and provide a clear signal that additional research and development is needed before CO_2 removal could be considered a viable option. However, CPS Energy is providing financial support for CO_2 capture research currently being undertaken by EPRI and other utilities.

Also considered during the licensing phase was the construction of an Integrated Gasification Combined Cycle (IGCC) unit instead of the pulverized coal unit that was ultimately selected. IGCC units are often discussed around the nation but discussion seems to be about as far as the process gets for that particular technology. When CPS Energy began its strategic planning process back in 2001, there were only two operating

coal fired IGCC units in the US and only 4 coal fired IGCC units in the world. Today, some five years later there are still only 4 coal fired IGCC units in the world. During the preparation of the permit application, CPS Energy engineers identified about a half dozen or so IGCC units that either had construction permits or had their permits in the works. Today, more than 3 years later none of those IGCC units have begun construction in earnest.

During our strategic planning process, CPS Energy identified IGCC as a technology that had some promise but which was not yet ready for "prime time". Nothing in the ensuing 5 or 6 years has caused us to question that evaluation. Today, IGCC a promising technology which appears to be significantly more expensive to build and operate than a conventional pulverized coal unit, is predicted to be less reliable than a pulverized coal unit and apparently provides no materially significant reduction in CO_2 emissions over a pulverized coal unit.

CPS Energy did commission the first detailed evaluation comparing IGCC and pulverized coal technologies with carbon capture when using coals such as subbituminous and lignite. This study was performed by the Electric Power Research Institute (EPRI) and the engineering firm of Burns and McDonnell and produced the finding that a pulverized coal unit with carbon capture shows promise of being less expensive and more reliable than an IGCC with carbon capture, at least when burning subbituminous and lignite coals. CPS Energy funded this study for a cost of about $600,000 and is available from the public access section of the EPRI website.

The investigations and evaluations conducted by CPS Energy over the last several years provide an opportunity for us to express a few opinions regarding the current

discussions of greenhouse gas policy and how it relates to the utility sector. Those opinions and recommendations now follow:

Recommendation 1). Given the extreme complexity and seriousness of the issues at hand and taking into account the multiplicity of desirable outcomes of any legislation – protection of the environment, preservation of economic health and vitality, national security and global cooperation, the committee should undertake its deliberations with all due consideration and without regard to artificially imposed or impractical deadlines or timelines. Congress deals with many complex issues, and certainly this issue has national and global economic implications. Improperly done, this legislation could adversely impact the economic health of the US with no positive impact on climate change. Proceed, but proceed with caution.

Recommendation 2). Global climate change policy and regulation should include all greenhouse gases. This would include methane, nitrous oxide, sulfur hexafluoride, the hydrochlorofluorocarbons and any other contributing greenhouse gases, not just CO_2. Priority consideration should be given to the major contributors that provide the best opportunity to decrease future greenhouse projections.

Recommendation 3). Global climate change should include all members of the global community and they should be expected to commit to a program of greenhouse gas emissions reduction. In the event that other significant emitters fail to meet goals and objectives, legislation should provide a safety valve, perhaps by extending any self imposed deadlines that would preserve the economy of the US while steps are taken to assure that the rest of the global community remains on track with their emissions reductions.

Recommendation 4). Some have suggested that the climate change legislation be aimed at only one industry – the electric utility industry. This would be a mistake because that approach fails to recognize that electric utilities emit roughly a third of the nation's CO_2 emissions. Also, the electrical industry contributes almost none of the very potent and climatically significant other greenhouse gases which may be the most economically effective approach to take during the initial years of any long term climate protection program. Any legislation must be applicable to all sectors of the economy, not limited to just the electric utility industry.

Recommendation 5). Current technology for carbon capture and sequestration for fossil fuel generation does not adequately support the effective implementation of a cap and trade program for CO_2 at the present time. Additional technology research, development and demonstration programs must precede any effective implementation of a cap and trade program.

Recommendation 6). Coal, which represents approximately 95% of this country's fossil fuel reserves and is used to produce approximately 50% of the electric power, should be recognized as a vital energy resource for the foreseeable future. Legislation should not limit our flexibility to rely on this domestic fuel source.

Recommendation 7). Legislation should be based upon a phased approach to resolving the problem. The first phase should be predicated on slowing the future increasing rate of greenhouse gas emissions and development of base load generating technologies that can reduce CO_2. The second phase should be based upon stabilizing the levels of greenhouse gas emissions and should entail demonstration and deployment of new technologies. The third phase should begin to see reductions in the levels of

greenhouse gas emissions. Congress should develop a reasonable timeline for these phases based upon the objectives of preserving economic growth, developing the technologies needed to accomplish these goals and allowing time to deploy these technologies.

Recommendation 8). Public power and private utilities have different governance structures that has led to discrepancies in the availability of certain federal incentives. Policymakers should recognize that the principle vehicle used to spur environmental enhancement and alternate energy programs in the past has been through the granting of tax credits. These tax credits are not available to public power so any legislation envisioning the use of tax credits to spur development should include comparable provisions for public power.

Mr. Chairman, that concludes my prepared remarks. Thank you again for the opportunity to address the committee. I am available to answer any questions you may have at this time.

Testimony of

Michael G. Morris

Chairman, President, and Chief Executive Officer

American Electric Power

Before the House Energy and Commerce Committee March 20th 2007

Good morning Mr. Chairman and distinguished members of the House Committee on Energy and Commerce.

Thank you for inviting me here today. Thank you for this opportunity to offer the views of American Electric Power (AEP) and for soliciting the views of our industry and others on climate change technologies and policies.

My name is Mike Morris, and I am the Chairman, President, and Chief Executive Officer of American Electric Power (AEP). Headquartered in Columbus, Ohio, we are one of the nation's largest electricity generators -- with over 36,000 megawatts of generating capacity -- and serve more than five million retail consumers in 11 states in the Midwest and south central regions of our nation. AEP's generating fleet employs diverse sources of fuel – including coal, nuclear, hydroelectric, natural gas, and oil – and wind power. But of particular importance for the Committee members here today, AEP uses more coal than any other electricity generator in the Western hemisphere.

AEP Voluntary Climate Actions

Over the past decade, American Electric Power has implemented a broad portfolio of voluntary actions to reduce, avoid or offset greenhouse gas (GHG) emissions. In addition, we

continue to invest in new clean coal technology plants and R&D that will enable AEP and our industry to meet the challenge of significantly reducing GHG emissions over the long term. For example, AEP is designing and will build two new generating plants using Integrated Gasification Combined Cycle (IGCC) technology in West Virginia and Ohio, as well as two highly efficient new generating plants using the most advanced (e.g., ultra-supercritical) coal combustion technology in Oklahoma and Arkansas. We are also playing a leading role in the FutureGen project, which, once completed, will be the world's first near-zero CO_2 emitting commercial-scale coal-fueled power plant. This plant will capture and sequester 90 percent of its (GHG) emissions.

Since joining the Chicago Climate Exchange and EPA Climate Leaders several years ago, AEP has voluntarily reduced its GHG emissions during 2003-05 by a total of 31 million metric tons of CO_2 equivalent. We did so by planting tens of millions of trees, adding several major wind generation projects, significantly increasing the generating efficiency of our larger coal-fired power plants, mothballing or retiring older and less efficient coal- and oil/gas-fired steam units, and achieving record levels of generation from our zero-emitting Cook Nuclear plant.

AEP's Major New Initiative to Reduce GHG Emissions

Just this past week, I have announced several major new initiatives to reduce AEP's GHG emissions and to advance the commercial application of carbon capture and storage technology. Our company has been advancing technology for the electric utility industry for more than 100 years. AEP's recent announcement continues to build upon this heritage. Technology development needs are often cited as an excuse for inaction. We see these needs as opportunities for action.

AEP has signed a memorandum of understanding (MOU) with Alstom, a worldwide leader in equipment and services for power generation, for post-combustion carbon capture technology using

Alstom's chilled ammonia system. It will be installed at the 1300-megawatt Mountaineer Plant in New Haven, W.Va as a "30-megawatt (thermal) commercial performance verification" project in mid-2008 and capture up to 100,000 metric tons of carbon dioxide (CO_2) per year.

Following the completion of commercial verification at Mountaineer, AEP plans to install Alstom's system on one of the 450-megawatt coal-fired units at its Northeastern Plant in Oologah, Oklahoma. The system is expected to be operational at Northeastern Plant in late 2011, capturing about 1.5 million metric tons of CO_2 a year. The CO_2 captured at Northeastern Plant will also be used for enhanced oil recovery.

Just this past week, AEP voluntarily committed to achieve an additional five million tons of GHG reductions annually beginning in 2011. We will accomplish these reductions through a new AEP initiative that will add another 1000 Mw of purchased wind power into our system, substantially increase our forestry investments (in addition to the 62 million trees we have planted to date), as well as invest in domestic offsets, such as methane capture from agriculture, mines and landfills.

AEP Perspectives on a Federal GHG Reduction Program

While AEP has done, and will do much more, to mitigate GHG emissions from its existing sources, we also support the adoption of an economy-wide cap-and-trade type GHG reduction program that is well thought-out, achievable, and reasonable. We believe legislation can be crafted that does not impede AEP's ability to provide reliable, reasonably priced electricity to support the economic well-being of our customers, and includes mechanisms that foster international participation and avoid creating inequities and competitive issues that would harm the U.S. economy. AEP supports reasonable legislation, and is not calling for an indefinite delay until advanced technology such as carbon capture and storage (CCS) is developed. However, as the requirements

become more stringent during the next ten to twenty years, and we move beyond the ability of current technology to deliver those reductions, it is essential that requirements for deeper reductions coincide with the commercialization of advanced technology.

A sound national policy for reducing GHG emissions, based on a cap-and-trade type approach, should include the following design elements:

- The cap should apply to all sectors of the economy and cover all greenhouse gases.
- An unfettered cap-and-trade framework should be used to maximize flexibility and minimize the costs of the program.
- The reduction levels should be gradually phased in over time to reflect the lead-time necessary for demonstrating and deploying new low-and zero-emitting technologies on a broad commercial scale. Setting reasonable and achievable emissions caps is critical to ensure that the power industry can provide reliable electricity and ensure the continued economic competitiveness for U.S. workers and industries.
- Minimize costs through unrestricted use of real and verifiable domestic and international GHG emissions offsets, such as methane capture from landfills, livestock and coal mines, forestry and agricultural sequestration and clean power development.
- As part of a comprehensive cap and trade system, all allowances should be allocated based on historic emissions without cost to the electric power sector and other sources that will be required to make reductions. At most, only a small number of the allowances (less than five percent) should be distributed through auctions or set-asides for general public benefit purposes. This approach is

essential to minimize the cost burden to retail consumers, to safeguard competitiveness of U.S. industries, and to avoid harm to the U.S. economy.

- Recognition should be provided to those companies that have voluntarily taken early actions and investment to mitigate GHG emissions.
- Long-term public and private funding should be provided to develop commercially-viable technology solutions (*e.g.*, carbon capture and storage for new and existing plants and other clean-coal technologies).
- Legislative provisions should be included to eliminate the legal and regulatory barriers to the use of carbon capture and storage, nuclear, wind or other low or no-carbon technologies or processes.
- Regulatory pre-approval should be provided for utilities to recover the costs of effective energy efficiency and demand-side management programs.
- A safety valve for purchasing allowances should be included to establish a price ceiling and be set at a level that adequately protects the U.S. economy.
- Statutory provisions should be included for addressing inequities that will result if the largest emitters in the developing world, who are manufacturing competitors with the U.S, fail to take comparable action to cap or reduce their own emissions.

All Greenhouse Gases Should be Covered, on An Economy-Wide Basis

AEP believes mandatory emission reduction legislation must be premised upon a market-based cap-and-trade system that includes all significant emitting sectors of the U.S. economy. With regard to greenhouse gases and specifically CO_2 emissions, no one sector accounts for a majority of U.S. emissions. Instead, GHG emissions are ubiquitous, generated by multiple sectors, including

electricity generation, transportation, various manufacturing processes, and residential and commercial fuel use. Adopting an economy-wide approach will improve the overall effectiveness of limiting GHG emissions nationally and expand opportunities to achieve those GHG reductions in a least-cost manner, while spreading the cost across the entire economy. The overall cost of the program will be lowered by enabling companies to take advantage of the most cost-effective reductions possible from all major source categories across the economy. An economy-wide approach prevents distortions driven by imposing disproportionate burdens on certain sectors while excluding others. In contrast, a sector approach – if limited to electric generating units and other large combustion sources – arbitrarily limits reduction obligations and costs to these sources. AEP urges that any cap-and-trade program not only be economy-wide, but also assign a compliance burden to each sector that is consistent with that sector's contribution to the problem.

Phased-in Timing and Gradually Increasing Level of Reductions Consistent with Technology Development

As a practical matter, implementing climate legislation is a complex undertaking that will require procedures for measuring, verifying, and accounting for GHG emission, as well as for designing efficient administration and enforcement procedures applicable to all sectors of our economy. Only a pragmatic approach with achievable targets and reasonable timetables – that does not require too many reductions within too short a time period – will succeed. Past experience with the Clean Air Act Amendments of 1990 (which involved a vastly simpler SO_2 allowance trading system for just the electric power sector), strongly suggests that a minimum of five years will be necessary to have the administrative mechanisms in place for full implementation of the initial GHG emission targets.

AEP also believes that the level of emissions reductions and timing of those reductions under a federal mandate must keep pace with developing technologies for reducing GHG emissions from new and existing sources. The technologies for effective carbon capture and storage from coal-fired facilities have not yet been perfected, and cannot be artificially accelerated through unrealistic reduction mandates.

While AEP and other companies have successfully lowered their average emissions and emission rates during this decade, further substantial reductions will require the wide-scale commercial availability of new clean coal technologies. AEP believes that the electric power industry can potentially manage much of the expected economic (and CO_2 emissions) growth over the course of the next decade (2010-2020) through aggressively deploying renewable energy, further gains in supply and demand-side energy efficiency, and new emission offset projects. As stated above, AEP supports reasonable legislation, and is not calling for an indefinite delay of GHG reduction obligations until advanced clean coal technology is developed. However, as the reduction requirements become more stringent, and move beyond the ability of current technology to deliver those reductions, it is important that those stringent requirements coincide with the commercialization of advanced technology. This includes the next generation of low- and zero-emitting technologies. In the case of coal, this means demonstration and full-scale deployment of new IGCC units with carbon capture, new ultra-supercritical or oxy-fuel coal plants with carbon capture and storage, as well as broad deployment of retrofit technologies for carbon capture and storage at existing coal plants. The next generation of nuclear technology will also play an important role in meeting significant reduction targets.

However, today's costs of new clean coal technologies with carbon capture and storage are much more expensive than current coal-fired technologies. For example, carbon capture and storage

using current inhibited monoethanolamine (MEA) technology is expected to increase the total costs of a new coal fired power plant by about 60-70 percent and even the newer chilled ammonia carbon capture technology we plan to deploy on a commercial sized scale by 2012 at one of our existing coal-fired units will result in significantly higher costs. It is only through the steady and judicious advancement of these applications during the course of the next decade that we can start to bring these costs down, in order to avoid substantial electricity rate shocks and undue harm to the U.S. economy.

In summary, AEP recommends a pragmatic approach for phasing in GHG reductions through a cap-and-trade program. The emissions cap should be reasonable and achievable. In the early years of the program, the cap should be set at levels that slow the increase in GHG emissions. Allowing for moderate emissions increases over the first decade is critical due to limitations on currently available GHG control options. The stringency of the cap would increase over time – first stabilizing emissions and then requiring a gradual, long-term decline in emissions levels. The cap levels should be set to reflect projected advances in new carbon-saving technologies. In the case of the electric power sector, additional time is necessary to allow for the deployment of new nuclear plants as well as the demonstration and deployment of commercial-scale gasification and advanced combustion facilities fully integrated with technologies for CO_2 capture and storage. Substantial GHG reductions should not be required until after the 2020 time frame.

Requiring much deeper reductions sooner would very likely harm the U.S. economy. For AEP and the electric sector, the only currently available strategy to achieve substantial absolute CO_2 reductions prior to 2020 without the full-scale deployment of new technologies will inevitably require much greater use of natural gas, in lieu of coal-fueled electricity, with the undesirable effects of higher natural gas prices and even tighter supplies.

Unrestricted Use of Real and Verifiable Emission Offsets of All Greenhouse Gases

GHG emissions and compliance costs will both be reduced, if all real and verifiable emission credits and offsets are included in any federal legislative program. Climate change is a global problem. Greenhouse gases emitted, avoided or reduced anywhere on Earth ultimately impact the entire globe. Artificially restricting reduction opportunities only increases the cost of compliance.

As an example, some project-based offsets are relatively low in cost because they involve high global warming potential (GWP) gases such as methane and nitrous oxides that can be captured with relatively little investment per CO_2 equivalent ton reduced. Forestry projects often provide lower cost reductions than direct reductions at industrial sources or power plants. In addition, many project-based offsets provide significant land use, aesthetic and other environmental benefits.

Viewed from a global perspective, any given reduction, anywhere, from any source, has the same benefit as any other – so the use of the most economically-prudent, real and verifiable offsets should be strongly encouraged, including offsets arising from initiatives involving forestry, agriculture, methane capture from livestock manure, landfills or coal mines, or other innovations.

Emission Allowances Should be Allocated Equitably in a Cap-and-Trade System with Limited Auctions

Under various proposed cap-and-trade systems, an emission allowance would permit the release of one ton of CO_2 or equivalent and are distributed in limited amounts up to the total GHG emissions cap. This limit on the supply of total allowances results in a market price being set for allowances based on the marginal control costs under the cap-and-trade program. Allocation of these

allowances to companies equitably and efficiently is an important principle in allowing a cap-and-trade system to be successful.

If, for example, an electric utility generator under cost of service regulation is allocated emission allowances substantially equal to the GHG emissions permitted by legislation, the cost to consumers eventually is equivalent to the actual cost of reducing or offsetting GHG emissions to the level of the cap. The U.S. has already perfected just such a highly efficient allowance trading system, and it is now successfully being used to address Acid Rain and other national and regional domestic air quality issues. As a result, AEP strongly recommends that emission allowances be allocated to electric utility generators based on "input fuel" or emissions. Input-based allocations spread the reduction/cost burden evenly and equitably, by distributing emission allowances pro-rata based on historic emissions. So, all existing fossil fuel generating plants would face a similar effective percent reduction requirement. In this way, allowances are distributed to those companies who must bear the burden of reducing CO_2 emissions. Emission/fuel based allocation methods successfully allocated allowances under the Clean Air Act of 1990 (for SO_2), as well as EPA's recent Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule (CAMR) rules governing SO_2, NOx and Hg in the future.

Under this approach a high percentage of the available allowances (e.g., 95-100 percent) would be allocated to electric generators based upon their pro rata share of historical GHG emissions.

AEP supports the use of input fuel or emissions-based allocations among the sources actually emitting regulated pollutants and required to achieve emission reductions. Input fuel-based systems maintain the critical connection between the sources required to achieve reductions and the allowance system used to demonstrate compliance, and have a demonstrated history of successfully and substantially reducing overall costs of compliance through the use of this market mechanism. All proposed climate or clean air legislation requires emission reductions only from fossil fuel-fired

utility plants. The allowances should be distributed to those companies who must bear this burden. In contrast, output-based allocation systems provide substantial windfalls for a few companies with significant amounts of nuclear, hydro and/or natural gas generation. Nuclear, hydro and renewables do not have any CO_2, SO_2, NOx or mercury emissions and thus they have no need for the permits for these emissions. Allocating allowances to nuclear and hydro serves only one purpose -- to force fossil fuel-fired generation to buy them back. This represents a direct income transfer from fossil generation to non-emitting sources.

Allocation of allowances to the electric power sector over time must also recognize the continuing and increasing electrification of our economy. As new innovative electro-technologies such as plug-in hybrid electric vehicles become a more significant part of the mix of options to meet future U.S. energy needs and to reduce our GHG emissions, allowance allocations will need to recognize the greater share of U.S. energy needs that electricity generators provide.

AEP supports auctioning five percent or less of the available allowances in order to set an initial market price to facilitate trading, reduce barriers to the entry of new sources, and provide incentives for technological advances and early action to mitigate emissions. However, AEP opposes any proposed cap and trade program with any significant auctions (or set-aside of allowances for public benefit purposes), since these would disproportionately increase compliance costs with no offsetting decrease in GHG emissions.

Auctioning allowances rather than allocating them to electric generators will simply increase electricity generating costs and electricity rates unnecessarily. Under cost of service regulation, the cost of auctioned allowance purchases would be – by necessity – passed on to consumers in addition to the direct costs of compliance. Under an auction, consumer costs and electricity prices would increase substantially more than under a system with no auctioned allowances.

In addition to increased electricity rates for consumers, auctioning a substantial number of emission allowances would cause a major redistribution of income, reduce market efficiency and impair companies' ability to make the needed reductions. Investment in compliance technologies would be forced to compete with large-scale investments needed by private companies to purchase auctioned allowances, even as coal-fired electricity generators make very large investments throughout the next decade to reduce SO_2, NOx and Hg emissions under existing and upcoming Clean Air Act regulatory requirements.

Finally, auctioning a substantial number of emission allowances will affect various regions of the country differently. States and regions in the U.S. that rely more heavily on coal-fueled power, including Michigan, North Carolina, Georgia, Ohio, West Virginia, Indiana, Kentucky, Tennessee, Iowa, Missouri, Oklahoma, Wisconsin, Minnesota, and most of the Western U.S. are likely to experience the largest cost and rate increases due to auctions. For these reasons, any decision to auction substantial number of allowances must compensate for the disproportionate impacts on America's coal-reliant states and regions if Congress is to minimize the economic hardships on specific states, regions, and the nation as a whole.

Recognition of Early Actions that Achieve Real and Verifiable GHG Emission Reductions

Any federal program needs to provide credit for real and verifiable early reductions made on a company-wide basis. Programs such as EPA Climate Leaders, DOE Section 1605(b) and the Chicago Climate Exchange among others provide the appropriate accounting and auditing mechanisms to ensure that the reductions are real and verifiable.

AEP is proud of its accomplishments in reducing its CO_2 and other GHG emissions voluntarily. We believe that early actors such as our company should be rewarded, and not penalized for being proactive in addressing their GHG emissions.

Congressional Action Must be Premised Upon that the Reality That Climate Change is caused by GHG Emissions on a Global Basis

We must keep in mind the context for our nation undertaking extraordinary efforts to limit our domestic GHG emissions. Humanity is confronting worldwide climate change; this is not purely a domestic issue. It would be unconscionable to pass legislation that imposes unilateral caps only upon America's economy, while ignoring the fact that U.S. reductions will make little difference if other major emitting nations are not taking comparable action. Any reductions we make will be overtaken – literally swallowed up – by huge and rapidly increasing emissions arising from the largest emitters in the developing world. This would be flawed environmental policy and will accomplish very little to deal with global climate change.

Of equal importance, legislation must address the fact that imposition of emission limits by some, but not all, major emitting nations would adversely impact the competitive conditions of trade between nations. This could actually create perverse incentives to inappropriately drive environmentally-responsible American jobs to nations without emission limits, where their production costs would assuredly be less. This scenario would impact America's manufacturing sectors and workers alike – and the potential effects of such a non-global solution could, in a very real sense, undermine our competitiveness in our increasingly global economy.

These sort of practical concerns prompted Mr. Edwin D. Hill, International President of the International Brotherhood of Electrical Workers and me to collaborate in crafting a recent op-ed. The

AEP/IBEW approach reconciles the environmental and economic nexus that frames the global climate issue -- "Trade is the Key to Climate Change" (see copy attached). In this article we offered recommendations on how trade considerations must be part of any U.S. legislation that also requires mandatory domestic emission reductions.

In this article we suggest that any U.S. legislation that would require mandatory U.S. emission reductions must also include a market mechanism that encourages other major GHG-emitting countries to reduce their emissions. If other countries refuse to reduce emissions but seek to continue to sell their goods in the U.S., our proposal would implement an appropriate measure to equalize the conditions of global trade. This measure could include a requirement that emission allowances accompany such imports, or border adjustment taxes that are functionally equivalent to America's domestic GHG initiatives, to be applied to products arriving from countries that do not limit their greenhouse gas emissions,. Alternatively, the U.S. government could suspend or reduce the stringency of the domestic program until those countries join.

In the best tradition of America's free market cap-and-trade policies, Ed Hill and I believe this approach offers the very real potential to equalize the conditions of global trade with regard to climate change, and to serve as a powerful impetus for other nations to meaningfully join a new global initiative. We are hopeful that all major emitting nations would find it prudent to participate rather than be compelled to pay border adjustment taxes or purchase significant numbers of allowances to offset GHG emissions arising from their production of exported goods and services, especially if they have the opportunity to also derive even greater benefits for their citizens and the world from cleaner development through treaty participation.

This approach would equalize the conditions of global trade with regard to climate change, and it would be a powerful incentive for nations to meaningfully participate in a new world-wide initiative to limit their GHG emissions.

Without an ironclad statutory backstop, the U.S. will have little leverage to negotiate with rapidly developing nations. If Congress were to fail to include these or similar provisions, it would fail to deal with climate change on a global scale because our own GHG emissions would be capped even as other nations' emissions increase and eclipse our own, further endangering our global environment and welfare. I believe American consumers, workers and businesses are ready, willing and able to do their part to address the risks presented by global climate change. But fair play and common sense dictate that we must not do this alone.

While Trade is the Key to Climate Change, Technology is the Answer

The primary human-induced cause of global warming is the emission of CO_2 arising from the burning of fossil fuels. Put simply, our primary contribution to climate change is also what drives the global economic engine.

Changing consumer behavior by buying efficient appliances and cars, by driving less, and by similar steps, is helping to reduce the growth of GHG emissions. However, these steps will never be nearly enough to significantly reduce CO_2 emissions from the burning of coal, oil and natural gas. Such incremental steps, while important, will never be sufficient to stabilize greenhouse gases concentrations in the atmosphere at a level that is believed to be capable of preventing dangerous human-induced interference with the climate system as called for in the U.S.-approved U.N. Framework Convention on Climate Change (Rio agreement).

For that, we need major technological advances to effectively capture and store CO_2. The Congress and indeed all Americans must come to recognize the gigantic undertaking and significant sacrifices that this enterprise is likely to require. It is unrealistic to assume, and wrong to argue, that the market will magically respond simply by the imposition of severe caps on CO_2 emissions. The result will not be a positive response by the market, but rather a severe impact on the economy. Not when what we are talking about, on a large scale, is the capture and geologic storage of billions and billions of tons of CO_2 with technologies that have not yet been proven anywhere in the world.

Carbon capture and storage (CCS) should not be mandated until and unless it has been demonstrated to be effective, and the costs have significantly dropped so that it becomes commercially available on a widespread basis. Until that threshold is met, it would be technologically unrealistic and economically unacceptable to require the widespread installation of carbon capture equipment. The use of deep saline geologic formations as the primary long-term geologic formations for CO_2 storage has not yet been sufficiently demonstrated. There are no national standards for permitting such storage reservoirs; there are no widely accepted monitoring protocols. Underscoring these realities, industrial insurance companies point to a lack of scientific data on CO_2 storage as one reason they are disinclined to insure early projects. In a nutshell, the institutional infrastructure to support CO_2 storage does not yet exist and will require years to develop. In addition, application of today's CO_2 capture technology would significantly increase the cost of an IGCC plant, calling into serious question regulatory approval for the costs of such a plant by state regulators. Further, recent studies sponsored by the Electric Power Research Institute (EPRI) suggest that application of today's CO_2 capture technology would increase the cost of an IGCC plant by 20 to 50 percent, and boost the cost of a conventional pulverized coal plant by up to 75 percent, which would again jeopardize state regulatory approval for the costs of such plants.

Despite these uncertainties, I believe that we must aggressively explore the viability of this technology in several first-of-a-kind commercial projects. AEP is committed to help lead the way, and to show how this can be done. For example, as described earlier in this testimony, AEP will install carbon capture controls on two existing coal-fired power plants, the first commercial use of this technology, as part of our comprehensive strategy to reduce, avoid or offset GHG emissions.

AEP is also building two state-of-the-art advanced ultra-supercritical power plants in Oklahoma and Arkansas. These will be the first of the new generation of ultra-supercritical plants in the U.S.

AEP is also advancing the development of IGCC technology. IGCC represents a major breakthrough in our work to improve the environmental performance of coal-based electric power generation. AEP is in the process of designing and constructing several of the earliest commercial scale IGCC plants in the nation.

IGCC technology integrates two proven processes – coal gasification and combined cycle power generation – to convert coal into electricity far more efficiently and cleanly than any existing power plants can. Not only is it cleaner and more efficient than today's power plants, but IGCC can also be retrofitted in the future for carbon capture at a lower capital cost and with less of an energy penalty than traditional power plant technologies, but only when the technology has been proven.

AEP is also a founding member of FutureGen, a groundbreaking public-private collaboration that aims squarely at making near-zero-emissions coal-based energy a reality. FutureGen is a $1 billion, 10-year research and demonstration project. It is on track to create the world's first coal-fueled, near-zero emission electricity and hydrogen plant with the capability to capture and sequester at least 90 percent of its carbon dioxide emissions.

As an R&D plant, FutureGen will stretch -- and indeed create -- the technology envelope. Within the context of our fight to combat global climate change, FutureGen has a truly profound mission – to validate the cost and performance baselines of a fully integrated, near zero-emission coal-fueled power plant.

The design of the FutureGen plant is already underway, and we are making great progress. The plant will be on-line early in the next decade. By the latter part of that decade, following on the advancements demonstrated by AEP, FutureGen and other projects, CCS technology should become a commercial reality.

It is then, and only then, that commercial orders will be placed on a widespread basis to implement CCS at coal-fueled power plants. That is, roughly around 2020. Widespread deployment assumes that a host of other important issues have been resolved, and there is governmental and public acceptance of CCS as the proven and safe technology that we now believe it to be. AEP supports rapid action on climate change including the enactment of well thought-out and achievable legislation so that our nation can get started on dealing with climate change. However, the complete transformation of the U.S. electricity system will take time, and we can't put policy ahead of the availability of cost-effective technology. The development of technology must coincide with any increase in the stringency of the program.

What will happen if the Congress does the opposite, and mandates deep reductions in the absence of a proven, viable technology? It is the proverbial road of good intentions, and only dangerous consequences can follow. The most immediate would be a dramatic -- and very likely costly -- increase in the use and price of natural gas by the utility sector, since there would be no other identifiable alternative. This would have significant adverse impacts on consumers and workers by driving up the cost of gas for home heating and cooking, and would further increase costs

to any industry dependent upon natural gas as a feedstock, such as chemicals and agriculture with a further exporting of jobs overseas.

A huge challenge that our society faces over the remainder of this century is how we will reduce the release of GHG emissions from fossil fuels. This will require nothing less than the complete reengineering of the entire global energy system over the next century. The magnitude of this task is comparable to the industrial revolution, but for this revolution to be successful, it must stimulate new technologies and new behaviors in all major sectors of the economy. The benefits of projects like FutureGen will apply to all countries blessed with an abundance of coal, not only the United States, but also nations like China and India.

In the end, the only sure path to stabilizing GHG concentrations over the long term is through the development and utilization of advanced technologies. And we must do more than simply call for it. Our nation must prepare, inspire, guide, and support our citizens and the very best and the brightest of our engineers and scientists; private industry must step up and start to construct the first commercial plants; and our country must devote adequate financial and technological resources to this enormous challenge. AEP is committed to being a part of this important process, and to helping you achieve the best outcome at the most reasonable cost and timelines possible. Thank you again for this opportunity to share these views with you.

Jackson (Jack) Reasor
President and Chief Executive Officer
Old Dominion Electric Cooperative
Glen Allen, Virginia

Testimony
Before the Subcommittee on Energy and Air Quality
Committee on Energy and Commerce
United States House of Representatives

Hearing on:
Climate Change: Perspectives of Utility CEOs
March 20, 2007

SUMMARY

ODEC is a wholesale electric supplier to 12 distribution cooperatives which own ODEC. We generate electricity from a diversified fuel mix, including coal, nuclear, gas, oil, and renewable sources. The distribution co-ops we serve have developed demand management programs that can shave 10 percent off our annual peak. Even with that demand management, our growth will require additional base load generation soon. Under all realistic analyses, coal will continue to be needed to meet base load electricity needs, indicating the need to develop new technologies in the face of climate change concerns.

There are three critical points for this Subcommittee to consider when developing climate change legislation:

First, developing and commercializing new technologies (including advanced generation technologies and carbon capture and storage technologies) will be critical for the utility sector to reduce greenhouse gas emissions. We urge the Subcommittee to only consider legislation that ties any reduction requirements and associated timelines to the commercial availability of cost-effective technology to achieve any reductions. Additionally, adequate funding must be provided for the research, development, demonstration, and commercialization of these new technologies.

Second, Congress must provide incentives to deploy those new, riskier technologies, and we urge the Subcommittee to include appropriate incentives for not-for-profit cooperative utilities to help protect cooperative member-consumers from the higher cost and risk from new technologies. Cooperatives are least capable of financing newer, riskier technologies, and appropriate incentives will allow us to play a more substantial role under any climate change program. Additionally, appropriate incentives will help protect rural electric

member-consumers from the higher costs of these new technologies, since our member-consumers are among those least able to afford higher energy prices.

Third, if the Subcommittee develops cap-and-trade legislation, there are several design elements that we would want to work with you to develop. One of the most critical is how to allocate emissions allowances. We believe that allowances must be allocated, not auctioned, and they must be allocated to fossil-fuel based units. Non-emitting units should not be allocated emissions allowances. I say this as an owner of both fossil-fuel based generation units and non-emitting nuclear power. Providing allowances to only emitting units helps to minimize electric generation costs and reduce the higher prices placed on the nation's electric consumers. Providing allowances to non-emitting sources would only drive up the cost of electricity for consumers without providing any additional environmental benefit.

Electric cooperatives nationwide provide power to some of the most rural, and some of the poorest, areas of the country. Cooperative service territory averages 7 consumers per mile of distribution lines, compared to 35 for investor-owned utilities and 46 for municipal utilities. Nearly 400 distribution electric cooperatives serve areas with poverty rates above the national average and over 2/3 of electric cooperatives have residential rates higher than the neighboring investor-owned utility. In addition, the average household income and per capita income of cooperative member-consumers is below the national average by 16.2 percent and 15.3 percent respectively.

On average, generation cooperatives (G&Ts) have equity ratios of approximately 18 percent, with many G&T equity ratios in the 5 to 10 percent range meaning that few, if any, G&Ts have the financial ability to invest in newer, riskier, more unproven technologies. Currently coal accounts for 80 percent of the electricity generated by co-ops. We have invested in coal to provide our member-consumers with the most reliable and affordable electric energy possible.

INTRODUCTION

Good Morning Mr. Chairman and members of the Subcommittee. My name is Jack Reasor, and I am President and Chief Executive Officer of Old Dominion Electric Cooperative in Glen Allen, Virginia. It is a pleasure to appear before you today to present some of our views on the issue of climate change. I deeply appreciate the invitation being extended to me as a representative of the electric cooperative sector of the utility industry.

At the outset, I need to emphasize three critical points that I will discuss further from the cooperative segment of the utility sector for this Subcommittee to consider as you develop climate change legislation.

> First, developing and commercializing new technologies (including advanced generation technologies and carbon capture and storage technologies) will be critical for the utility sector to reduce greenhouse gas emissions. We urge the Subcommittee to only consider legislation that ties any reduction requirements and associated timeline to the commercial availability of cost-effective technology to achieve any reductions. Additionally, adequate funding must be provided for the research, development, demonstration, and commercialization of these new technologies.
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these new technologies, and our member-consumers are among those least able to afford higher energy prices.

Third, if the Subcommittee develops cap-and-trade legislation, there are several critical design elements to that policy that we would want to work with you to develop. One of the most critical is how to allocate emissions allowances. We believe that allowances must be allocated, not auctioned, to utilities, and they must be allocated to fossil-fuel based units. Non-emitting units should not be allocated emissions allowances. I say this as an owner of both fossil-fuel based generation units and non-emitting nuclear power. Providing allowances to only emitting units helps to minimize electric generation costs and reduce to higher prices placed on the nation's electric consumers. Providing allowances to non-emitting sources would only drive up the cost of electricity for consumers without providing any additional environmental benefit.

OVERVIEW OF OLD DOMINION ELECTRIC COOPERATIVE

Old Dominion Electric Cooperative (ODEC) generates electricity at wholesale and supplies electricity to twelve distribution cooperatives located in Virginia, Maryland, and Delaware. ODEC is owned by these distribution cooperatives (co-ops), which provide electricity to over half a million customers and cover one-third of the land mass of Virginia and 80 percent of the Delmarva Peninsula.

While ODEC supplies wholesale electricity to communities in Virginia experiencing large residential and commercial growth, ODEC continues to meet the challenge of supplying affordable, reliable electricity for resale to rural areas where population densities are low. Low population density and the fact that the ultimate consumers are our owners are two primary drivers requiring ODEC to focus on supplying wholesale electricity at affordable prices.

To satisfy existing and anticipated wholesale electricity needs, ODEC has diversified its fuel sources and uses coal, nuclear, natural gas, and oil to generate electricity. In 2005, ODEC generated over 5.5 million megawatt hours (MWh) of electricity. Additionally, ODEC purchased over 7 million MWh of electricity on the market to meet the needs of our distribution cooperatives.

ODEC also purchases 12,500 MWh of renewable energy from a landfill gas-to-energy project. We are investigating additional opportunities to develop renewable generation, but Virginia's wind, geothermal, solar, and biomass resources are limited (see attachment – Renewable availability in the US). ODEC is currently working with the Virginia Waste Solutions Forum and hopes to develop a manure digester and/or poultry litter energy project in the Shenandoah Valley. Although important to Virginia and our consumer-members, these tend to be small scale projects, and the opportunities for renewable energy development in Virginia, like much of the Southeast, are limited.

Over the past 20 years, the ODEC members have implemented a load control program achieving approximately 10 percent control of ODEC's annual peak. These programs are ongoing and will continue to reduce ODEC's future peak requirements.

OVERVIEW OF ELECTRIC COOPERATIVES GENERALLY

Electric cooperatives are very concerned that some proposals would have dramatic negative economic consequences, and we have in the past opposed poorly designed initiatives because of those economic consequences. Electric cooperatives believe strongly that any program should minimize adverse economic consequences on individuals, economic sectors, and regions of the country that may least be able to afford higher energy prices resulting from a climate change policy.

Electric cooperatives face several important economic realities that must be considered during development of any national program. For example, co-ops serve many of the poorest parts of the nation. Nearly 400 distribution electric cooperatives serve areas with poverty rates above the national average. Average household income and per capita income of cooperative member-consumers is also below the national average, by 16.2 percent and 15.3 percent respectively. Cooperatives also serve a disproportionate share, nearly twice the level of the rest of the industry, of mobile homes. Over 13 percent of cooperative consumers reside in mobile homes compared to the overall utility average of 7.3 percent.

Additionally, electric cooperative rates have been, and remain, higher than the rates of the neighboring investor-owned utility. The most recent data shows that over 2/3 of electric cooperatives have residential rates higher than the neighboring investor-owned utility, and about 3/4 of cooperatives have commercial or industrial rates higher than the neighboring investor-owned utility. [See Attached Chart – Residential Rates Compared with nearest IOUs.]

Cooperative service territory is often quite rural, and cooperatives nationwide average 7 consumers per mile of distribution lines, compared to 35 consumers per mile for investor-owned utilities and 46 consumers per mile for municipal utilities. As such, the distribution investment per customer is higher to serve those areas, while the revenue per mile of line is dramatically lower than IOU and municipal utilities. Co-ops generate about $10,500 per mile of line, while IOUs generate about $62,600 per mile of line and municipal utilities generate about $86,300 per mile of line.

Rural electric cooperatives also serve a much higher share of residential customers, and a lower share of commercial and industrial facilities compared to the rest of the industry, meaning that any increased costs for us get passed through to individuals, rather than business customers. Of total cooperative

sales, 58 percent is to residential customers, compared with 37 percent for the industry as a whole. Inversely, industrial customers make up 21 percent of all co-op sales, and commercial customers are also 21 percent of our sales. For the entire industry, 35 percent of sales are to commercial customers and 27 percent to industrial facilities.

Rural electric generating cooperatives, referred to as G&Ts are also in economic situations that make it very hard for them to invest in cutting-edge technologies. Those technologies are often riskier for lenders to begin with, and G&T equity ratios make it harder still to secure financing for anything other than proven, commercially-available technologies. On average, G&T cooperatives have equity ratios of approximately 18 percent, with many G&T equity ratios in the 5 to 10 percent range. Few, if any, G&Ts have the financial ability to invest in newer, riskier, more unproven technologies when compared to other segments of the industry.

Because coal-based generation has historically been the lowest-cost form of generation available, co-ops have invested in this generation source to provide our member consumers with reliable, affordable power. Currently coal accounts for about 80 percent of the electricity generated by co-ops nationwide, compared to about 52 percent for the electric utility industry as a whole. These investments have been made to provide our member-consumers with the most reliable and affordable electric energy possible.

All of this data indicates that a mandatory greenhouse gas reduction program will have a disproportionate impact on rural electric cooperatives and our member-consumers.

GENERAL PRINCIPLES FOR CLIMATE CHANGE LEGISLATION

As a generator of electricity, ODEC is very aware of the growing debate over how to address climate change concerns in Congress. We will be impacted significantly by various climate change proposals given our generation mix and the generation mix of the companies from which we purchase power. ODEC will be required, as a cost-based not-for-profit utility, to pass any cost increases on to our distribution cooperatives, which in turn must pass those costs through to end-use consumers. As consumer-owned and run utilities, we are deeply concerned about the potential for serious economic impacts from poorly-designed policies to address climate change.

I would like to lay out several broad principles against which any climate change policy must be evaluated. NRECA's membership will decide tomorrow, Wednesday, on principles that will guide our national association's policy as this debate moves forward, and all cooperatives look forward to working with you to craft a responsible climate change policy.

We believe any plan must cover all sectors of the economy, not simply electric generation. No single sector is responsible for the accumulation of greenhouse gases in the atmosphere, and no single sector should be solely responsible for achieving the public policy objective of eventually stabilizing the greenhouse gas concentration in the atmosphere. Additionally, a program that covers a wider scope of economic activities generally will be more economically efficient than a program targeted at only limited economic activity.

Legislation must recognize that the climate change issue is a global issue, and include provisions to encourage all major emitting nations to address their emissions. I understand that Congress cannot pass a law requiring any action from a sovereign nation, but I would urge the Subcommittee to include elements in your legislation that would put the brakes on a U.S. program if other major emitting nations are not taking suitable actions to address their emissions. We should not unilaterally disadvantage American companies and American workers

in the face of international competition if our competitors are not taking some level of responsible actions to address climate change as well.

Climate change proposals must also recognize the importance of maintaining fuel diversity, allowing a variety of fuel sources to meet the energy and economic needs of the nation. There must be a future for abundant, domestic coal under any plan, for additional nuclear generation, and for expanded use of renewable resources like wind, solar, hydro, geothermal, biomass, agricultural by-products and animal organic manure and litter and others where they are available.

Any proposal should minimize the negative economic effects of higher energy prices, and include provisions such as an economic safety valve to protect against significant economic consequences. Congress should consider the impacts on different regions and different sectors and address any disparities that may develop.

In the short term, terrestrial sequestration, conservation, and energy efficiency measures appear to offer the most cost-effective methods of mitigating greenhouse gas emissions, and those efforts should take priority and be recognized.

In the longer-term, technological advances will be critical to allowing the electric utility sector to actually reduce greenhouse gas emissions. We need to continue the important progress we have made on advanced coal generation technologies, improved efficiencies at fossil and nuclear generation facilities, new nuclear generation technologies, improving renewable energy technologies, and commercializing cost-effective carbon capture technologies.

Any plan should provide incentives to all segments of the utility industry to develop and deploy advanced electric generation, carbon-capture, transmission, and distribution technologies that improve the greenhouse gas efficiency of the

power sector. Historically tax incentives have only benefited the for-profit segment of the electric utility industry, and if cooperatives are going to be expected to be part of any greenhouse gas reduction plan, equitable incentives must be provided to co-ops as well.

Any plan should recognize that climate change policy and energy policy are inextricably linked, and that climate change policies can have a significant impact on our nation's economic and energy security. Federal policy should also pre-empt local, state, and regional mandatory programs to prevent a patchwork of regulatory approaches across the nation. Finally, any plan should remove regulatory and other impediments to increasing the efficiency of existing generating units and improving the carbon efficiency of our current resources.

EMPHASIS MUST BE PLACED ON NEW TECHNOLOGIES

As I have indicated, there must be a strong emphasis on developing and widely deploying new technologies. But these technologies must be developed in a considered manner to assure they produce the results we will most certainly pay for. We need proven technologies and an implementation plan to assure technical feasibility and cost-effective control. We should not mandate use of any particular technology to achieve these policy objectives. Based on my experience and the experiences of my fellow Generation and Transmission (G&T) CEOs, it is unlikely that such technologies will be widely commercially available for 10 to 20 years.

As I stated earlier, ODEC currently purchases over half of its energy needs in the marketplace. Our members continue to grow, and in the near future we will need more base load generation. The realistic options we have are our existing energy sources—coal, nuclear, and natural gas.

Given high natural gas prices and concerns over availability, nuclear and coal are more attractive options for base load generation. Nuclear has the advantage of being carbon-free, but nuclear waste disposal has yet to be settled and public acceptance remains an issue in some areas. That leaves coal. It is abundant, available locally, and affordable. But its carbon emissions are twice that of natural gas with conventional generation.

For those of us evaluating whether to build coal generation within the next 10 years, the issue of carbon emissions and a change in federal policy is of overriding concern. Technology is available to build plants that are more efficient than in the past. Supercritical and ultra-supercritical generation increase efficiency and reduce emission intensity 5 percent over conventional pulverized coal. On the other hand, IGCC, although promising, has yet to be demonstrated at commercial scale – 500 to 1000 MW capacities – for electric generation. Several plants are planned and will provide us with good information on reliability and environmental and economic performance. I would note that the efficiency of IGCC plants is currently comparable to advanced coal combustion and IGCC currently carries about a 20 percent cost premium compared to advanced coal.

Beyond the 5 to 10 percent gains in generation efficiency possible between now and 2015, additional reductions in carbon emissions may come from carbon capture and storage (CCS). The Subcommittee recently heard testimony from the Electric Power Research Institute on the state of CCS technology. This is also the subject of the MIT Future of Coal study released last week and of many other reports. Their conclusions are all basically the same: While CCS may be the future of coal in a carbon-constrained world; the technology is still in development.

Best case modeling scenarios suggest that CCS will add 40-50 percent to the cost of electricity for IGCC plants and an additional 30 percent above that for PC plants (for a total cost of electricity 60-80 percent higher than today) due to

energy losses to post-combustion CO2 separation and capital expenditures for the separation and capture equipment. Translated into dollars, costs are estimated at $27/ton of CO2 ($100/ton C) or 2.3 cents/kWh--a 50 percent increase in the wholesale cost of electricity. These costs exclude post-CO2 storage costs such as monitoring and liability insurance, and the CO2 will need to be transported via pipeline from the plant site to the areas that have suitable geologic storage formations. More importantly, integrated CCS technology has yet to be demonstrated on a commercial scale anywhere and federal and state governments have yet to propose a regulatory framework for CCS.

The CURC-EPRI Roadmap projects that with an aggressive RD&D program and experience installing and operating integrated systems, the costs of electric generation with CCS will come down by 2025. However, there is considerable uncertainty over cost estimates 5 years into the future, let alone 20 years. And the roadmap goals are stretch goals. They are only achievable with federal commitment, federal funding, and federal RD&D.

There is much work to be done before we'll be able to capture and store the CO2 emissions from one 500 MW coal plant (3 million tons of CO2/year). The United States currently has 300,000 MW of coal-based generation. We have much work ahead of us just on the technology side, and also have significant policy matters to address such as potential liability concerns for CO2 sequestration, transportation infrastructure for the CO2, and responsibilities for monitoring long-term storage, among others.

For a small generation cooperative, the technology choices are limited. We are too small to risk our members' money on unproven technology. We can't afford a 50-80 percent cost premium. And we can't wait until 2025 to build generation.

We will need federal assistance to address this challenge and federal policy that recognizes our need to meet a growing electricity demand and the inadequacy of current technologies to mitigate CO2 emissions on a large scale.

EQUITABLE INCENTIVES MUST BE PROVIDED

I have outlined the significant need for a technology push that will provide utilities with the tools needed to reduce carbon emissions. In addition to that significant technology push that must occur, appropriate incentives will play a very important role in making this technology available and affordable for our member-consumers. Incentives enable utilities to bring alternative generation resources on line despite their higher capital costs. Small in size with few consumers per mile, electric cooperatives can't hide high prices for generation. We operate on a not-for-profit basis, returning revenues in excess of what is needed for generation back to our member-consumers. By the same token, electric cooperatives must flow the costs of any generation to consumers through rates, and every member on our system bears those costs. Keeping rates affordable and the delivery of energy reliable is our key mission, and our locally-elected boards of directors hold us accountable to that mission.

The Energy Policy Act of 2005 recognized that incentives, particularly tax incentives, take center stage among federal polices that foster technology development. For example, EPACT extended the Production Tax Credit (PTC) that provides up to a 1.9 cent per kWh incentive for development of wind, geothermal, hydropower, biomass and other renewable resources. EPACT created an equally important new program, the Clean Renewable Energy Bond, in recognition that not-for-profit electric cooperatives, generally exempt from tax at the federal level, can not take advantage of tax credits like the PTC. The CREB program has proven to be as successful as the PTC in getting new renewable resources in the ground, as electric cooperatives alone flooded Treasury with more than $550 million in applications for 85 projects in 22 states.

EPACT also provided an investment tax credit for the development of advanced pulverized and IGCC coal technologies and a Production Tax Credit for advanced nuclear resources. Unfortunately, federally tax-exempt electric cooperative do not have an opportunity to put those incentives to use. At the same time, because their significant generating capacity is sized to keep pace with our growing communities, applying advanced coal technologies and nuclear generation resources stands to make the biggest impact on reducing carbon emissions. Today, electric cooperatives do not have the opportunity that other sectors do to invest in these technologies. Although this issue will also be considered by other committees, we would like your help to ensure that any future energy bill will include financing mechanisms that electric cooperatives can use for advanced clean goal and nuclear generation, and the PTC and CREBs programs are extended for a meaningful length of time.

ALLOWANCES MUST BE FAIRLY ALLOCATED, NOT AUCTIONED

The first environmental cap and trade program in the world began in the U.S. with 1990 Clean Air Act Acid Rain Control Program – as subject very familiar to this Subcommittee. Since then numerous other air regulatory programs have incorporated cap and trade approaches to effectively address emissions mitigations. Although these cap and trade programs are costly, in all cases they have proven to be the most cost-effective methods available to meet the environmental goals.

To date U.S. cap and trade programs have incorporated similar approaches in design. For the electric utility sector all programs distribute emissions "allowances" to "emission units" of regulated entities, with each allowance representing a portion of the total emissions cap. Usually one allowance represents one ton of emission to be controlled. In some cases small amounts of the total available allowances within the respective program are auctioned, and

recently cap and trade programs have made provisions to distribute allowances to emission units constructed after the programs have taken effect (through so-called "new unit set-asides").

Should the Congress enact a cap and trade system it should be set up in the most cost-effective manner possible to minimize costs to the nation's electric cooperative consumers. To ensure that a cap and trade program addressing electric utility greenhouse emissions (principally CO_2) is fair and can most effectively function to minimized costs while meeting program mitigation goals, a greenhouse gas cap and trade regime must incorporate several fundamental concepts.

First, any program must allocate the vast majority, if not all, of the electric utility sector's greenhouse gas allowances to greenhouse gas emitting units. It should be noted that, as existing electric utility cap and trade regimes have demonstrated, allocating emission allowances to emitting units does not effect the overall program compliance, or in other words the ability to meet whatever emissions cap is imposed. Further, allocating allowances to utility emitting units, as opposed to allocations upstream at the fuel source or downstream to electricity purchasers, maximizes the ability of the utility emitters to make the most cost-effective decisions to provide the most affordable electric generation, while meeting the emissions cap.

Specifically, allocating allowances to emitting units reduces compliance costs for cooperative consumers who purchase electricity from cost-based cooperative electric generators and distributors. This is necessarily so simply because under any cap and trade program, the emissions placed under the cap are valued with the dollar amount determined by the stringency of the cap. Owners and operators of emitting units under a cap have several options available with allowances allocated to their units. These options are not mutually exclusive and

all result in cost savings to consumers who purchase electricity from not-for-profit cooperatives that is priced according to cost to generate and distribute it.

Cooperative generators can use allowances to cover all or a portion of a unit's emissions, thus reducing the cost of electricity compared to the alternative of requiring generators to buy all needed allowances at market-based or auction prices. In other words, auctions will drive up electricity prices unnecessarily to rural electric cooperative member-consumers. Alternatively, where it is more cost-effective to do so, generators with allowances could sell those allowances to generate proceeds to help cover more expensive electricity purchased from low- or non-emitting units in lieu of using allowances to cover their emissions. This flexibility can be crucial to fossil-fuel based electricity generators, and ultimately our member-consumers.

The second fundamental concept that any cap and trade program must incorporate is an equitable allowance distribution among electric utility emitting units. Generally speaking, the higher the unit's historical greenhouse gas (CO_2) emissions the more costly the utility's options will be to meet cap compliance obligations and to supply substitute generation. Therefore, following some more recent regulatory cap and trade programs, the most equitable method would be to allocate allowances based on each unit's recent historical CO_2 emissions as a percentage of all utility emissions over the same time period. All fossil fuel utility units should receive allocations based on this general concept.

Also, some of the more recent clean air cap and trade programs have set aside emission allowances for new units constructed after the cap takes effect. I believe such an approach for a greenhouse gas cap and trade program is fair and equitable because as a practical matter, there is no commercialized fossil-fuel based-load generation where carbon capture and storage is available let alone reasonably priced. This is certainly a technology area that holds great promise, but presently such technology simply is not ready for prime time, and

until it is, significant new base load generation will be fossil fuel based and will emit CO_2.

To equitably address CO_2 emissions of new units constructed after the cap, I believe a new unit set-aside should be an integral part of any greenhouse gas cap and trade regime. This could be done in several ways, such as setting aside a small portion of allowances for new units out of the total allowances for all utility fossil fuel units. After a several year period of new unit's operation, each new unit could be allocated allowances under the basic formula for units existing before cap implementation and a new set-aside for future new units could be established.

CONCLUSION

Thank you Mr. Chairman for affording me the opportunity to testify as a not-for-profit, consumer-owned cooperative utility. I would be happy to answer any questions you or other members of the Subcommittee may have and look forward to working with you as you undertake the very daunting task of developing climate change legislation.

TESTIMONY OF JAMES E. ROGERS
CHAIRMAN, PRESIDENT AND CEO
DUKE ENERGY CORPORATION

BEFORE

HOUSE SUBCOMMITTEE
ON
ENERGY AND AIR QUALITY
ENERGY AND COMMERCE COMMITTEE
MARCH 20, 2007

Chairman Boucher and members of the subcommittee, I would like to thank you for inviting me to share my thoughts this morning on how Congress can balance the need to protect our climate with the necessity of continuing to use one of our nation's most important natural resources – coal.

My name is Jim Rogers and I am Chairman, President and Chief Executive Officer of Duke Energy Corporation, one of the nation's largest generators of electricity. Duke Energy is headquartered in Charlotte, North Carolina, serving nearly four million customers in five states. In just 14 days, we will be celebrating the first anniversary of the Duke-Cinergy merger which brought together two strong companies – one in the Southeast and the other in the Midwest – with outstanding customer service and top-flight operational skills.

The new Duke Energy now owns nearly 37,000 megawatts in U.S. generating capacity with about half of that capacity coming from coal-fired power plants. More importantly

perhaps than capacity, is that in 2006, Duke Energy produced nearly 150 million megawatts-hours of electricity with 71 percent of it dispatched from coal units. Our customers expect and our regulators require us to dispatch the least-cost available power and that almost always means coal.

We are mindful that our reliance on coal brings with it a responsibility to address the environmental footprint it leaves. It is that commitment that brings me to your hearing today.

Some have questioned how, as the third largest consumer of coal, I could be so outspoken on the need to address climate change through legislation. At this point, I view the science as having resolved two important questions: The earth is warming and human activities are contributing. The scientific debate has now moved to questions of timing and ultimate impact. In any event, it is my judgment that we need to act now to begin reducing our carbon footprint.

I am confident that Congress can structure climate legislation in a way that protects our economy and our long-term outlook for coal, advances technology and leaves our environment in a better place for our grandchildren. Congress can and should structure legislation in a manner that promotes innovation, is creative in its ability to encourage investment in new and emerging technologies and fairly distributes the costs that will be necessary to achieve environmental improvement.

The success we achieved through a market approach in the Clean Air Act Amendments of 1990 demonstrated that a clean environment and a healthy economy are not mutually exclusive. It took political courage to eschew the traditional command-and-control regulatory system and create a flexible cap-and-trade system with tradable allowances. But, Congress recognized the power of the marketplace and the requirement that utilities seek the least-cost option to comply and created a program that led to cleaner air at a much lower cost for consumers.

There are other lessons from those days that are instructive as we move forward to regulate greenhouse gases.

First, while Congress recognized that it was in the national interest to significantly reduce sulfur dioxide emissions from coal-fired power plants, it realized utilities needed time to comply. Congress responded by creating a two-phase program with the first phase starting five years after enactment and the second five years after that. This allowed utilities time to create a compliance plan, move it through their state regulatory process, finance it and install the necessary equipment. The phased approach also prevented customers from being hit with sudden electricity rate increases.

Second, Congress addressed the regional challenges that the Clean Air Act posed to those areas of our country that rely most on coal as the primary fuel to generate electricity. Through its design of the emissions allowance system, Congress ensured allocations went to generating facilities and their customers that needed them, based on fuel input. These

ensured regions such as the Midwest, Southeast and the Plains states did not suffer a disproportionate economic impact. These same regional disparities exist today and should be addressed in a similar manner in greenhouse gas legislation.

Third, and critical to today's hearing, Congress recognized the need to maintain fuel diversity and the economic viability of America's coal-generating fleet. Then, as now, the key to coal's viability in an ever-changing regulatory environment, is technology. The market, federal incentives and time --- all were important then and even more so now in crafting a national greenhouse gas strategy that ensures our ability to use the more than 200 years of domestic coal that remains unmined.

As the nation's third largest utility emitter of greenhouse gas emissions, I am engaged in this debate about climate because I believe that those who stand to be most affected and most at risk must be involved to help shape an outcome that achieves environmental benefits while protecting our customers from economic harm.

Encouraging and funding innovation

As the door opens to what will become a carbon-constrained economy, we face a clear challenge that must be overcome. Unlike the days preceding passage of the Clean Air Act, we have no obvious technological solutions that are available today to scrub carbon out of the flue gas. There are promising new technologies being researched and

developed, but right now there is no machine that we can add to the back or front end of our coal plants that will eliminate carbon dioxide emissions.

We do have existing products that can be pulled off the shelf such as compact fluorescent light bulbs, energy star refrigerators, home insulation and hybrid vehicles if the right economic or regulatory incentives are put into place. A market-based approach like a cap and trade program can change the relative competitiveness of the various choices faced in consumption and investment. High-emitting energy sources or uses will become less desirable compared to low-emitting choices. The changing market conditions will put more of these products into consumers' hands.

However, the carbon price signal that the market will create is not enough to fund large scale demonstration of "near ready" technologies, much less the development of longer term next generation technologies that will be required in the latter half of the century.

Tax incentives are an important component of the technology solution, and Duke is excited to have received a $130 million investment tax credit to help build an integrated gasification combined cycle (IGCC) plant in Edwardsport, Indiana. IGCC is a promising technology that needs wider utility-scale demonstration. Congress rightly recognized this by authorizing investment tax credits in the Energy Policy Act of 2005, acknowledging a public-private sector partnership was needed to move this technology forward more quickly.

I encourage Congress to closely review the long-term funding programs that help promote the development of IGCC and other advanced coal technologies. You should determine where research programs can be combined and efficiencies gained and look for creative ways to further reduce risk taken on by utilities that are building new or emerging technologies.

Carbon sequestration

Carbon capture and storage (CCS) from coal-fired power plants is a near-ready technology that is critical if we are to achieve our environmental goals while continuing to preserve the fuel diversity that is so important to our economy. CCS takes the CO_2 captured from the power plant and channels it underground for permanent storage in deep geological formations. But, this storage capacity is not available everywhere. And, contrary to some statements I've seen recently, this technology is not fully developed and ready for deployment.

We believe CCS will prove to be one of the least cost ways to reduce CO_2. Duke Energy's commitment to CCS includes membership in three DOE-funded carbon sequestration consortia and a project this summer that will inject a large quantity of carbon dioxide deep into the ground at our East Bend, Kentucky power plant. The National Energy Technology Laboratory (NETL) in DOE's Office of Fossil Energy manages these and four other consortia, creating a nationwide network to help identify

the best technologies, regulations and infrastructure needed for carbon capture and storage.

These partnerships will house multiple small scale projects that will provide invaluable information on siting, monitoring, evaluation and public acceptability of carbon sequestration. Public acceptability includes legal and liability issues which must be settled before any company would feel comfortable moving forward with a large-scale CCS project.

Even before carbon can be sequestered, it first has to be captured – a technology still in its infancy when applied to utility operations. Current technology, if one were to install it in a 600-megawatt supercritical plant, would consume about 174 megawatts of capacity and, on an IGCC facility, about 78 megawatts. Clearly, we need considerable work to reduce those requirements.

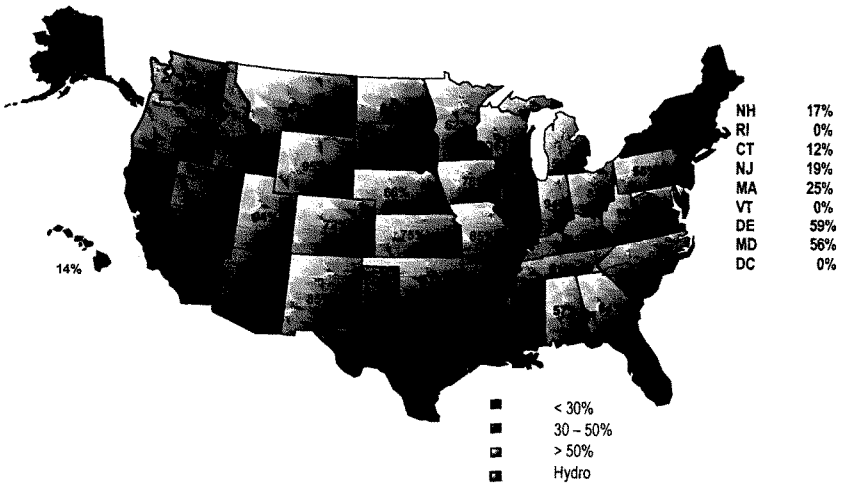
Congressman Boucher, I understand that you have been exploring ways to help offset the cost of carbon sequestration for industries pursuing coal to liquid technology. I believe that such incentives should be expanded to utilities or industry that takes on the role of capturing and sequestering carbon from coal fired power plants. Again, reducing the risk helps to advance technology. Congress can and should continue to play a major role in ensuring proper financial support for developing technologies that can lead to the successful utility-scale capture and storage of greenhouse gas emissions.

Technologies for the current coal fleet

There are more than 1,500 pulverized coal units in the U.S. today, providing just under 336 gigawatts of generating capacity to consumers in 47 states. Clearly, technologies must be developed to mitigate carbon emissions from these facilities, many of whom have many useful years of life left. We need as strong a commitment to these plants as we do to the shiny new ones we anticipate building. In my view, it is risky to place your bets on just one technology, which is why I believe we need to develop the carbon emissions technology to keep these plants operating.

Percent of Total Generation from Coal (2005)

National Average: Coal Share of Total Generation = 50%



Source: Energy Information Administration, November 2006.

Energy efficiency

In addition, I recently testified before the Senate Energy Committee on the need for a restructured look at the way we view energy efficiency. At Duke Energy, we call energy efficiency the "fifth fuel". Most state regulatory regimes include inherent disincentives for energy efficiency efforts. We're working to change that paradigm by encouraging regulators to allow utilities to earn the same amount for saving a watt as they would for generating a watt. Taking variable costs such as fuel and emission costs into account, the save-a-watt model we are proposing produces a triple win for customers, companies and the environment.

While state public service commissions must take the lead, Congress can encourage states to review ratemaking practices as they relate to energy efficiency and methods of keeping the utility indifferent to building plants or saving electricity. I encourage you to include such considerations in any climate legislation.

An economy-wide market driven solution

In addition to advancing technology, I believe a comprehensive, economy-wide greenhouse gas cap and trade program is the right approach. The time to act is now because the sooner we get started, the more likely we can establish a less expensive program that starts gradually and becomes more aggressive over time.

It is essential that a carbon price signal be established through a national economy-wide cap. We have already seen bills introduced that apply only to the utility industry. These bills address only a third of U.S. greenhouse gas emissions and suggest a one-toe-in, one-toe-out policy ambivalence that is less environmentally effective. An economy-wide approach would produce a more vibrant carbon market, encouraging more innovation and sounder economic choices – all good for the consumer.

A single CO_2 price would unleash the power of the market to address this issue across all economic sectors. A defined national limit of greenhouse gas emissions creates the supply and an assigned allowance for each ton of carbon emitted creates the demand. Together, they create a carbon price that will become a factor in our investment decisions, and emissions will decline as the most cost-effective strategies are selected.

Long-term solutions better than quick fixes

It is important that Congress pay close attention to the emissions trajectories proposed in the various climate bills that have already been introduced. While we are anxious to get started now, we are very concerned that some bills propose steep reductions immediately, apparently disregarding what is technically possible and the impacts on electricity prices.

The reduction of greenhouse gas emissions should be considered a decades-long commitment. We have a carbon-based economy today and, to attempt to suddenly decarbonize it, would result in severe economic repercussions.

We advocate first slowing the growth of emissions, halting their growth and then beginning absolute reductions. Abrupt reductions would require abrupt solutions such as turning quickly to lower-carbon intensive fuels which would not only increase the cost of electricity but also cause serious damage to the coal industry.

The ripple-effects throughout the economy would be unacceptable and, in my view, unnecessary. We need to address this problem wisely, priming the economy by starting with some prudent reductions now but waiting until the technology is ready to make the big changes that must come.

It is critical that Congress align the reduction path it charts with the technological realities that exist. While I am very optimistic that American ingenuity and enterprise will rise to the task with innovations that maintain the viability of our coal fleet, I urge Congress to periodically examine the state of the technology and determine if that balance has been maintained. If the technology development were to lag and the reductions path no longer realistic, you need the flexibility that allows you to appropriately adjust the policy. Legislation needs to specifically require a periodic technology review and a reset provision so you have the option to continually oversee this evolution to a decarbonized economy.

Allowance allocations key to fairness

The allocation of emission allowances and the policies Congress set in crafting a greenhouse gas bill will have a profound effect on how certain regions of the country are able to absorb costs.

Congress recognized this back in 1990 and took responsibility for making policy decisions that were successful in reducing emissions and saving the coal-based regional economies. You face that same decision again although, this time, the stakes are even higher.

The decision on how to allocate allowances is strictly an economic one. It does not impact the cap and emissions trajectories you choose – it affects the ability of those most impacted to pay for those choices. Emission levels will be the same under any allocation scheme, set by the cap. You decided, back in 1990, to use those allowances to provide a soft landing for those regions disproportionately impacted by the new sulfur dioxide policy. Distributing the majority of allowances to coal-fired generation was a fair decision then and a fair one now.

Allocations should, first and foremost, be distributed on the basis of recent fuel-adjusted heat input, providing allocations where they are needed – not to generators who emit no greenhouse gases. This allocation method mitigates rate and other cost shocks that otherwise would be felt by the state and regional economies that will bear the lion's share

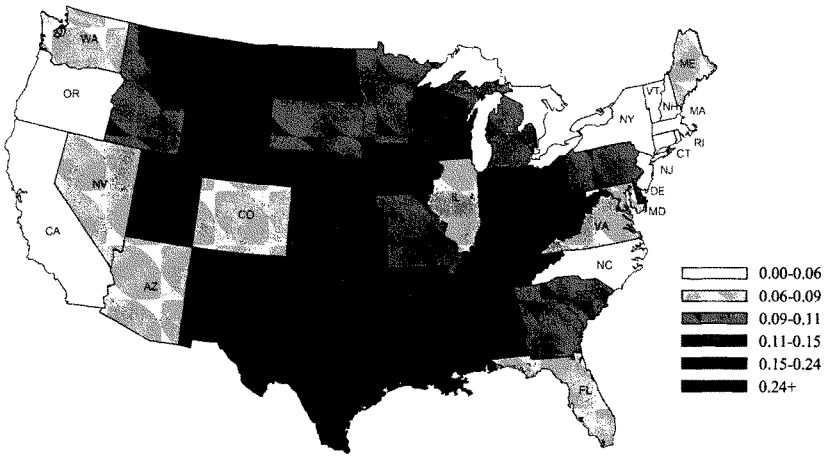
of the costs. The allocations won't enrich companies like Duke Energy; instead the benefit will flow directly to our customers and prevent unacceptably high rate increases.

Conversely, allocating free allowances to non-emitting generation would constitute a windfall gain for those generating assets that would already be benefited under carbon regulation. This so-called "output based" allocation formula would be simply a wealth transfer between fuels and regions and should be rejected, as it has been continually by Congress and the EPA, as unsound public policy.

Arguments that output-based allocations will encourage the deployment of non-emitting generation are without merit. What we're talking about here is the generation on the ground – assets serving our nation's electric needs based, powered by fuels that made the most economic sense depending on location and availability. In the future, new non-emitting technologies will be deployed because the changed regulatory environment and rising carbon price signal will make them the most economic choices, regardless of how Congress assigns allocations to existing units.

Input-based allocations will help those states and customers most vulnerable to the legislation's program costs. These carbon-intensive states are notably the home of most U.S. manufacturing and agriculture interests.

Carbon Intensity of Economic Output, Commercial and Industrial Sectors, 2001
(Metric tons carbon per thousand $2005)



Source: Abt. Associates (forthcoming), Carbon Emissions Economic Intensity Index: Development and Technical Enhancements, prepared for Climate Protection Division, U.S. Environmental Protection Agency: Washington, D.C.

It is our view that particularly in the early stages of the program, a higher percentage of allowances should be allocated to utilities with a smaller percentage set aside for auction. Congress should be mindful to try and keep the value of the nation's generating assets intact as much as possible, which a higher allowance allocation will facilitate. We do support a limited auction of allowances whose proceeds we envision being used for research and development of new coal technologies, compensation to disproportionately affected industries and communities that suffer lost value and low-income assistance.

We believe allowance allocations for utilities should be locked in for a period of time and then phased out gradually to full auction. Again, this is an economic policy – not an

environmental one. The cap will continue to fall and so will utility emissions meaning the environmental goals will continue to be met.

I have already mentioned the importance of protecting coal-intensive areas of the country with an appropriately designed cap and trade system. Clearly, those regions, their utilities and customers will be required to make the largest share of reductions. This may mean closing some generating plants and altering the technology choices on others as well as spending substantial sums on energy efficiency and clean generating sources.

Utilities in states where there is less of a coal presence, conversely, will be required to do much less and, so, will have to spend much less. Awarding allowances to these generators at the expense of those generators who need those allowances would be nothing more than a wealth transfer with those customers in coal regions paying twice – once to pay either for new generation or new technology and, second, to pay for the allowances sold by utilities who didn't need them to those who did. Such a policy would not change the cap - it just makes meeting the cap and making additional reductions more expensive.

Cost Control Mechanism

Finally I would encourage Congress to consider additional ways to shield the economy from unacceptably high prices and unexpected transient price spikes which we've seen from time to time in the sulfur dioxide market.

A safety valve is well suited to provide this additional protection. This mechanism would make additional allowances available to the market at a predetermined price. It raises the emissions cap temporarily but it also protects consumers from unacceptably high costs.

Environmentalists may argue that the safety valve violates the integrity of the emissions reduction program. But remember – the real objective of reducing greenhouse gases is not the short-term reduction goals, but the long-term concentration of CO_2. Especially in the program's early years, where reductions are only somewhat less than they'd be in a business as usual world, long-term concentrations are little impacted. Those emissions reductions that are not met in the program's early years can be more inexpensively achieved in later years because of the improvement in technology.

Finally, some have expressed concern that a safety valve program would prevent linkage of the U.S. program to a wider carbon market. It is true that, if the safety valve is deployed and the U.S. releases more allowances into the market, that we will not be able to sell our allowances into a higher priced market like Europe.

But we lose nothing in this bargain because selling into Europe would only drive our CO_2 prices higher, while lowering those in Europe. Nothing about the safety valve would prevent us, however, from buying lower-priced offsets or allowances from other countries. In the longer term, we do want to link with all markets globally, but for the time being, there is little to be lost by missing opportunities to sell to Europe.

If opponents are correct in their claim that offsets or energy efficiency will ameliorate the costs of an aggressive reduction program, then the safety valve will never deploy. But if they are wrong, the American consumer will still be protected.

The safety valve should be only temporary. While it should be low enough to protect the economy, it should escalate steeply enough so as to ensure clean coal technologies, including CCS, are not held up. It is in the interest of the coal industry and of the coal-burning utilities to ensure rising carbon prices push us quickly to CCS and other technologies that can address carbon emissions from existing facilities.

Comprehensive solutions needed

In preparing our company to operate successfully under carbon caps, we've come to realize that there is no-one-size-fits-all approach to reducing greenhouse gas emissions. It will take a suite of actions to lighten our nation's carbon footprint. As I've often said, "there is no silver bullet – just silver buckshot".

In addition to advanced coal, we need a full range of renewables – wind, solar, biomass, hydro, geothermal and biogas. We need a new commitment to nuclear energy. I firmly believe we don't get where we need to be without building a new generation of zero-emission nuclear plants. And, importantly, we need to promote energy efficiency by

making fundamental changes in our regulatory regime so as to treat saved energy the same as produced energy.

Congress has a unique opportunity and significant obligations to fulfill in dealing with the carbon issue. You have a blank slate to set this country on a course of technological innovation along with substantial environmental protections. You also have the ability to adopt creative methods of encouraging the discovery and development of new technologies, allowing us to move much faster from the lab to ground breaking ceremonies.

I am encouraged that this Committee has begun a thorough examination of this critical issue and hope that you do so with the diligence that is necessary and within an appropriate timeframe that our environment deserves. I thank you for the opportunity to share my views and look forward to working with you.

Testimony of David L. Sokol, Chairman and CEO
MidAmerican Energy Holdings Company
Subcommittee on Energy and Air Quality, Committee on Energy and Commerce
U.S. House of Representatives
March 20, 2007

Thank you, Mr. Chairman. My name is David Sokol. I am chairman and CEO of MidAmerican Energy Holdings Company, an electric and gas utility company with energy assets in twenty states and around the world. Our generating mix is highly diverse, with one of the largest renewable energy portfolios in the country, including hydroelectric, geothermal, wind, biogas and biomass. In addition, we own or operate coal, nuclear and natural gas-fired assets.

At MidAmerican, one of our core principles is environmental respect. As part of our commitment to the environment, we have worked to reduce our carbon intensity by nine percent since 2000. We have done this through a combination of operational improvements, efficiency upgrades and investments in renewable energy. In the last five years, we have added almost 1,000 megawatts of new renewables to the combined systems of our two utility affiliates, and we expect to add as much as 2000 megawatts more by 2015.

I commend you for holding the series of vigorous hearings that you and Chairman Dingell have scheduled. At MidAmerican, we believe it is our responsibility to work with policymakers and regulators to ensure that you – and they – have the best information available regarding climate change.

No one should underestimate the challenge of developing a plan to transition away from the carbon emissions-intensive industrial economy that has fueled more than two centuries of economic growth and development. Responding to arbitrary timelines with ill-conceived solutions will produce either political gridlock or bad public policy – which our country cannot afford. Consumers, particularly lower income Americans who spend a disproportionately large percentage of their incomes on energy, will ultimately bear the costs of making this dramatic transformation. These costs include paying higher energy prices as well as potential job losses if carbon-intensive industry relocates overseas. The timelines you adopt for implementing changes will be the most important factors determining the economic and social costs of any climate policy.

The Science of Climate Change

There is a great challenge in attempting to discuss the scientific basis of climate change and its potential impact on the planet. The topic is too big and too complex for anyone to claim perfect information, particularly at this point in time. It seems to me that some general findings are becoming more clear, most specifically that the climate is warming and that human beings are contributing to this warming through the burning of fossil fuels.

However, as we attempt to move beyond this level of information to forecasting future impacts, there is far more uncertainty than certainty. We simply don't know how much warming there will be or how much sea levels are likely to increase.

A tremendous amount depends on factors that scientists have admitted we do not have reliable modeling tools to predict at this time, such as how clouds react under different scenarios and the role of aerosols. In general, the range of scientific opinion on the impacts of climate change has narrowed significantly in the last five years. Nonetheless, that range still stretches from relatively modest impacts to long-term, fundamental alterations.

We also need to be careful to separate scientific consensus from speculation as we attempt to form public policy. I do not believe the best climate science supports the notion that every isolated weather event is an unprecedented manifestation of human-induced climate change. The climate has always been dynamic, and mankind has always suffered from the extreme forces of nature. However, human beings also survive and thrive in an incredibly diverse range of climates. Given that every dollar spent on reducing greenhouse gas emissions and avoiding potential impacts of future climate change is one less dollar that can be invested in education or disease eradication or even other environmental programs that directly protect human health, we must weigh risks and benefits carefully and spend our resources prudently.

Looking at the range of potential climate changes we are facing, the balance of evidence supports the need for actions to minimize the risk of worst-case scenarios. Recognizing that there are broad ranges of opinion among the public, on this committee, and in the Congress on the risks of climate change, I would suggest that everyone may be able to

agree on the prudence of developing a long-term plan to minimize the potential of extreme climate disruptions over the next century. The primary focus should be on achieving sustainable global emissions levels in the longer term, rather than immediate and dramatic U.S. reductions. Put another way, the level of U.S. greenhouse gas emissions in 2012 is less important than the level of global greenhouse gas emissions in 2050.

The Importance of Developing a Template for Developing Countries

Recognizing the role of developing countries in curbing greenhouse gas emissions is not a justification for inaction. The United States' share of global emissions will decline rapidly over the next several decades. For example, according to the International Energy Agency's World Energy Outlook 2006, China and India will account for almost four-fifths of the incremental increase in coal consumption worldwide through 2030.[1] In a recent column in the New York Times, Gregg Easterbrook of the Brookings Institute noted that by 2050 under current trends developing countries will emit twice as much carbon as the United States and Western Europe combined.[2] Noting this is not intended as a criticism of China, India and the other developing nations. Overall, their recent economic development successes have lifted hundreds of millions of people out of dire poverty. In many ways we should hope their success is replicated in other developing nations throughout the world. We must recognize, however, that if we hope to some day look back on a 21st century African economic miracle or see Latin America reach its full

[1] World Energy Outlook 2006, International Energy Agency, Summary and Conclusions, p.2.
[2] "Al Gore's Outsourcing Solution," by Gregg Easterbrook, New York Times op-ed contributor, March 9, 2007.

potential, the developing nation challenge will become even more acute. In crafting climate change policy for the United States, these facts must be at the forefront of our thinking. We should strive to develop a policy that does not economically disadvantage American workers and businesses in the near term while creating a template that can be integrated into a long-term global system and replicated in the developing world.

Avoid Picking Economic Winners and Losers

You must also seek to impose this new system in a way that does not disproportionately burden any sector of the economy or consumers in any region of the country. I believe that the greatest potential for success lies in developing legislation that does not attempt to pick winners or losers. The decisions made over many decades that determined fuel mix were economically rational and in virtually all cases approved by regulatory authorities. We've made tremendous environmental progress in this country over the last half-century, but greenhouse gases have not been recognized as an environmental priority until recently. Since 1970, Gross Domestic Product (GDP) has increased 165 percent while cumulative emissions of the six primary criteria pollutants have declined by more than 53 percent.[3]

Many do not know that this historic progress in improving public health and the environment has required modest increases in CO2 emissions because of the energy lost by running our emissions control systems. This is just one example, but I believe it

[3] "Air Emissions Trends – Continued Progress Through 2005," The United States Environmental Protection Agency, October 3, 2006.

demonstrates that the utility sector has done the work necessary to meet the challenges asked of it. It's simply not constructive to attempt to retroactively punish or unjustly reward companies for the carbon intensity of their fuel mixes. Passing climate change legislation will be an enormous challenge, and the most likely path to consensus lies in avoiding punitive or unfair legislation.

Applying the Tools of Business Management to the Climate Debate

In general, we have been disappointed by the debate to date in Congress. There has been far too much focus on the enforcement system and far too little attention paid to developing the tools necessary to actually achieve reductions. At MidAmerican, we approach our key challenges through a multi-stage process whose primary components are – assess, plan, execute, measure and adjust. Applying these same tools to the challenge of dealing with greenhouse gas emissions and climate change, we recommend a multi-phased, economy-wide approach that matches emissions reduction goals to reasonable expectations of technology development.

Our recommendation is based primarily on concepts developed by the Electric Power Research Institute (EPRI) in their recently released presentation "Electricity Technology in a Carbon-Constrained Future." In that document, which I strongly recommend that every member of Congress review before voting on global climate change legislation, EPRI lays out a technology path for the electricity sector to return to 1990 emissions

levels by 2030.[4] This will require the long-term commitment of billions of dollars in energy research, development and deployment in every aspect of electric generation, transmission and consumption.

EPRI establishes specific technology deployment targets in seven areas: efficiency, renewables, nuclear generation, advanced coal generation, carbon capture and storage (CCS), plug-in hybrid electric vehicles (PHEV) and distributed energy resources. While one could argue that CO2 reductions from some of these targets could be slightly higher or somewhat lower, the overall picture is clear – we can get from here to a low carbon future, but only with substantial and consistent investment, the right policy choices and a realistic timeline. The most encouraging aspect of the study is that, as we move toward 2030, emissions levels can begin falling fairly dramatically and the potential of some of the more dire predictions of climate change can be minimized.

Socially Desirable and Undesirable Climate Costs

What this emphasizes in my opinion is that there will be a hierarchy of value in the dollars we spend attempting to address climate change. The best use of our national resources is in technology research and development, particularly in the areas of advanced coal development and carbon capture (which yield the greatest benefits in the out years), but opportunities for emissions reduction and avoidance exist across the sector. The next best use and the one that offers immediate opportunities for slowing

[4] Electricity Technology in a Carbon-Constrained Future, Electric Power Research Institute, February 2007.

carbon emissions growth and diversifying our fuel mix comes from government and private investments in energy efficiency, renewable energy, and increasing the efficiency of our existing fossil generation. What we should seek to avoid, however, is passing legislation that will force our customers, your constituents, to spend money on short-term emissions reductions that do not provide a long-term path to a low carbon future.

Funding technology research and development is critical. John F. Kennedy told a joint session of Congress in May of 1961 that America should commit itself to the goal, before the decade is out, of landing a man on the moon. Does this analogy apply to our global climate change challenge? Well, in 1961, President Kennedy had a space program, rockets, and a Congress committed to fund the necessary technology. We have neither. Federal spending on energy R&D has decreased 85% since the early 1980s.

Failing to take technology development timelines into account could well result in unintended consequences, such as large-scale fuel-switching to natural gas, which already is in tight supply and faces serious infrastructure constraints, and emissions shifting to countries without carbon controls. Large-scale fuel-switching to natural gas for electric generation will also require increased dependence on imported liquefied natural gas (LNG), exacerbating our balance of trade issues and reducing, not increasing, our energy security. During the 1990s, many mistakenly believed that a wholesale switch to natural gas-fired electric generation offered a painless path toward eliminating coal from the fuel mix. As our friends in the agriculture, chemical and fertilizer industries can attest, this was a dead end, and it continues to reverberate negatively throughout our economy.

MidAmerican's Climate Proposal – Phase I

In the first phase of our legislative outline, we suggest focusing on technology development and sector-specific reductions from existing technologies that may have incremental costs that are slowing deployment. In the electricity sector, for example, we propose six priorities:

1. Adoption of flexible renewable and clean technology portfolio goals.
2. More stringent energy efficiency mandates.
3. Policies to encourage efficiency improvements at existing facilities.
4. A ten-year, multi-billion dollar research and development program for emission reduction, funded equally by the private sector and the government
5. Removing the legal and regulatory barriers to the development of low-emissions technologies such as carbon sequestration and new nuclear development.
6. Tax policies to support these programs, such as a long-term extension of the renewable energy tax credit and clean coal initiatives.

While we are not experts on other economic sectors and the emissions reductions opportunities that exist in these areas, we have provided in our model "Global Climate Response Act of 2007" a listing of other sectors that must be addressed and some potential policy options for reducing emissions that are under discussion. Working on both the electricity policy recommendations and the options for other economic sectors

first will allow Congress to benefit from years of debate that has already taken place. The cause and effect relationships of new proposals in these defined policy areas are fairly well-understood. It will also allow you to spend more time focusing on how to integrate climate programs across these sectors and develop policies that support new technology development.

One excellent example of how this could work successfully is the long-discussed issue of establishing goals for the generation of electricity from renewable resources. As you know, these proposals were subject to extensive consideration in the conferences on the comprehensive energy bills of 2002, 2003 and the Energy Policy Act of 2005. Nonetheless, they have never been enacted. As long as renewable energy legislation recognizes (1) that achievement of the goals must be cost effective for customers; (2) that a **uniform** national renewable credit trading market is essential; and (3) that some reasonable flexibility must be included in these proposals to accommodate the concerns of regions with low levels of indigenous renewables by giving credit for efficiency and demand-side spending as well as investments in breakthrough zero emissions technologies, then I expect there would be broad bipartisan support for a national clean energy portfolio requirement. Developing this program as part of a comprehensive climate response program rather than just as narrow measure to mandate renewables would also address some philosophical concerns about the mandate both in Congress and the private sector. Our colleagues at Xcel Energy have further developed a very thoughtful proposal, initially proposed by then-Chairman Barton during the EPAct 2005 conference, on a Clean Energy Portfolio Standard that would achieve far greater carbon

emissions reductions than most Renewable Portfolio Standard (RPS) proposals. I would commend their proposal to the Committee's attention. Similarly, Congress should take another look at more stringent energy efficiency requirements across-the-board from small appliances to large buildings and adopt the most robust standards possible.

With regard to the public-private energy research and development partnership, this concept is receiving serious consideration by many who would normally be averse to new service adders. We simply cannot meet overly aggressive mandates and continue to provide our customers reliable, affordable electricity without technology breakthroughs. The investments necessary far exceed the ability of any utility company alone to finance the development of such technology given our regulated nature and the significant "first-mover" costs involved in making investments in new technology.

We also know that we cannot rely on Congress to provide an adequate funding stream for energy technology investment through annual discretionary appropriations. Making this public-private partnership a reality will require the industry to step forward and self-finance part of the program, but Congress must work with us to identify a way to ensure a consistent funding stream for this initiative that is insulated from the rest of the federal budget. Our industry has had a bad experience in this regard with the spent nuclear fuel program, and neither we nor our customers will support moving forward without this protection.

Another area that must be addressed is providing more predictable incentives for deployment of renewable energy and energy efficiency technologies. The Energy Policy Act of 2005 has led to an unprecedented boom in renewable development, particularly wind power. Unfortunately, though the two and one-half year extension of the Section 45 renewable production tax credits (PTCs) provided in EPACT did a great deal of good with regard to wind, the extension was still too short to facilitate much new investment in higher capital, base load renewable technologies such as geothermal and incremental hydro. Short-term extensions of the PTC have also created a near perpetual sellers' market for wind turbines that drives up the cost of projects and hampers the development of the domestic wind manufacturing industry. The single most effective step you can take to expand renewable energy production in the United States is a long-term extension of the Section 45 PTC.

The Need to Address Policy Issues on the Front End

The final major element of the first phase of any climate policy must be establishing policy frameworks for dealing with issues such as carbon capture storage, benefit allocations for plug-in hybrids, eliminating regulatory barriers to greater carbon efficiency for existing fossil generation and settling the spent nuclear fuel issue. Science Committee Chairman Gordon has made a constructive contribution to this discussion with his proposal for a geological survey to establish the United States' carbon sequestration capacity. This is exactly the type of forward thinking that we need.

Establishing limitations that have certainty while leaving uncertainty as to future litigation, regulation and implementation is a recipe for disaster.

Any thoughtful approach to climate change must include a return to nuclear development in this country. Unlike carbon sequestration, the main barrier to new nuclear projects in is not technological, but political -- the ongoing failure of the federal government to meet its obligations regarding spent nuclear fuel. For more than two decades, customers have paid these fees, utilities have collected them, and the federal government has failed to meet its obligations. Without regulatory certainty on spent fuel, the financial community will hesitate to provide the capital necessary for these billion dollar plus projects. We are not a large nuclear company, and I don't have a preferred solution, but this is a case where government has failed the private sector and the consumer. If you're serious about addressing global climate change, you must open the door again to nuclear power.

Moving forward on these policy issues will require hard choices on the part of Congress, not just setting targets and sanctions that the private sector must comply with. Make these issues part of the climate consensus now. Don't wait for them to become part of a supply crisis tomorrow.

MidAmerican's Climate Proposal – Phase II

Beginning around 2020, as new baseload zero- and low-emissions technologies become available, we propose moving to the second phase of an emissions reduction program.

We suggest a hybrid system of phased-in emissions reductions based on carbon intensity targets, together with trading and safety valve price mechanisms. While we do not recommend specific targets for carbon intensity reduction or a safety valve price in our proposal, we are generally comfortable with the levels proposed by Chairman Bingaman and Senator Specter in their discussion draft. We understand that Chairman Bingaman has indicated that he may make these provisions more stringent in a future draft of the legislation. We believe there is room in the out-years of the Bingaman proposal for tighter carbon intensity targets, but hope that any changes to the original Bingaman-Specter draft will be subject to rigorous analysis with regard to economic impact and technical feasibility.

Using the carbon intensity-based approach with a safety valve price has several advantages. While establishing a market price for carbon emissions, this approach would establish a cost ceiling for this transition should the reduction levels enacted into law years before prove unachievable. If the reduction requirements were not ambitious enough, the safety valve price will be a non-issue. Having a safety valve price in place also provides flexibility in terms of allowance allocations, particularly across economic sectors. Building one mandatory system that integrates all sectors of the economy will be a major challenge. Should Congress misallocate allowances, even based on the best estimates and analysis, the marginal cost of energy for consumers could become staggering. Done mistakenly, this could make the price spikes, capacity shortages and opportunities for market manipulation seen in the west in 2000-2001 appear minor by comparison.

The Need for New Energy Infrastructure

In addition to developing and commercializing low and zero carbon technologies, the American economy will need to build a new energy infrastructure to support hybrid vehicles, renewable fuels, remote sources of renewable electricity, carbon sequestration and interstate transport, and spent nuclear fuel. This will require enormous quantities of steel, cement, specialty alloys, chemicals and other commodities. We have already seen the impact that the rising economies of China and India have had on these markets and global emissions levels. While we support moving aggressively once the technology is there, building this infrastructure will be energy-intensive and there will be global competition for resources. We have suggested a ten-year deployment phase for new technology infrastructure, but this may well prove overly ambitious.

Efficiency Performance Requirements and Improvements

Once technology is in place, and assuming that the industry has been provided greater flexibility and certainty to allow for efficiency upgrades to existing plants, Congress should establish minimum generation performance standards that will phase-out the system's oldest, least fuel efficient fossil plants. Though these plants can serve economically efficient functions in our portfolios because their capital costs have been paid off for years, they operate at substantially lower levels of fuel efficiency than today's technologies. If companies have not taken advantage of the opportunity to

upgrade these existing facilities, they should be required to transition them out of the fuel mix.

On the other hand, those who claim that all pulverized coal plants are inefficient or "dirty", simply don't know the facts. Our supercritical Council Bluffs 4 Power Plant completed this year will be fifteen percent more efficient than the last generation of plants built in the late seventies and early eighties and even more so than those built in previous decades. Compared to the performance of the previous generation of plants, that's the equivalent of the emissions avoided by a 355 megawatt wind farm.[5]

Assuming some form of mandatory carbon regime, every new power plant will be built under the assumption of a carbon price of some form during the overwhelming majority of its useful life. Efforts to block the construction of even state-of-the-art supercritical coal plants throughout the country are extremely misguided. If coal opponents are successful, all that will be achieved at the end of the day is forcing electric generation back to natural gas and requiring older, less efficient plants to run longer and more often, harming both the environment and reliability. As suggested in MIT's recently released study, coal is an especially crucial fuel in meeting the world's pressing energy needs, even where constraints on carbon emissions are adopted.[6]

The Need for a Highly Skilled Workforce

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[5] These figures assume a 790 megawatt supercritical coal plant and a 33 percent capacity factor for wind turbines.

[6] "The Future of Coal: Options for a Carbon-Constrained World" Massachusetts Institute of Technology, March 2007, Executive Summary p. x.

On the issue of technology deployment, one last factor to consider is workforce. In order to accomplish this transition, the United States will need a much larger, better trained skilled labor force than we have today. The congressional science and labor committees should explore how to ensure that the United States has the workforce necessary to not only lead in technology innovation, but also one capable of carrying out an unprecedented infrastructure development program. Today, one of the most serious constraints we face in building projects is the shortage of skilled labor, and without a focused effort in this area the problem will become even worse. In the 2005 Energy Policy Act, Congress authorized the establishment of a National Power Plant Operations and Technology Educational Center, but the Department of Energy has not moved forward with this recommendation.[7] Last year's House-passed Energy and Water Appropriations bill directed DOE to begin this selection process, but this provision was not included in the year-end appropriations bill.[8] The House should continue to support that effort.

Allowances and Allocations

With regard to emissions allowances and allocations, any allowance allocation scheme should be based upon a multi-year, historic fuel-adjusted heat input methodology. In the power sector, some consideration can be given to adjustments to these allocations for companies serving relatively fast-growing regions, but providing allowances to non-

[7] Energy Policy Act of 2005, Section 1106.
[8] House Report 109-474, Title III.

emitters based on the so-called output-based methodology will simply create large wealth transfers unrelated to the overall goal of emissions reduction. Although I understand the desire of some to profit as a result of global climate legislation, it's unclear what public purpose would be served by distributing allowances to non-emitters. Companies that built hydroelectric dams many decades ago or nuclear plants in the sixties and seventies did not do so to avoid CO2 emissions and there is no reason to provide them with a financial windfall.

You may also consider auctioning all allowances, but providing a proportionally lower safety valve price. In other words, rather than providing allowances for ninety percent of historic demand in the first years of a program with a safety valve price of $10 per ton for the remainder of allowances, you could auction all allowances with a safety valve price of $1 per ton. This is economically neutral and would save you the inherently political process of determining allocations, helping avoid some of the allocation fiascos that we have seen in the European Union.

MidAmerican's Climate Proposal – Phase III

By using this transitional glide path, the U.S. should be poised for dramatic reductions in the third phase, beginning around 2030. I believe the country would be wise to acquire experience with the second phase's hybrid system before making a final decision on the most appropriate compliance system. A decade's experience with the carbon-intensity based program may demonstrate that a pure cap-and-trade system can work in an

efficient and equitable manner across economic sectors. On the other hand, we could learn that the safety valve mechanism serves a valuable function in discouraging market manipulation and speculation-driven acquisition of allowances. Or, should problems persist in design and oversight of these markets, a straight-forward carbon fee might prove to be the most effective method for reducing emissions.

The Need for Flexibility Measures – "Shock Absorbers" and "Off Ramps"

Any mandatory domestic program must include flexibility measures allowing future Congresses and presidents to adjust requirements based on periodic reviews of climate science, technology development, economic impacts, and international cooperation. We should design a program for reducing carbon emissions with "shock absorbers" that will allow us to learn, reassess and periodically modify our goals based on experience. I don't believe that anyone has enough knowledge today to accurately predict all the impacts of a comprehensive carbon emissions reduction program decades from now. Having this type of flexibility in legislation should also provide a helpful tool in international negotiations. Our negotiators will need every resource available to them – both carrots and sticks -- to encourage other countries to adopt and enforce comparable emissions reduction programs while ensuring that the United States does not bear a disproportionate share of the climate change burden.

Before moving to mandatory emissions caps, there also must be a mechanism in place to suspend these requirements if other major emitting nations have not adopted comparable

and enforceable programs. I'm not proposing that every developing country in the world adopt the same emissions reductions on the same schedule as the United States. It is essential, though, that everyone is pulling in the same direction and contributing proportionately to global emissions reductions. Suspending the imposition of a mandatory emissions reduction program should not be done unilaterally by the President. We would recommend that such a recommendation be considered by Congress under "Fast Track" legislative procedures, but this "off ramp" would let us move forward with enacting a climate policy program now, but give our international negotiators far greater leverage.

A Cautionary Note on Cap-and-Trade

Finally, I'd like to raise a cautionary note about the cap-and-trade concept. Many are advocating immediate reductions based on a flawed understanding of cap-and-trade. It can be a useful tool, but it is not a panacea.

Cap-and-trade is a regulatory mechanism, a rationing system with a secondary trading market. It does not supply emissions-free power; it does not bring new technologies on-line. Cap-and-trade does not reduce prices for non-emitting technologies. It merely raises prices for carbon-based emissions.

As Chairman Dingell has reminded us, every carbon-consuming action (power generation, driving, manufacturing) will still have an equal and opposite reaction, and we

must identify new ways to manage the reaction side of the equation. While I agree that market signals will accelerate technology development some, we have no idea how much and the laws of physics can have a stubborn resistance to economic theory.

With regard to comparisons with sulfur dioxide, the SO_2 trading system created by the 1990 Clean Air Act amendments is rightly viewed as a great success, but reducing carbon dioxide emissions is much more complex. SO_2 is a byproduct of coal combustion. CO_2 is the product of all combustion. We cannot achieve easy reductions merely by shifting to low sulfur coal, as many did with SO_2. The sulfur program applied only to the utility sector, not economy-wide, and off-the-shelf technology was already available at the time to reduce SO_2 emissions. Lastly, the SO_2 program addressed an immediate, well-understood national and regional problem, not a challenge whose impacts we are only beginning to define that must be dealt with globally on a time frame measured in decades and centuries.

Summary

Given these complexities, we believe that a phased-in, technology and policy-driven approach provides the tools necessary to successfully reduce long-term global greenhouse gas emissions while minimizing the costs and risks to our economy. As MIT's recently-released study suggests, it is not likely that any one path to emissions reduction will emerge; all will play a role in proportions in that are impossible to predict today.

We have attached a detailed legislative outline of our proposal for your review. I hope this will prove useful to you and all members of the Committee. Thank you and I would be pleased to answer any questions you may have.

JEFFRY E. STERBA
CHAIRMAN, PRESIDENT AND CEO
PNM RESOURCES
TESTIMONY BEFORE THE
SUBCOMMITTEE ON ENERGY AND AIR QUAILTY
HOUSE ENERGY AND COMMERCE COMMITTEESENATE ENERGY
March 20, 2007

Introduction

Good morning Chairman Boucher, Congressman Hastert, and distinguished Members of the Subcommittee on Energy and Air Quality. Thank you for inviting me here today. I am Jeffry Sterba Chairman of the Board, President, and Chief Executive Officer of PNM Resources.

I believe that climate change is the single greatest long-term environmental and economic challenge facing our industry. To address climate change in the time frame recommended by the scientific consensus, *i.e.*, 550 ppm by 2100,[1] we will have to fundamentally change how we make and use energy. By acting now and implementing a carefully-designed program that takes advantage of existing commercial technologies while we transition to new technologies, which must be developed and commercialized, we can create economic opportunity and improve the quality of life in our nation as we move toward a cleaner, more efficient, and technologically advanced society.

[1] See *e.g.*, *The Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC).* So far only the Working Group 1 - Summary for Policy Makers has been published. Also, Legggett, Jane, *CRS Report for Congress: Climate Change: Science and Policy Implications*, January 25, 2007; M.G.J. den Elzen and M. Meinshausen, *Meeting the EU 2°C climate target: global and regional emission implications*, Report 728001031/2005.

PNM Resources

First, let me be clear that I am here today representing PNM Resources. PNM Resources is an energy holding company based in Albuquerque, New Mexico, with consolidated operating revenues of $2.5 billion. Our electric generation is primarily a mix of coal, nuclear, wind and natural gas. Through its utility and energy service subsidiaries, PNM Resources supplies electricity to 738,000 homes and businesses in New Mexico and Texas, natural gas to 470,000 customers in New Mexico, and electricity to numerous wholesale customers throughout the southwest. Its major subsidiaries are PNM, Texas-New Mexico Power and First Choice Power, a deregulated competitive retail electric provider in Texas. In November 2006, we announced a Joint Venture with Cascade Investments for the purpose of long-term investment in both in wholesale and retail electricity sales, electricity generation and energy trading.

As the CEO of an electric and gas utility holding company, I concluded three years ago that prudent risk management necessitated that voluntary and deliberate steps were needed to position PNM Resources and its subsidiaries to operate in a carbon-constrained world. In 2003, our Board of Directors adopted the goal of reducing the intensity of greenhouse gas emissions from our utility operations in New Mexico by 7 percent by 2009. Other actions we have voluntarily undertaken to manage and reduce emissions of greenhouse gases (GHG) at PNM and our other utility subsidiaries include:

- *Greenhouse Gas Emissions Inventory:* We have completed an inventory of GHG emissions for our New Mexico operations and have begun

evaluating what PNM Resources potential compliance costs exposure will be under different possible federal policy scenarios.

- *Pricing Carbon in Resource Planning:* We are now internalizing the costs of carbon dioxide emissions into our electric supply planning processes to account for potential future greenhouse gas regulations. This enables us to make more informed resource decisions and allocate capital based on potential future costs of compliance with greenhouse gas regulation.
- *Diversifying Our Generation:* We have diversified our portfolio of generation assets. A generation portfolio that was once dominated by coal and nuclear power, now includes natural gas combined-cycle, wind, distributed solar, demand-side resources along with coal-fired pressurized fluidized-bed technology. This portfolio has provided our customers with a cleaner, less carbon-intensive portfolio of resources than we had in 2002.
- *Renewable Energy:* We have a 25-year power purchase agreement for all of the output from the New Mexico Wind Energy Center. The 204 MW of capacity from this facility represents over 8% of our generation capacity. In 2005, we entered into an agreement with independent developers to supply power to PNM Resources from a 35 MW biomass project. We have also launched a program that pays customers 21 cents per kwh in incentives payments and credits for power produced from customer-owned solar PV systems.
- *Biodiesel:* We have switched to using biodiesel fuel in 57 percent of our diesel-powered vehicle fleet in New Mexico.

- *Carbon Sequestration:* We have participated in a number of programs aimed at reducing or sequestering greenhouse gases, and
- *Energy Efficiency*: We have made significant investments in energy efficiency to offset 10% of annual energy demand growth in our Texas service territory. In 2006, we introduced natural gas efficiency programs to our New Mexico customers and earlier this year we filed a suite of electric energy efficiency programs with the New Mexico Public Regulation Commission seeking approval to spend more than $8.0 million per year on energy efficiency over the next three years.

Utility Industry

In fact many companies in the electric utility sector have been very successful at reducing GHG emissions through voluntary actions. According to the U.S. Department of Energy, the electric power sector reported 282 million metric tons of CO_2 equivalent emissions reductions in 2004, the last year that data is available.[2] But we are going to need to do better in the future to address the challenges of climate change. And we cannot do it without federal legislation that is environmentally effective, economically sustainable, and fair.

As you are aware, there are varying opinions within the electric utility industry on what shape federal climate legislation should take. It is also true that we all share a genuine concern about whether or not significant emissions reductions can be achieved without negative economic impacts to shareholders, our customers and the economy.

[2] Source: EIA Voluntary Reporting of Greenhouse Gases Program, 2004 Annual Report. Analysis by the Edison Electric Institute.

The electric industry is the most capital intensive sector of the U.S. economy. We face a new wave of capital expenditures in the next 15 years that – in sheer magnitude – is unprecedented in recent times. According to the Cambridge Energy Research Associates, the current cumulative asset value of the electric industry is approximately $900 billion and between now and 2020, the industry will spend: $250-300 billion in new generation; $50 billion in environmental retrofits (the Clean Air Interstate Rule and Clean Air Mercury Rule); $150 billion in transmission; $300 billion in distribution; and $25 billion in conservation and related expenditures; totaling about $775 billion. Compliance costs for GHG regulation are expected to add an additional $70+ billion (at the low end). To say it another way: in the next fifteen years the electric industry will make capital expenditures that will have a cumulative value in excess of the entire industry's net present asset value.

But, I believe there is general agreement that the greatest impediment to achieving cost-effective GHG emissions reductions is the absence of a robust technology portfolio. Significant GHG reductions are attainable only with a full suite of technology options; including increased energy efficiency, continued development of renewable resources, IGCC and other advanced clean-coal technologies, carbon capture and storage, and advanced nuclear. There is no single, silver bullet. While a few of these technologies are commercially available - though at a higher cost than conventional generation technologies - many are not. Making these technologies commercially available at a reasonable cost is critical to addressing climate change in both the short and long term.

We desperately need to close the technology gap. I agree with others who have likened today's race for carbon-friendly technology to President Kennedy's space race which harnessed the scientific, commercial, and technological talents of a generation of Americans to put a man on the moon. Just as the space race spawned today's information technology age, the clean energy race has the potential to launch the U.S. as a world leader and exporter of carbon-free technology.

Coal in a Carbon-Constrained World

One of the areas where technology needs to play a particularly important role is in the future use of coal. Today, coal is the backbone of our electricity system and it is essential for a prosperous American economy. Coal accounts for about half of all electricity generation, and over 90% of the coal produced in the U.S. fires electric power generators. Coal's central role results from its domestic abundance and accessibility, which translates directly into energy security and economic affordability. With one quarter of the world's known recoverable reserves, the U.S. alone has coal resources equivalent to the entire world's proven oil reserves. This 250 year supply of coal is all located safely within our borders, easily extractable, and readily transportable around the country for conversion into electricity at a fraction of the cost of many alternative fuels. An economically sustainable policy approach to climate change legislation must recognize that coal will continue to play a role in our energy future, and that policies are needed to speed the transition to low- and zero-emission coal combustion technologies that can cost effectively capture and store CO2.

Technology to capture and store carbon that is emitted from coal plants is a critical component in any carbon-constrained world. A 500 MW coal plant produces four million metric tons of carbon emissions per year alone. Yet, demonstration projects for storage of one million metric tons per year of CO2 are not expected to begin until 2010, assuming sufficient budgets are provided for these activities. In another illustration of my concern that we merely are paying lip service to the need for a robust technology portfolio, the DOE FY 2008 budget recommends funding for a program that can only support the initiation of three or four of these large scale demonstrations, despite the fact that there are seven DOE regional sequestration partnerships throughout the country. This is only part of a larger problem. The Department of Energy's total budget authority for energy R&D dropped by over 85 percent (in real terms) from 1978 to 2005.[3] Continued insufficient government funding delays the development of the robust suite of technologies that our industry so desperately needs.

We need to fund research, development, demonstration and deployment very aggressively so that we can bring carbon capture and sequestration technologies online as soon as possible. And, if mandatory emissions reduction targets are not in sync with the timing of these technologies becoming commercially available, including the sufficient time necessary to permit and construct these new technologies, we run a serious risk of massive switching to natural gas and the associated increase in prices that greater demand will create.

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[3] GAO Report: *Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs*, December 2006, GAO-07-106.

Addressing Climate Change Today

I am not saying that we need to wait to begin reducing our carbon footprint until these technologies are fully deployed. There are a number of things – "low hanging fruit" -- that can be done right now. Energy efficiency measures are at the top of this list and can achieve enormous reductions – immediately and cost-effectively. They can even save Americans money. For example:

- In South Africa, Eskom[4] implemented a program whereby 5,300,000 compact fluorescent lights (CFL) were exchanged for incandescent lamps, free of charge to the consumer. The energy-efficient lighting program consisted of two strategies, namely, door-to-door and exchange point campaigns. This efficient lighting program resulted in a massive 229 MW savings.
- A recent energy efficiency potential study we have completed for PNM's New Mexico service territory found that an annual investment of $22.2 million dollars would result in energy and capacity savings sufficient to meet over 40% of our new system growth and at half the costs of conventional generation.
- In New Mexico, if every residential customer in Albuquerque and Santa Fe replaced five incandescent light bulbs with five CFLs, it would reduce CO2 emissions by 85,000 tons per year, or the equivalent of taking 14,000 cars off of the road (based on 6 tons CO2/year for an average car). Right now, the payback on a CFL that is purchased at a wholesale-like store (Costco, Sam's, etc.) is just over 4 months. But to accomplish this we need to change the regulatory model so that energy efficiency has a business basis and utilities at least are financially indifferent between investments in energy efficiency or supply-side resources.

A more controversial measure worth pursuing is creating an exemption for efficiency upgrades to existing coal plants that might otherwise trigger new source review. These efficiency improvements are important for environmental as well as economic reasons. For example, an improvement of only 1% in the

[4] Eskom is a South African electric public utility, established in 1923 as the Electricity Supply Commission (ESCOM) by the government of South Africa. It is the largest producer of electricity in Africa, and is among the top seven utilities in the world in terms of generation capacity and among the top nine in terms of sales. Eskom operates a number of power stations, including the Kendal Power Station, the largest coal-fired power station in the world, and the Koeberg Nuclear Power Station.

heat rate of an average 500 MW coal-fired unit would reduce CO2 emissions by over 30,000 tons per year. Another way to look at it, provided by the Coal Utilization Research Council, is that a 1% improvement in the average coal-fired power plant efficiency (from 33% to 34% at existing units) would generate about the same amount of electricity as all non-hydro renewable electricity in 2005 (60 Bkwh). While some argue that investing in these plants may prolong their useful life, I would make the case that it is better to improve the operation of these existing plants with small investments that produce more energy for less coal and less CO2, than to build new plants today – with a much longer useful life -- at a substantial cost which face the risk that they will be technologically and environmentally obsolete shortly after they enter service.

Federal Climate Legislation Recommendations

Climate change is a century long challenge but the time to act is now. Each year we delay taking action increases the risk we will be faced with having to achieve even steeper emissions reductions in the future, at potentially greater costs. I have two sets of policy recommendations I would like this subcommittee to consider: an overall architecture for a comprehensive climate change bill, and some steps that need to be taken immediately, either in the context of climate change legislation to be passed in this Congress, or separate legislation to be enacted in this Congress if climate legislation begins to stall. First, climate change legislation should:

1. Account for the global dimension of climate change through U.S. participation in negotiations for a post-2012 international climate change

framework. U.S. leadership is essential to establishing an equitable and effective international accord to reduce global GHG emissions. Moreover, we should not make U.S. action to address climate change contingent on equal action by all developing nations.

2. Provide for policy initiatives that will fundamentally change the way we produce and use energy. This will require that we establish a national technology roadmap that includes an aggressive research, development, demonstration and deployment program targeting a full suite of carbon-friendly, breakthrough technologies and long term, stable funding that is not subject to the vagaries of annual Congressional appropriations.
3. Be cost-effective and allow for economic growth while achieving meaningful emissions reductions. Both objectives can be achieved through an economy-wide, federal cap and trade program that sets mandatory emissions reduction targets that allow a slow, stop, and reduce emissions trajectories over the next 50 to 100 years. The Acid Rain program, which was very successful, is an instructive starting point for climate legislation.

In addition, there are important policy tools that can be used as first steps toward addressing climate change that we need to implement right now – as soon as legislatively possible:

1. Extend the Production Tax Credit for Renewables for ten years.
2. Extend the Investment Tax Credit for Renewables for five years.
3. Fix the Loan Guarantee Program created by the Energy Policy Act of 2005.
4. Fix the Tax Code to allow depreciation over five years instead of the current 20 years for Smart Meters.

5. Promote Plug In Hybrids and other electric-drive technologies through tax credits and R&D funding of new technologies that will increase their cost-effectiveness and deployment.
6. Require large scale Carbon Capture and Storage Demonstration Projects and address the licensing and liability issues.
7. Fully authorize and fund Research, Development, Demonstration, and Deployment of more climate friendly technologies and applications.[5]
8. Provide the Nuclear Regulatory Commission with the resources necessary to extend the licenses of existing plants and permit the next generation of plants at the pace necessary to meet the demand for nuclear generation in the next 20 years.

To summarize, we need legislation that recognizes the realistic limits of today's commercial technology and the economic risks currently associated with addressing climate change for my industry and our customers that does not create undue economic harm. We need a phased approach that begins with reductions that can be achieved through aggressive application and deployment of existing technologies and rewards those who go beyond their obligations by giving credit for early action. We need additional phases that are commensurate with technology advancement – which we need to begin funding and promoting today.[6] I also urge your consideration of cost control mechanisms that do not undermine ultimate environment goals but prevent adverse economic impact during the initial transition and enable a long-term price signal for major capital projects. I would also urge that the Subcommittee design legislation that will not create winners and losers among generation sources – particularly with respect to existing resources -- but will promote all types of fuel sources and will recognize the disproportionate impact mandatory reductions will have on certain

[5] The Electric Power Research Institute is currently working on an analysis of technology needs in a carbon-constrained world.

regions and existing resources. Ultimately our goal should be to design and implement legislation that will promote a smooth transition to a cleaner, more efficient energy economy.

Conclusion

Chairman Boucher, Thomas Edison once observed, "The best way to predict the future is to invent it." Under your leadership, this Subcommittee can invent a better future for our children by steering our country towards an environmentally sound, economically sustainable and equitable legislative solution to climate change.

Thank you for your time and consideration. I would be pleased to answer any questions you might have and I look forward to being of service in any way I can to this Subcommittee.

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