S. HRG. 109–37

COAL CONFERENCES

SYMPOSIUMS

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

ON

THE FUTURE OF COAL CONFERNECE

MARCH 10, 2005

APRIL 21, 2005

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COAL CONFERENCE

THURSDAY, MARCH 10, 2005

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 2:41 p.m., in room SD-106, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. First of all, for those of you who are going to be at the table and talk with us and for those of you who came because of the nature of this event and the subject matter and those who have submitted ideas, we received about 80 different concrete ideas, evaluations, suggestions, and the like.

First, I cannot do anything about the Senate schedule. We are making headway there, so I would not dare. It has taken us 8 years to get a bankruptcy bill, and if we have to vote all day and all night, you are just going to have to be inconvenienced along with me and the rest of us Senators. So we are going to try. Right now there are three more scheduled, but we have about 20 minutes, and then we will run down and see what happens. It may be a chance for Senators to exchange here where one can stay while one votes.

Having said that, I think you all know why we are here. Clearly, the United States of America desperately needs to look to a future where we have a diversified use of energy sources. Some people speak of renewables. We think we ought to do everything we can in that regard. Some speak of adding more and more natural gas to our use here in America. We are trying to look at that. All the other kinds of energy, including nuclear, everybody is looking at those, but clearly the king of all that is coal. We currently get 50 to 52 percent of our electricity from coal, and there is plenty of coal in America at various places.

We just have to find out here today and in our deliberations and legislation in the next 3 or 4 months how we can best move ahead to use more of our coal in a cleaner manner so that we can say coal is contributing to our future in an environmentally sound way. We all understand that is relative depending upon one's view with reference to the pollutants and how much we can and cannot do.

Nonetheless, we must proceed with evaluating what there is and we have tried very hard to put together a different approach. If we had a hearing, we would have three of you and that would be it.

Today we are going to have more of you, provided that you cooperate and be very brief. If you will do that, that will help us immensely.

Having said that, it is only fair that I ask if a member of the minority would concur that we should proceed or you may make a statement, whatever you would like, Senator. You can start with a statement. Then we will proceed.

STATEMENT OF HON. BYRON L. DORGAN, U.S. SENATOR FROM NORTH DAKOTA

Senator DORGAN. Mr. Chairman, I did not hear all that you said, but let me concur with whatever it was.

[Laughter.]

The CHAIRMAN. I think you would agree with what I said.

Senator DORGAN. But let me just make the same point just in 30 seconds. There is no question that when we write an energy bill—and we need a new energy policy—it needs to include coal. The aggressiveness with which we pursue clean coal technology to try to advance the interests of developing our coal resources, hopefully at some point in the future in zero emission plants, which I believe we can do if we decide to do that, I think that is just a very important part of understanding what new energy policy will be. Yes, there will be new things but included in an energy policy has to be the use of these vast resources of coal reserves. So I think this is an excellent opportunity to share views.

One thing has happened, Mr. Chairman. They have actually just added another vote. So it is not always very convenient to do things around here as we run back and forth to votes. But I want to thank everybody who has come to this discussion.

The CHAIRMAN. Senator Salazar, you are always a faithful attendee. If you want to make a couple of comments, go ahead. You might not have a chance before the afternoon is out, and I will get back here.

STATEMENT OF HON. KEN SALAZAR, U.S. SENATOR FROM COLORADO

Senator SALAZAR. Coal is an extremely important resource for all of us in this country, and in my State of Colorado, in particular, we have many members of the mining industry who have been very active, especially in the area of clean coal in the western part of Colorado. So I am very much looking forward to the presentation of the panel. I applaud our chairman and the members of this committee who have pulled together this conference.

The CHAIRMAN. Thank you, Senator.

We are going to proceed, Senator Craig, and you will have an opportunity in between here to make a statement. We are going to start right down the line this way. Alan Beamon, EIA.

STATEMENT OF ALAN BEAMON, ENERGY INFORMATION ADMINISTRATION

Mr. BEAMON. Thank you very much. I appreciate the opportunity to appear before you today and give our view on the long-term outlook for U.S. coal markets. As you said, my name is Alan Beamon. I am responsible for the EIA's long-term projections for electricity

and coal markets. I am joined today by two colleagues at the end of the table here, Betsy O'Brien and Rick Bonskowski who work on current coal data issues and analysis.

The projections I am going to be discussing are from our recently released Annual Energy Outlook 2005. The full report, with more than 30 scenarios, is available on EIA's web site today.

Driven by growing needs for electricity generation, total coal consumption is expected to increase by 38 percent between now and 2025. Overall, coal consumption in the electric power sector is expected to grow as existing plants are used more intensively and new plants are added. We project that between now and 2025, 87 gigawatts of new coal capacity will be added, and coal plants are expected to continue to produce roughly half the power in the country.

Increased coal production from the West is expected to be the primary supply source for growing power needs. Little change is expected in Appalachian coal production. Western coal production has been growing steadily since 1970 and is projected to continue to grow, especially in the Powder River Basin where vast reserves are contained in thick seams accessible to surface mining.

Following a trend that began in the early 1990's, U.S. coal exports are expected to continue to decline gradually, falling from roughly around 43 million tons to 26 million tons. Our coal imports are projected to grow slightly again from 25 million tons to 46 million tons in 2025.

Minemouth coal prices are expected to rise in the near term because of growing demand and then level off as demand slows down until we start building new powerplants. By 2025, we are expecting coal prices of a little over $18 a ton.

That completes my statement. We are certainly able and willing to answer any questions that you have.

The CHAIRMAN. Thank you very much.

Mr. Frank Burke.

STATEMENT OF FRANK BURKE, VICE PRESIDENT, SCIENCE AND TECHNOLOGY, CONSOL ENERGY

Mr. BURKE. Mr. Chairman, thank you very much for inviting me. My name is Frank Burke. I am vice president of science and technology for Consol Energy. We are a major U.S. coal and coalbed methane producer.

Under any foreseeable circumstances, coal will continue to be used in the United States and elsewhere as the predominant fuel for electricity generation for the next century and beyond. With proper investment, domestic coal can meet the increasing demand for electricity while satisfying environmental and economic goals. Otherwise, we become increasingly dependent on foreign sources to fuel our electricity supply.

The recent DOE Annual Energy Outlook underscores the risk of failing to make sufficient investment in coal production and transportation and use.

DOE forecasts that by 2025 natural gas will be used to generate 24 percent of our electricity, doubling natural gas-fired generation in absolute terms. Effectively this growth will come from imported LNG and imports in total will grow to about 30 percent of our total

natural gas consumption. How ironic to emphasize the need for less dependence on foreign energy while making our electricity supply increasingly dependent on those same foreign sources.

The necessity of expanded domestic coal use can first be met by assuring regulatory certainty for the criteria emissions of SO_X, NO_X, and mercury to ensure continued use of our existing generating fleet and to accommodate new coal fuel generating capacity. Enactment of provisions such as those embodied in S. 131 would provide this kind of certainty.

Second, advanced clean coal technologies must be developed and deployed. We recommend enactment of comprehensive energy legislation such as H.R. 6 that provides authorizations for coal R&D, the clean coal power initiative, and financial incentives for deployment of clean coal technologies.

Finally, we believe that necessary investments must be made in coal transportation infrastructure and particularly the locks and dams of the inland waterways that are vital to the transportation of 120 million tons of coal annually. Congress must appropriate adequate funds and utilize the Inland Waterways Trust Fund for this purpose.

Thank you.

The CHAIRMAN. Thank you very much.

We are going to now move to David Owens from Edison Electric. Thank you very much for coming. We appreciate your comments also, sir.

STATEMENT OF DAVID OWENS, EXECUTIVE VICE PRESIDENT, EDISON ELECTRIC INSTITUTE

Mr. OWENS. I am David Owens, executive vice president of the Edison Electric Institute. I certainly do appreciate this opportunity to discuss the future use of coal. Using the poster boards that I brought with me, I would like to make several key points about current and future coal consumption in this country.

The United States is the Saudi Arabia of coal. Coal is the fuel for more than half of our electric generation. As the purple area of figure 2 shows, coal is the predominant fuel in five of the nine major regions of the country. This is due to its reliability, affordability, and fuel source security. In addition, even as the industry has significantly increased the amount of electricity from coal-fired generators, we have been successful in significantly decreasing emissions of sulfur dioxide and nitrogen oxide. Controls to reduce these emissions also are reducing our mercury emissions by about 40 percent as well. Thus, coal can be used to be compatible with our environmental goals.

As you all know, our society is becoming increasingly more dependent upon electricity and electricity will continue to power our economic growth. As the blue area of figure 1 shows, the Energy Administration projects that coal use for electric generation will continue to grow. That was certainly the point that Alan emphasized. This is true even if there is greater market penetration of renewables and other resources that increase reliance on natural gas if natural gas prices decline significantly. Thus, under any reasonable scenario, coal is needed for baseload electricity growth.

But for the electric industry to be able to depend on coal to meet future electricity demand, the industry needs greater regulatory certainty in several areas.

First, our industry continues to be a strong supporter of a sensible multi-emissions bill to harmonize overlapping requirements to reduce SO_2, NO_X, and mercury emissions.

Second, as the industry prepares for the construction of major new baseload generation, we are also working to improve Federal-State cooperation, recognizing that the Federal Energy Regulatory Commission, which regulates wholesale power transactions, and the States that regulate retail electric service and planning and resource adequacy, need some harmony.

And finally, we support public policies that foster greater deployment of advanced clean coal and integrated gasification combined cycle technologies. As you know, these technologies help reduce carbon intensity and hold the promise of cost effective capture of CO_2 emissions and provide for permanent carbon storage.

To help to bring these technological improvements to market, we strongly support tax credits, accelerated depreciation, and other methods. We also support more rapid amortization of pollution control equipment.

Thank you for this opportunity. I look forward to your questions.

The CHAIRMAN. Thank you very much.

We are moving to NCEP, John Holdren. Mr. Holdren, thank you very much.

STATEMENT OF JOHN HOLDREN, CO-CHAIR, NATIONAL COMMISSION ON ENERGY POLICY

Mr. HOLDREN. Thank you, Mr. Chairman.

This country needs to expand coal use both for electricity generation and for reducing dependence on oil and natural gas in other applications, but it also needs to take serious steps to reduce the risks from climate change. Reconciling those two objectives requires a three-pronged approach, as recommended in the recent report of the bipartisan National Commission on Energy Policy that I had the privilege of co-chairing.

The first of those prongs is to provide a market signal that begins to slow the growth of carbon emissions, but at a pace that does not force premature retirement of existing coal-fired capacity. The commission's proposal for a carbon emission permit system that starts in 2010, phases in gradually, and controls the permit costs with an initial safety valve price at $7 per ton of carbon dioxide is designed to achieve that.

The second prong is speeding up the commercialization of integrated gasification combined cycle multi-purpose coal plants which can sharply reduce emissions of criteria air pollutants, which offer the potential for affordable, cost effective retrofit to capture CO_2, and which can produce liquid and gaseous fuels, as well as electricity. The commission proposes $400 million a year in Federal early deployment incentives over the next decade in order to bring into operation 10 gigawatts of carbon capture-capable IGCC plants.

The third prong is accelerating the development and the commercial scale demonstration of the carbon capture and sequestration technologies needed to realize the potential of IGCC plants to dras-

tically and affordably reduce their carbon dioxide emissions. For that purpose, the commission has proposed $300 million a year in Federal support over the next decade.

The commission's analysis indicates that under its proposals coal use in the United States would increase from 1.1 billion tons in 2003 to 1.3 billion in 2020, while U.S. greenhouse gas emissions in 2020 would be 540 million tons of carbon dioxide equivalent below the business-as-usual trajectory.

I also want to emphasize the commission's proposals are revenue neutral. The costs of all of the recommended R&D and the costs of the early deployment incentives would be covered by the revenues from the emission permit sales.

I finally want to note that a further benefit of pursuing U.S. leadership in advanced coal technologies would be to advance the use of those technologies in China and India where large impending increases in coal use are going to imperil the whole world's capacity to limit climate change risks unless that coal is used in ways that capture and sequester the resulting carbon dioxide.

Thank you.

The CHAIRMAN. Thank you. Very interesting.

Now, you are with the first person here.

Ms. O'BRIEN. Yes.

Mr. BONSKOWSKI. Yes.

The CHAIRMAN. Why did they set you up? Did they think he needed your help?

[Laughter.]

The CHAIRMAN. Jack Gerard, National Mining Association.

STATEMENT OF JACK GERARD, NATIONAL MINING ASSOCIATION

Mr. GERARD. Thank you, Mr. Chairman, and members of the committee.

The coal industry is grateful for this opportunity to spell out the future role of our Nation's most abundant domestic source of energy. This conference is especially relevant to the larger question before the Congress, which is how to meet the Nation's growing needs for energy in the most environmentally and economically responsible way.

Today coal generates more than half of the Nation's electricity and is expected to generate one-half or more of the 50 percent increase in electric power the country is projected to need by 2025. This means electricity generation will require at least 1.425 billion tons of coal in 2025, or about 42 percent more than is used today.

The factors that account for this resurging coal demand are often overlooked, even though they are persuasive to energy markets. In a time of growing energy dependence on offshore sources, when geopolitical uncertainty and growing demand for finite fuels haunts global energy markets, coal provides the United States with a 250-year supply of energy safely from within our own borders. At a time of energy price volatility, the price of coal remains remarkably stable and is expected to remain so. EIA projects that coal will maintain its significant cost advantage over natural gas well into the future.

And while the environmental challenges of coal utilization should not be overlooked, neither should the impressive reductions that coal-fired plants have already made or the continuing environmental contribution expected from a suite of advanced clean coal technologies.

For these reasons, coal is and will remain the primary provider of electric power to the Nation. The marketplace is choosing coal and we hope public policy will support this choice to meet the future demand and bring the Nation closer to energy independence.

Thank you.

The CHAIRMAN. Thank you very much.

Now let us proceed with David Hawkins, NRDC. Mr. Hawkins, it is nice to see you again.

STATEMENT OF DAVID HAWKINS, NATURAL RESOURCES DEFENSE COUNCIL

Mr. HAWKINS. Mr. Chairman, it is nice to see you again. Thank you very much.

Coal can continue to play an important role in the U.S. energy mix, but public acceptance of new coal investments depends on improving coal's environmental performance. In particular, attempts to build new coal plants that do not control CO_2, the global warming pollutant, will encounter growing community opposition, along with resistance from regulators and investors.

Global warming is real. It will not go away. Global warming policy will change early in the operational life of projects that are being planned today. As Excel Energy's resource planner stated last month, you would be crazy not to consider CO_2 costs in planning a new coal plant.

Now, coal can be made compatible with a safe climate, but only if we act without delay to deploy new technologies that capture CO_2 and keep it out of the air.

To do this, we urge Congress to adopt a program that combines a schedule for binding limits on CO_2 with substantial financial incentives for the construction of low CO_2 energy systems, including coal gasification with CO_2 capture and geologic storage. This program not only will put us on the right track to leave our children with a safe climate, it will also reduce our dependence on less secure sources of energy and it will position U.S. businesses to take advantage of an emerging global market for clean energy products.

Thank you.

The CHAIRMAN. Thank you very much.

Jack. How do you say your last name?

Mr. LAVIN. Lavin.

The CHAIRMAN. Lavin. You are from the State of Illinois?

Mr. LAVIN. State of Illinois.

The CHAIRMAN. What is your title?

Mr. LAVIN. I am the director of the Department of Commerce and Economic Opportunity for the State of Illinois.

The CHAIRMAN. All right. Please proceed.

STATEMENT OF JACK LAVIN, DIRECTOR, DEPARTMENT OF COMMERCE AND ECONOMIC OPPORTUNITY, STATE OF ILLINOIS

Mr. LAVIN. Mr. Chairman and members of the committee, on behalf of Governor Rob Blagojevich, I thank you for this opportunity to discuss coal and Illinois' innovative efforts to cleanly use it. This discussion is quite timely because of the high price of natural gas, fertilizer, and transportation fuels. Coal is here for the digging and not under the control of a government or cartel that may not have America's best interests at heart.

But coal, as we rely on it today, cannot be sustained as a reliable source of energy if it goes into aging powerplants so old some are eligible for Social Security.

[Laughter.]

Mr. LAVIN. Any future scenario for coal-fueled energy must include a serious, detailed plan with meaningful deadlines to replace old, inefficient coal plants. We must not tune out coal critics in this regard.

The Department of Defense recently announced its clean fuels initiative to catalyze domestic industries to produce military fuels from alternative, secure domestic resources, including coal through gasification.

Coal can also promote food security. High, volatile natural gas prices have caused high, volatile fertilizer prices. As a result, U.S. fertilizer plants are shutting down, and we now import over 50 percent of America's fertilizer needs from the Middle East, Russia, and China. America's food security is at risk. We need a change in feedstock.

That is why Governor Blagojevich is supporting at the East Dubuque nitrogen plant in East Dubuque, Illinois, a coal to corn initiative. We are converting its natural gas feedstock to coal to produce fertilizer, ultra-clean transportation fuels, and electricity, leading to coal mining jobs, manufacturing jobs, and lower cost for farmers, a triple crown, all while utilizing clean coal technology.

Steelhead Energy in Johnson City, Illinois is proposing a 500 megawatt coal gasification project. They want to make substitute natural gas from coal.

These projects are not dreams. They are America's path to energy independence and the security that comes with it. FutureGen is also an essential part of this strategy.

We are, plain and simple, a Nation energized by a fuel mix that includes coal, and today we also are a Nation who must face up to the challenge of using all of our resources in an efficient, effective, and environmentally safe manner. Coal must be included in a diversified energy portfolio. We must continue developing renewable energy technologies, as we use coal gasification to produce ultra-clean, low sulfur fuels for transportation, national defense, and electric generation. We have a number of items here up for a call to action.

I thank you for allowing me to give you my thoughts today.

The CHAIRMAN. You are very welcome. You talked about the old plants in need of Social Security. Do you think that some of them could go into personal accounts?

[Laughter.]

The CHAIRMAN. They might grow that way. Right?

Mr. LAVIN. I think we need another hearing for that.

[Laughter.]

The CHAIRMAN. Okay, we will not have an argument over that. Who is next? Could you tell us who you are?

STATEMENT OF LUCY QUERQUES DENETT, MINERALS MANAGEMENT SERVICE, DEPARTMENT OF THE INTERIOR

Ms. DENETT. Yes. Good afternoon. I am Lucy Querques Denett with the Department of the Interior's Minerals Management Service. Our agency is responsible for collecting coal royalties from Federal and Indian lands, and I am here to respond to any technical questions that the committee may have.

The CHAIRMAN. Both of you are technical experts?

Ms. PIERCE. Yes.

The CHAIRMAN. Okay. Have you been prompted to give us any technical advice yet from what you have heard?

Ms. DENETT. No.

The CHAIRMAN. No? All right.

Senator, do you want to talk to the witnesses about anything or ask the ones who have already appeared and talked? Senator Thomas from the State of Wyoming.

Senator THOMAS. Just very briefly.

Wyoming is one of the largest producers of coal.

I guess I would be interested in just a general comment of what do you think are the current, most difficult obstacles to moving toward what you all have talked about to getting coal more used, to be able to do other alternatives, and so on. What are the principal obstacles that exist? Just very briefly.

Mr. LAVIN. Well, I think one thing is we have a system that perpetuates the old coal plants. We have a utility industry that is very risk-averse, and so why are they going to invest in new technology? We need this new technology for coal gasification and sequestration, and if we do not take some of those risks, we are never going to get to that point. That is the only way the future of coal will be essential to this country. Right now we have a system that perpetuates being risk-averse and sticking with these old coal plants.

Mr. HOLDREN. We also lack a market signal to tell the industry that there will ultimately be a price on carbon emissions, and the quicker we get that signal, the quicker we will make the transition to the advanced coal technologies which really are the future of the coal industry in the United States and around the world.

Senator THOMAS. What do you think the signal is now?

Mr. HOLDREN. There is no signal at all on carbon right now. There is no price on carbon. There is no indication of when there will be one in the United States. The recommendation of our National Commission on Energy Policy is that we should announce that there will be a price on carbon starting in the year 2010 and gradually escalating, again, as I mentioned in my remarks, at a pace that does not force the premature retirement of existing coal plants, but which does encourage a transition in new plants to ones that can control carbon emissions.

The CHAIRMAN. What do you mean price on carbon? What does that mean?

Mr. HOLDREN. There would be any number of ways to do it. The simplest would be a carbon tax, a tax on carbon emissions, but nobody likes the T word. So the proposal of the Energy Commission was that you have what is called a cap and trade scheme, where you have a target on carbon emissions based on carbon intensity of the economy, that is, the ratio of carbon emissions to real gross national product, and you allocate permits for that amount of carbon emissions and you put a price on it.

The CHAIRMAN. Yes, we understand.

Senator THOMAS. There are scientists, of course, who do not agree with your analysis.

Mr. HOLDREN. Of course.

The CHAIRMAN. I understand now what you are saying, but I will tell you what I think it is too. Go ahead, Senator.

Senator THOMAS. Jack.

Mr. GERARD. Senator, we obviously do not agree with John and his view on the carbon question.

However, I think it underlies a more fundamental point, and that is the industry needs certainty. Where we are right now under the Clean Air Act and the proposed amendments and other things, we do not know what the rules of the game are. If you talk about a chilling effect to investment and other things, we need to know what the regulatory landscape and the legal landscape is going to look like, 5, 10, 15 years down the road.

We are willing to push hard. We had an unfortunate turn of events yesterday on the multi-emissions Clear Skies legislation. But that is a perfect example of what we need. That bill would cost the industry over $50 billion. Yet the industry supported it because it will provide us the certainty we need to make those costly investments looking into the future to preserve the coal burner.

Senator THOMAS. Mr. Chairman, we are going to have to go vote.

Thank you. Let me just say one other thing, it seems to me, one of the reasons we have had gas are the smaller electric generating units closer to the market. So we are going to have some transmission grid that is going to be able to take this to—to build good, efficient coal plants, they have to be a little larger than 500 megawatts.

The CHAIRMAN. Well, I asked about price. I understood your very direct approach to the trading and the tax. But also, when you have a regulatory scheme in place that is reasonable and implemented over time, that will also be a price. The price will be the cost versus doing business. And you will have to invest in it to get there, and that is the price. That is part of what we are looking at too.

One last before I go, Mr. Hawkins.

Mr. HAWKINS. Well, unusually I would like to agree with Jack Gerard on his point about the value of regulatory certainty. This is an important feature and it is especially important for carbon dioxide. If you are planning a powerplant today, that powerplant is probably not going to be on line for 10 years. If you think that policy may change sometime in the next 15 years, that means that powerplant is only going to be 5 years old when the policy has changed. That is not a situation that is going to encourage people to put $1 billion in a new coal plant. You need to know, and if you

set the rules now, you can give the industry 15 years of lead time. If you wait for 10 years of political pressure to build, then you are not going to have anywhere near that lead time. You are not going to have the business certainty, and you are going to have a lot of coal plants built that are not designed to deal with CO_2.

The CHAIRMAN. I am going to go and Senator Craig is going to take over.

I want to just make this last observation. This committee does not have jurisdiction on the Clear Skies and the regulatory schemes, but we have an energy bill. It is going to get to the shore, I am sure. If the Environment and Public Works Committee does not get one out, we are going to be confronted with the issue sooner or later. So we hope they get one and we hope you continue working on it.

My question has to do with the investment in technology. Everybody says we must invest in the technology and somebody said we should be putting up $400 million a year. I hope you have told us for the record what companies are investing in research and development for new technology. They certainly cannot leave it all up to us.

And secondly, since the research has to be kind of consolidated, not just one research, but you cannot have every company doing the kind of research with the kind of dollars we need in it. I wonder if there has been any scheme heretofore where money would be pooled from the companies to do concerted research, and I would like to kind of know about that. But if you would state for Larry while I am going, and he will take over and finish you and take the next panel.

Mr. BURKE. There is, in fact, a process that has been ongoing for some time with industry and the Government to develop a road map for clean coal technologies and to establish a cost estimate for the ability to follow that road map with specific performance goals. It is the combined Coal Utilization Research Council, Electric Power Research Institute, and the Department of Energy to put this road map together. It estimates a cost of about $10 billion over 20 years to develop technologies that meet specific energy efficiency and performance goals. It includes efficiency as well as criteria pollutants and carbon management goals.

I think the issue with respect to uncertainty and carbon is importantly linked to the availability of technology to deal with carbon emissions on a large scale in contrast to technologies for sulfur and nitrogen control, which have been around and developed and are relatively mature technologies. There is a great deal of uncertainty about the feasibility of carbon control at the kind of scale that would have to be done not only in this country but worldwide if carbon sequestration is in fact the answer to dealing with the carbon issue. The quantities of carbon that would have to be dealt with are very large, and the necessary technology for capture of carbon and principally for the storage or sequestration of carbon is very immature technology.

So the risk associated with any policy that would assume or demand the use of that technology in the future I think is very imprudent at this point. We need to do the research. We need to develop the technology. We need to know how it works and what it

is going to cost before we make significant public policy decisions regarding carbon management.

Senator CRAIG. Jack.

Mr. GERARD. I was just going to comment to Chairman Domenici's question about pooling resources to help in the R&D side of this. Thinking of the history of the clean coal technology program, we spent about $5.2 billion since its inception in the mid-1980's. About $3.5 billion of that has come from the private sector. Now, a lot of those are one-off different R&D efforts, but there has been a tremendous amount of R&D to date from the private sector, in cooperation in the public/private partnership.

The other one now that the President has proposed is the FutureGen initiative. We have gotten together an alliance of coal producers and the major utilities and we are committing and we are in the process now of working with the Department of Energy to commit upwards of $250 million to look at a gasification platform that would help us capture carbon and hopefully sequester carbon, at the same time create a stream of hydrogen. So I think that is one good example where the Government has stepped forward in some of these high-risk ventures and has been willing to bring some money to the table and, in turn, has incentivized the private sector to try to match it where possible.

Senator CRAIG. Jeff, do you have any questions of this crowd?

Senator BINGAMAN. I do not.

Senator CRAIG. Let me venture into the area of tradeable credits. Senator Hagel has introduced legislation that I am supportive of that offers that. I have looked at that and talked about that in the past, offering a clear alternative I think to some legislation that is venturing around out there. Establishing its value downstream in future use and future technology I think is the concern we have. I say that in light of the risk of caps driving a market in the wrong direction without reasonable alternatives and without the technology in place to sustain the current energy base.

Would any of you like to visit about that for a few moments? Tradeable credits, yes. David?

Mr. HAWKINS. Thank you, Senator.

The thing that is very good about the cap and trade mechanism is that it is flexible not just as to compliance but also as to timing. So it is possible for you in the Congress today to adopt a schedule that is far enough in the future in terms of significant constraints that you will create the very market signal that is needed to drive this technology. That is what is going to mobilize private sector resources more than anything else, more than a subsidy program, more than an R&D program. It is a signal that there is a market out there for money to be made.

If you set a schedule now, you can set it 10-15 years in the future. As I said before, if you wait until pressure builds and until the consequences of global warming are so indisputable that all of you will agree that it is here and that we need to react quickly, then that lead time will shrink and you will not have used the time that we have right now to create those market signals and to drive technology improvements.

The technology is there. What it needs is optimization, and you will get that optimization by applying it in real-world commercial-scale operations. You will not get it by doing it in the laboratory.

Senator CRAIG. Does anyone else wish to comment? I am not talking capping. I am talking about building trading at this moment, credits if you will.

Mr. GERARD. Senator, let me make a general point. We obviously do not necessarily agree with David in terms of the cap question. If you look at what is going on in the marketplace now, in the last year there have been 118 proposed coal-fired powerplants. That is more than we have had in the previous decade. So I believe the marketplace is beginning to drive in the direction of coal-fired power, and there is a lot more talk now about IGCC technologies and others that David and others now support in terms of being carbon-capable, et cetera.

But I think there is also enough unknown out there right now that there is the potential, if we go too far with a mandatory cap or anything along those lines, than we are going to send a chilling effect to the marketplace. I see some of my friends from General Electric and others here who are very active in this area now who are looking at that marketplace. I think we need to be very, very careful in any deliberation or signal that you send from the Congress as it relates to carbon for fear that we might chill the current interest, if you will, in moving to cleaner technologies and moving down that road.

Mr. OWENS. And I would agree with Jack. The attitude certainly of the electric power industry is that a voluntary approach is preferable. I do disagree with David. If you assess what has taken place in the industry today, something like 20,000 megawatts are currently on the drawing board. There is a clear commitment in the industry to build baseload coal-fired powerplants. I think if you sought to have a mandatory cap and trade program, that would certainly have a very chilling impact on the industry.

David also talked about the need to mobilize technology, something that we are very, very much in support of, but I certainly do agree with Frank that these technologies are evolving aggressively and it does require significant commitment on the part of industry and the Government for research, development, demonstration, and deployment.

I do not agree with David that these technologies are fully mature today, and that is really where the uncertainty lies.

Mr. HOLDREN. If I could just add a point or two here. Certainly there are some disagreements in emphasis, but I think there is actually more agreement around the table than perhaps is apparent at the moment.

I think we all agree that advanced technologies are crucial to the future of coal in this country and around the world. I think we all agree that we need both more research and development and demonstration to understand exactly what the mix of technologies is going to be and exactly how well they are going to work and exactly what they cost.

When David talked about what we have and what we need, he said we need to optimize those technologies further. The tech-

nologies are out there. Many of them are on the shelf, but they, nonetheless, need further effort at optimization.

The principal problem is that coal-burning powerplants operate for 40 or 50 years. If, over the next 10 or 15 years, we build in the United States another 80 or 100 powerplants, China builds another 300, India builds another 80, and most of them are pulverized coal conventional powerplants, and if in 2015 or 2020 the world has reached the conclusion that carbon capture and control is essential, we are going to have locked in, in those hundreds of pulverized coal plants that are not amenable to retrofit to capture carbon, an immense amount of additional carbon dioxide emissions to the atmosphere that we will wish we were able to affordably avoid.

That means we as a society have a strong interest in accelerating the rate at which those advanced coal technologies that can capture carbon are brought into commercial operation. That is what the National Commission on Energy Policy is recommending this multi-pronged strategy to achieve, not a cap in the sense that we put a limit on carbon dioxide at the current level and say you cannot go any higher than that. We are proposing a market signal with lots of lead time that starts to bend over the growth curve, but does it at a rate that does not end up stranding assets in terms of large numbers of existing powerplants that become uneconomical, does it gradually, but combines the market signal with increased efforts at research and development and demonstration to make sure that the technologies come on line quickly enough to provide us the carbon capture benefits that we need.

The CHAIRMAN. So, David, timing is everything. What kind of timing are you talking about? What is realistic here in your mind?

Mr. HAWKINS. We think that we could get a handle on the global warming problem with a schedule that is not that different than the President's voluntary initiative but that continues. As you know, the President's initiative says slow, stop, and then reverse growth in emissions. He calls for a slowing between now and 2012. If emissions slow more than business as usual between now and 2012, if they plateau in 2012, and then if they begin to decline, we think that that is a schedule that provides lead time and one that would allow us to preserve for our kids a safe climate.

If we go beyond that, we think we are going to wind up missing an opportunity to affect the design of these powerplants that are in the pipeline and so load up the atmosphere that your successors in the Senate will have no choice but to either select a very disruptive program to address this problem or to let the problem go in a manner that is going to have profound risks to the environment, to human health.

The CHAIRMAN. Frank, I think we are going to give you the last word. Please, and then I will turn to Senator Bingaman for a question.

Mr. BURKE. Thank you. I just want to dispute one notion I think that has been laid here, that is, that IGCC or gasification technology is the only pathway to CO_2 control. I think it is a very important distinction because it is at the heart of a lot of what we have heard, that we need to replace these existing plants because they are incompatible with the CO_2-constrained future, which I do not believe is true. There are technologies that can be used to re-

move CO_2 from flue gas at combustion sources. The Department of Energy, as part of this road map that I am talking about, has plans and projects underway to develop CO_2 capture technology for combustion sources and to bring the cost of that down to the point where it would be comparable to what we would expect with IGCC.

I think that has two benefits. First of all, it broadens the scope of technologies or the portfolio of technologies that we can allow the marketplace to choose in building new plants, and secondly, it opens up the possibility for application of these technologies to existing plants not only in this country but throughout the world.

We may be able to replace much of our existing capacity with IGCC over time in this country. But, quite frankly, the Chinese are using 1.5 billion tons of coal a year now. They expect to use 2 billion tons of coal a year by 2020. They expect to use 4 billion tons of coal by 2040. They are not building IGCC's. They are building combustion sources.

So a strong program to develop technology that deals with all sources, combustion, as well as gasification sources, is extremely important, I believe, if there are going to be carbon constraints and we are going to deal with this in an international fashion. It would have to be done if it is going to be meaningful.

Thank you.

Senator CRAIG. Senator Bingaman.

Senator BINGAMAN. I was just going to ask either David or John to comment as to whether the development of sequestration and capture technology is sufficiently mature, whether or not this is a constraint on our ability to meet the deadlines that David just talked about, or if we can do a lot of these IGCC plants and if we do not have a way to deal with the carbon, have we solved the problem?

Mr. HAWKINS. I will start, Senator. I have come to believe, after studying this pretty intensively since 1997, that we do have enough information to regard geologic storage as a safe option. We have got some important experience.

We are, as you know, in your own State injecting CO_2 for enhanced oil recovery operations. Those operations are not being monitored as adequately as we think we need in a future system.

In Wyoming, we have the La Barge natural gas processing plant which is separating CO_2 out from the natural gas there, pipelining it for enhanced oil recovery in Wyoming and Colorado.

In North Dakota, we have a coal gasification plant which is stripping out CO_2 and pipelining it north to Saskatchewan for injection into enhanced oil recovery operations. That one is very well monitored, and the CO_2 is behaving as the experts say it will behave underground.

In addition, we have experience under the seabed off the coast of Norway that has been operating for 6 years and injecting about 1 million tons of CO_2 a year, very carefully monitored, and the experience is proving out the theory.

British Petroleum, BP, has started injecting CO_2 into a large, new natural gas field in Algeria.

Chevron-Texaco has plans to do the same in Australia.

So we are accumulating experience monthly that is dramatically increasing the likelihood that we can do this.

We think we should accelerate that. We think we should initiate some programs without additional delay, but we are confident that these storage systems will be ready when the gasifiers are built.

Mr. HOLDREN. If I can add very briefly to that. As David says, it is happening in a number of places around the world, but at the same time, it is not mature, and that is why we in the National Commission on Energy Policy recommended a substantial infusion of funds to accelerate the development and the demonstration of these approaches so that they will be ready.

I hope Frank is right in his comments about the potential advances in removing CO_2 from flue gases. It will be wonderful if those bear fruit. There are some rather fundamental chemical engineering reasons that it is going to be very difficult to make flue gas removal of carbon dioxide economically competitive with what IGCC can do. We cannot go into those here, but it is a great challenge. At the same time, it would be a great thing if those results bear fruit and we have more than one way to address the carbon dioxide emissions of coal-burning powerplants.

I want to say one word about China. China is building a lot of pulverized coal plants, but they are also building IGCC plants. What the mix is going to be is under continuing review. We, in my group at Harvard, have a cooperative project with the Chinese Ministry of Science and Technology and with the Beijing Clean Coal Technology Institute, and we think that there is a very considerable chance, if the United States takes a forward-leaning role on IGCC, that we will change the trajectory in China as well and increase the chance that they too will build more IGCC plants and fewer pulverized coal plants in the years ahead.

Senator CRAIG. All right. We are going to give you the last word, Jack.

Mr. LAVIN. Sure. I think back to what Mr. Gerard said. I think FutureGen is a key project that the Federal Government needs to move forward on. They have delayed it. Talking about partnerships, the State of Illinois is ready to invest tens of millions of dollars in FutureGen along with private sector companies, the Federal Government, if they can move this forward, and the Department of Energy. It is a key thing. It is sequestration. The State of Illinois is ready to move forward tomorrow on this and we are doing pilot projects later this spring on sequestration. Our State Geological Survey—we have the infrastructure to do it in the State of Illinois, and I think this is an important project. It relates to what everybody is saying here, and we need to move forward with it as soon as possible.

The CHAIRMAN. Thank you very much.

Senator Bunning, did you want to make any observations? The amendment that is up now is the Talent amendment, if you have not voted. Senator Allen, did you vote on that?

Senator ALLEN. Yes, sir.

The CHAIRMAN. So did I. So did you, Lamar. Senator Bunning did also.

Senator BUNNING. Mr. Chairman, since I am coming in in the middle, I am going to just listen for a while and see where we are. I know how important clean coal technology is because of the bill that we had on the floor last year, and I want to see to it that we

do the best we can. I am also very interested in FutureGen because it is very important to Kentucky and surrounding States.

Thank you.

The CHAIRMAN. Thank you very much.

Senator Allen, did you already get to comment or would you like to comment or ask questions now?

Senator ALLEN. No. My sentiments are exactly the same as Senator Bunning's. It is good to see Consol here and thanks for your investment in Virginia.

[Laughter.]

Senator ALEXANDER. I would like to say the same. I regret my absence because we were voting. No subject interests me more right now. I know the same is true with other Senators here because we have talked about it in trying to understand how the Federal Government can properly encourage clean coal technologies, especially coal gasification and eventual carbon capture in an appropriate way. So I will read this and I intend to listen, and I thank you for being here.

The CHAIRMAN. Well, I am going to close this and take the next panel.

But I just want to make an observation for those who are wondering about the next 25 years. It is pretty obvious that America is not going to stop using electricity, and it is equally obvious that we are going to find the energy to develop electricity. For those who are interested in coal playing a role in that expanded growth, it is quite obvious that we have got to do something about the technology of cleanup because the alternative is clearly going to be minimal growth of coal and maximum growth of gas.

You might say which gas. Well it will not be American gas. It will be LNG. That is already predicted by most people that for all the energy coal proponents are exerting, that they will not get there and that LNG will. There are already applications for new terminals.

I am very hopeful that we will find some prudent way to develop the standards or whatever regulatory process we are going to have so that coal can develop the technology and the cleanup in a regular way with the expenditure of dollars by industry and Government in a manner that is understood and is bound up in some kind of reliability and credibility. If not, we will pass an energy bill with new protection for the grid, new reliability standards, new push for investment in the grid and in power, but in an energy bill we cannot solve the problem of what happens to coal if we do not get some standards and rules set up somewhere.

It is not our job. If they send it over to us—I am not asking. They would not. That is another committee, but we would work our way through it, but they have a tough time too. It is 9 to 9 in that committee, I think you know that. I hope they can work something out.

But that is my analysis. I have seen the best we can have and it will be some more coal. 12 years from now, 15, some new nuclear powerplants. In any event, there will be some more coal or some old coal will be going out, but you will not get the maximum amount unless we do something in the area we have been speaking of. I am quite certain of that.

Thank you all very much.

Senator ALLEN. Mr. Chairman?
The CHAIRMAN. Yes.

STATEMENT OF HON. GEORGE ALLEN, U.S. SENATOR FROM VIRGINIA

Senator ALLEN. Mr. Chairman, let me, as a new member of this committee, thank you for all your leadership the last several years on this. It is very important issue from our perspective. The chairman has been more patient than anybody could tolerate in the last few years and just a few votes short on this in the past.

Obviously, we are the Saudi Arabia of the world with coal. Clean coal technology is absolutely essential. The liquefied natural gas and natural gas production does need to increase, but in my view that should be going into tire manufacturing plants, being used in chemical, fertilizer manufacturing, paper plants and not for electricity generation. It would be like using this bottled water to wash your dishes in my view to be using natural gas to generate electricity. It is a great fuel and we need to be, as quickly as possible, going forward with clean coal technology and nuclear, as well as getting the repository issue decided on nuclear. That is where this country will be competitive.

This energy bill, of all the bills that we are going to deal with, will help create more jobs. It will be most meaningful for the security of this country, and it also ultimately affects the competitiveness of our country whether one is a technology company, a manufacturer, no matter what.

So coal, Mr. Chairman, you are exactly right, has to be the key. We are going to have the votes I know with your leadership to drive to get this done this year, and you all will be a key component of it.

I know that Senator Alexander agrees with me that we need to be looking at new technologies so it is burning cleaner, but also using that resource and do not use natural gas on something such generating electricity when we have other better ways of generating it.

Thank you, Mr. Chairman.

The CHAIRMAN. I am going to close by saying the one thing we do not talk enough about—and I urge that you all do it. I urge that you use the numbers too. Figure them out. Our balance of trade—everybody is worrying about it—is dramatically affected by the fact that we import so much energy. A million barrels of oil a day imported per day per year is $18 billion added to our balance of trade. That is pretty good. Conversely, if you save it, you diminish the value of the balance of trade by $18 billion. The same will be for LNG. It is the same thing. You import it. The money is gone. The balance of trade is affected. So those who say it is not very big economic issue, it is a pretty big one.

We thank you very, very much. Now we will take a 2-minute break while we switch, and thank you all again.

[Pause.]

The CHAIRMAN. Mr. Hawkins, we thank you because you are the only major environmental group that responded. So we are giving you double duty. Is that all right?

Mr. HAWKINS. That is fine with me, Senator.

The CHAIRMAN. I am not critical of anybody. I am just stating the truth.

Let us start on this side. Could you tell us what does Clean Energy Systems mean?

Mr. PRONSKE. Clean Energy Systems is a company in California that believes that you can make power without pollution from fossil fuels.

The CHAIRMAN. And how do you say your last name?

Mr. PRONSKE. Pronske.

The CHAIRMAN. All right. Mr. Pronske would you proceed under the rules. They are the same rules now as we have had.

STATEMENT OF KEITH PRONSKE, CLEAN ENERGY SYSTEMS

Mr. PRONSKE. Yes, sir. Thank you, Mr. Chairman and members of the committee.

To the question at hand, we believe the primary challenge to the future use of coal is the need to eliminate all of the adverse environmental impacts from coal combustion. We know how to clean up coal, but with today's technology, the cost of cleanup is simply too high.

To meet this challenge, our company and others are developing technologies that will lead to cost-competitive coal plants with no atmospheric emissions. The future coal plant will not have a smoke stack. It will have coal and air going in and it will have electricity, captured carbon dioxide, and other useful byproducts coming out. But to achieve this goal, there is a need for short-term support for what is known as climate-neutral combustion technology, or zero emissions fossil fuel.

The regulatory challenge is that today in the United States there are no regulatory incentives for zero emissions fossil fuel. Other countries do provide this support and we should follow their lead.

We have made two specific proposals to this end. We suggest an expansion of tax credits to clean energy, as well as renewable energy, and we believe any discussion of portfolio standards should address clean energy such as zero emissions coal plants, as well as renewable energy.

In California, we now operate the world's cleanest natural gas-fired powerplant. Our goal is to have zero emissions from this plant by the end of this year.

The CHAIRMAN. How big is that plant?

Mr. PRONSKE. It is a 5 megawatt plant that we started up actually in December and started making electricity just last week. Our goal is to have that be a zero emissions powerplant by the end of this year, and collectively, we can do the same with powerplants fueled with coal.

Thank you.

The CHAIRMAN. I know you have got a long way to go with that technology. What is the estimated cost?

Mr. PRONSKE. Where we are at today and the dilemma that we have is that anytime you deploy a new technology, it is not going to be the cheapest unit. So today we can make zero emission fossil fuel at about the cost of wind power, certainly lower than solar. Where we want it to go, though, our goal, is coal plants without smoke stacks with the cost of electricity below 4 cents a kilowatt

hour. And we think we could have a coal plant going in a 3- to 5-year time frame at our small demonstration facility.

The CHAIRMAN. Very good.

Let us proceed to Columbia University, Klaus Lackner.

STATEMENT OF KLAUS LACKNER, COLUMBIA UNIVERSITY

Mr. LACKNER. Thank you, Mr. Chairman. Thank you, members of the committee, for this opportunity. I am Klaus Lackner at Columbia University. I am also a longtime scientist.

Coal in the United States is exceedingly plentiful and cheap. Coal produces most of the electricity and coal could, if called upon, replace oil and gas at prices which in my mind surprisingly are not that different from today's.

Unfortunately, environmental concerns will limit the use of coal unless steps are taken to overcome this problem. The most difficult challenge is carbon dioxide. Stabilizing CO_2 in the air is tantamount to stopping emissions regardless of the stabilization level we aim for. So you may buy some time but not much, depending on what the level is. Coal powerplants must capture and dispose of their CO_2.

The good news in my mind is that technology solutions exist and better ones are on the drawing boards. The Zero Emission Coal Alliance some years ago had the first sketch of a powerplant that put a lid on the stack, collected all of the CO_2, and showed how you can get to extremely high efficiency. Not quite that much efficiency you can have today. So these solutions exist. The CO_2 you have you can put underground in enhanced oil recovery and after that inject into deep underground reservoirs. Ultimately you can bind that carbon dioxide chemically in minerals, what I refer to as minerals sequestration. That technology, not quite ready for prime time, would give you unlimited supply and capacity to put the CO_2 away.

Finally, in the end coal would compete well in a world with strong carbon constraints. It would not do so well in a climate of uncertainty and with vague limits. Coal and the environment need not to be in collision. What it will take is a vision that understands the size of the challenge, putting a price on carbon, starting sequestration soon, and provide a climate that fosters innovation and research. After all, we are inventing a brand new technology of carbon management.

And I thank you for your time.

The CHAIRMAN. Thank you very much.

Now we are going to go to FMEA. Bob Koppelmann.

Mr. KOPPELMANN. Koppelmann, yes.

The CHAIRMAN. Please tell us what are you, FMEA?

Mr. KOPPELMANN. Yes. That is the Florida Municipal Electric Association.

The CHAIRMAN. Okay.

STATEMENT OF BOB KOPPELMANN, FLORIDA MUNICIPAL ELECTRIC ASSOCIATION

Mr. KOPPELMANN. Chairman Domenici and members of the committee, thank you for the opportunity to give us a chance to provide our thoughts on the challenges facing future use of coal.

FMEA utilities provide electric service to 2.8 million Floridians, with 60 percent of our energy coming from clean coal generation. We wish to highlight three issues today.

A major barrier to maintaining coal as a key component of our energy mix is basing air quality standards for coal-fired generation on the environmental performance of natural gas. These energy-neutral standards penalize coal to the point of forcing fuel switching to natural gas and constitutes a major challenge to building new coal-fired plants.

Second, the Department of the Interior's Federal land managers have developed visibility assessment criteria that are so stringent that proposed new coal-fired plants, locating within 100 to 200 kilometers of a class 1 area, are not able to pass the visibility criteria, even after employing best available control technology, inhibiting the construction of even natural gas plants, and in the West, they are holding up permitting for oil and gas drilling. These criteria should be reviewed and revised to reflect the 50 to 70 percent emission reductions that will occur due to the adoption of the CARE rule.

Our final point is the need to involve multi agencies in assessing both environmental and health effects research, bringing valuable and differing perspectives to answering critical environmental questions. For example, for 10 years, EPA has focused on the size and quantity of particles and not the chemical composition. The Department of Energy saw a hole in this research and has funded PM Speciation Research at their national energy technology laboratory. The OMB has indicated in the 2006 budget that they will cut the research in this area. We believe this is exactly the wrong the answer, and we believe that DOE must be involved in speciation and mercury research.

In conclusion, I would like to emphasize that the environmental standards for coal-fired generation must be based on the best performance possible by coal-fired generation and not that of gas-fired generation.

Thank you.

The CHAIRMAN. Thank you very much.

Bret Clayton, nice to have you here.

STATEMENT OF BRET CLAYTON, PRESIDENT AND CEO, KENNECOTT ENERGY

Mr. CLAYTON. Nice to be here. Thank you for inviting me Mr. Chairman. I am Bret Clayton, president and CEO of Kennecott Energy. Kennecott Energy is one of the largest coal producers in the United States. We have operations in Colorado, Montana, as well as we are headquartered and have operations in Wyoming. Last year we produced about 130 million tons of coal that was converted into approximately 6 percent of the Nation's electricity supply.

Today I would like to focus my comments on the development of technologies, technologies that will support the continued improvement in the environmental performance of coal, and thereby ensure coal as a long-term secure and affordable energy source as part of a diverse portfolio of energy sources.

If the United States is to maximize its extensive coal reserves, continued environmental performance improvement will be re-

quired, and we believe that these efforts will need to be expanded to include cuts in CO_2 emissions.

In the short term, however, we believe the United States needs to focus on continuing improvement in conventional pollutants. We believe that reforming the Clean Air Act is an important part of that and that this will help accomplish more rapid and in a more cost effective manner these emissions reductions in existing law. Kennecott Energy also believes that market-based mechanisms like trade and cap programs are the best and most effective ways to reduce emissions.

However, our long-term efforts need to focus on near-zero emissions technologies. Although these efforts will not be felt immediately, we believe that action is required now and that we cannot delay any longer taking action or these technologies will not be available when they are required.

Carbon capture and storage is an important one that has been identified. I think we are all familiar with that and its aspects, so I will not go into the details.

But we believe that a good example of the partnerships that we need to put together, FutureGen is one of them, and Kennecott Energy is a founding member of the FutureGen Alliance and supports the President's proposed budget that fully funds this program.

While FutureGen is a good project and worthwhile on its own, we do not believe it is enough. The ultimate viability of this technology will require many more large scale demonstrations, and we believe that it is, therefore, essential that the DOE act in a leading role not only domestically but in international forums in pushing this forward. Public acceptance of this technology should not be—this is an issue that I think we should not dismiss as it is going to be a big issue that we will have to make sure that we have the public——

The CHAIRMAN. Will you take your last two sentences and state them over again?

Mr. CLAYTON. Yes. FutureGen is an important project, but in itself it is not enough. We need to make sure that we have multiple large-scale demonstrations that will help overcome public issues that the public might have with this technology and demonstrate the viability and the long-term nature and safety of carbon capture and storage. We think that this needs to be done not only domestically, but needs to be an international effort to do so.

I think my time is up. I will just say there are many ways to do this but we believe that action needs to be started now in order to address these issues in an appropriate time frame.

The CHAIRMAN. All right.

Now, you are both technical experts here to help us. Is that correct?

Mr. CRAYNON. That is correct, Mr. Chairman.

The CHAIRMAN. So far we have not asked you. So if you will just sit there, maybe we will.

We are coming over here now to IMCC, Greg Conrad.

STATEMENT OF GREG CONRAD, ON BEHALF OF THE INTERSTATE MINING COMPACT COMMISSION AND THE NATIONAL ASSOCIATION OF ABANDONED MINE LAND PROGRAMS

Mr. CONRAD. Thank you, Mr. Chairman. I am here representing the Interstate Mining Compact Commission and the National Association of Abandoned Mine Land Programs. Together these two organizations represent all of the States who exercise primary regulatory authority for coal mining operations within their borders under the Surface Mining Control and Reclamation Act.

As we focus on the future of coal and the role it will play in our Nation's overall energy picture, the States continue our efforts to address the impacts from both current and future coal operations on the environment and on public health and safety. In this regard, we strive to operate high quality, comprehensive programs that will ensure that we achieve the necessary balance between our need for coal as a critical energy resource and the protection of the environment.

We also remain focused on the legacy of past coal mining operations and the impact of abandoned and inactive mines on the health and safety of our citizens. We are advocating, for your serious consideration, two proposals that address these matters: one, the reauthorization of the authority to collect fees from coal operators that support the Abandoned Mine Land Reclamation Fund and adequate funding for State regulatory programs. As you know, authority to collect fees under title IV of SMCRA will expire on June 30 of this year, and so we are under the gun to resolve this critical issue so that the thousands of high priority AML sites that threaten coalfield citizens will be remediated. We urge the committee and the Congress to work again with us to accomplish this legislative priority.

As we consider the potential for increased coal production and use, I want to highlight the importance of adequate annual funding for State regulatory programs. It is these programs that address the environmental impacts associated with coal production through permit approval and effective inspection and enforcement. When we commit the resources necessary to support strong and effective State programs, we can achieve the balance we desire between developing our Nation's most abundant energy resource while protecting our citizens and the environment.

Thank you.

The CHAIRMAN. Thank you very much.

I am very sorry. I missed what IMCC is. I apologize.

Mr. CONRAD. It is a State government organization representing the agencies that regulate the mining industry.

The CHAIRMAN. Thank you very much.

Mr. Habicht.

STATEMENT OF HANK HABICHT, COMMISSIONER, NATIONAL COMMISSION ON ENERGY POLICY

Mr. HABICHT. Thank you, Mr. Chairman, Senators. I am Hank Habicht and I am appearing today as a commissioner of the National Commission on Energy Policy.

The commission conducted thousands of pages of studies and analyses over the last 3 years focusing on the economic, security,

and environmental challenges across our entire energy system. Among many conclusions, we concluded that coal has been and must continue to be an important component of our national energy system going forward.

Now, on the environmental issues, coal does face three categories we found of environmental challenges. First are the conventional air pollutants that come from combustion. Second, the upstream impacts we just heard a bit about on land and ecosystems from coal mining practices, and then third, carbon emissions from coal.

We addressed these in turn. After a lot of analysis, a lot of debate, a lot of back and forth, we came up with a comprehensive set of recommendations looking across the energy system.

With regard to coal, we concluded that all these environmental issues are addressable through the kind of technologies, management practices, and market-based trading systems that we have experience with in this country and that can be implemented, including a market-based carbon emission permit system that Professor Holdren described in the last panel.

I would add that we spent a lot of time also understanding an issue that was talked about in the first panel, which is the critical need for certainty for investment. These are long-term investments and we need as much regulatory certainty as possible to stimulate investment.

Just briefly, with regard to conventional pollutants, we strongly concluded that there is a need for legislation that provides for multi-pollutant controls and a firm, predictable schedule of emission reductions consistent with the environmental requirements and system reliability and also that uses market-based approaches. So that is conventional pollutants.

With regard to upstream impacts, we commissioned a number of studies, and I have had some experience on the enforcement side of this area over the years. We believe that those impacts can be addressed and are in the process of being addressed.

Third, with regard to carbon impacts of coal, we have heard a bit about a number of different ways to address this. We believe that a phased intensity-based carbon emission permit system can address this issue if it is coupled with a reasonably aggressive public/private investment program we believe. And we recommend a public investment in 10 gigawatts of early installation of IGCC capacity and a comparable amount of investment in carbon capture and sequestration technology. Very important. And our recommendations are revenue-neutral which we can get into.

But just in the interest of time, I would say that we have experience with national market-based trading programs. We believe that the market signals and the time frames of this trading program can stimulate the kind of investment on the time frames we need in IGCC and sequestration on their own tracks but on coordinated tracks because IGCC that is carbon-capture-ready is a way to move forward with this technology. We believe that by moving forward in this way, coal can continue to play a very important role in our energy future.

Thank you for you time.

The CHAIRMAN. Thank you very much.

Now, Mr. Hawkins.

STATEMENT OF DAVID HAWKINS, NATURAL RESOURCES DEFENSE COUNCIL

Mr. HAWKINS. Thank you, Mr. Chairman.

Coal has many impacts on the environment. I will concentrate on global warming.

Global warming is a different kind of problem, first, because of the tremendous damage that destabilizing the climate will produce, and second, because the threat increases the longer we continue to emit CO_2 even at current levels. Two features of global warming require action now, as Bret Clayton has said.

First, CO_2, once emitted, stays in the air for more than 100 years. So each year's added emissions increase the amount of global warming.

Second, the largest CO_2 emission sources have very long lives. New coal plants are likely to operate for 60 years or more, and with today's designs, those plants are likely to emit large amounts of CO_2 for their entire lives which will lock us into additional global warming. Let me give you just some detail.

The coal plants that are forecasted to be built around the next 25 years will have cumulative CO_2 emissions of over 550 billion tons. That is a staggering number. That is half the total amount of total CO_2 that has been emitted from all energy combustion since the beginning of the Industrial Revolution 250 years ago. And we are going to commit ourselves to that additional loading with investments that are on the drawing boards in the next 25 years globally.

As Klaus Lackner said, we cannot secure a stable climate and use coal unless coal's CO_2 is captured. So we should start now to deploy coal plants that can capture CO_2 for safe geologic storage.

If the United States takes the lead on this, it will speed the day that all countries use this technology. That is essential regardless of what we later decide is a safe target for greenhouse gas concentrations.

So a new law that combines a schedule for binding limits on CO_2 with substantial financial incentives for deployment of coal plants with CO_2 capture will provide multiple benefits. It will pave the way for a safe climate. It will provide for more secure energy supplies, as the chairman has noted, and it will create new global markets for American businesses. We should not put off this smart investment any longer.

Thank you.

The CHAIRMAN. Thank you very much.

Now, Sara Kendall from the Western Organization of Resource Councils.

STATEMENT OF SARA KENDALL, DIRECTOR, WESTERN ORGANIZATION OF RESOURCE COUNCILS

Ms. KENDALL. Thank you. I am the Washington, D.C. Director for WORC. WORC has worked for over 30 years to protect our members and others who live near coal mines and powerplants from the impacts these facilities have on public health, air, land, and water.

As the Nation looks increasingly to coal to feed its appetite for inexpensive power, we think one must ask how inexpensive is coal

really. Coal loses some of its luster when its full costs are considered.

There are five challenges that we believe must be addressed to ensure that the true costs of coal mining and power generation are not passed off onto people and the environment.

First, we urge the committee to aggressively address the emissions issues being discussed, but until we have proven technology for zero emission coal plants, we believe that we are better off meeting our need for additional power through efficiency and renewables when and wherever possible rather than building over 100 new coal-fired powerplants across the country as is currently proposed.

Secondly, we urgently need to clean up abandoned coal mine sites and cannot afford to interrupt, underfund, or end the abandoned mine land reclamation program.

Third, we are concerned that the amount of mined land that has been reclaimed but is still under bond is growing each year. We believe that Congress should make it a priority to ensure that mined land is not only reclaimed in a timely fashion but that companies apply for final bond release, thereby demonstrating to the public that they have returned agricultural lands to productivity and also replaced water supplies affected by mining.

Fourth, we believe that continued public funding for clean coal technologies should be reconsidered, especially at this time of budget shortfalls and given DOE's program has been plagued by numerous failed attempts to build clean coal plants and also that waste and mismanagement have been documented repeatedly in the program.

And then finally, last year's energy bill would have removed important protections that encourage a fair return to taxpayers for the use of the public's coal and also ensure diligent development of that coal. We recognize that some of the coal leasing program's provisions may deserve review and we are willing to work with the committee on appropriate updates, but we urge you not to make the sweeping changes of the sort that were in last year's bill.

Thank you.

The CHAIRMAN. Thank you very much.

Now, we have one more panel. It looks like we are going to be okay for those who have budget votes because we are off till 5:15. That does not mean Senator Bingaman and Senator Thomas have time. We have till 5:15 at least for those on the budget. Well, when the floor happens, it will happen.

Senator Bingaman, would you like to proceed first?

Senator BINGAMAN. Sure. Thank you very much, Mr. Chairman. Thank you all for your testimony.

Mr. Habicht, let me ask you a question on your National Commission on Energy Policy. Your proposal, as I understand it, contains this safety valve so that the cost to industry of complying with the caps that you are talking about is somewhat limited in that you can buy credits. Could you explain to us how that would work and how you see that as an improvement on the other types of proposals that have been put forward to deal with the carbon issue?

Mr. HABICHT. Certainly, Senator, I will be happy to.

We spent a lot of time looking at a range of options in dealing with the carbon issue. We recognize that there is a lot of very strong and deep-seated concern about moving to a mandatory trading system, and we took that very seriously.

At the same time, we looked at the evidence with regard to climate change, with what is happening around the world and just concluded that from a risk management standpoint, it was important for the country, particularly with our ability to implement market-based trading systems, to move into a trading-based system to provide for certainty and predictability.

But because of the concerns about economic impacts, as well as international competitive impacts, we integrated into this proposal a number of features that we thought both created a time frame and a sense of predictability with regard to impacts, as well as safety valves, so that the impacts would not be unduly dire for the economy.

Having said that, we undertook an intensity-based approach, looking for 2.4 percent reductions in intensity each year over a 10-year period. The $7 per metric ton of carbon safety valve was that in case the cost of control exceeds $7 a ton, at least in this initial period, that the Government would purchase emission credits for $7 a ton to offset any reductions that would have cost more than that.

We also have a provision that every 5 years, we recommend that the Congress would look at what other countries around the world are doing, including the countries that have not signed Kyoto, the large, developing countries, to determine are other countries undertaking significant commitments with regard to carbon. If in fact that is not the case, then we would recommend that the country reexamine our carbon strategy because there needs to be parallel action around the world.

But basically in a nutshell—and I can certainly go into it more, but in the interest of time—the idea was to have a phased program that would slow and ultimately reduce emissions growth in a way that should not cause concern about economic impacts and would not have an undue impact on retirement of existing capacity. Under this proposal, actually coal consumption increases by some 16 percent by 2020.

Senator BINGAMAN. Let me just also ask David Hawkins if he would comment on this set of recommendations by this National Commission on Energy Policy. Do you think this would be a step forward, or do you think that we would be better off not proceeding this way?

Mr. HAWKINS. We applaud the commission's recommendation for a mandatory limit on emissions. We think that is critical and we agree with their view that the sooner we get this started, the sooner we get established, the better off we will be.

We do have some concerns about the safety valve, particularly the impact on technology innovation. Let me explain very briefly. If you are an entrepreneur and you have a technology that you think is close to the safety valve, in terms of its price, but you are not absolutely certain you can meet it, you may decide not to pursue that technology unless you are clear that you can meet it because if you can meet it, you have a market, and if you cannot

meet it, if you are just 10 percent over the safety valve, you do not have a market. So you may drop things and it may deter technology innovation.

So we would prefer to see a different way of addressing the price concerns. We think there are lots of ones to explore and we would like to work on that. But we do agree with the commission's recommendation that the time has arrived for a binding limit.

Senator BINGAMAN. Thank you, Mr. Chairman.

The CHAIRMAN. I am going to yield, but I just wanted to ask Mr. Hawkins. You mentioned how much new carbon dioxide is going to be added over the next whatever years. How many did you say? 50?

Mr. HAWKINS. Between now and 2030, Senator, 25 years.

The CHAIRMAN. How much did you say?

Mr. HAWKINS. Globally it is 550 billion tons of CO_2 from new coal capacity.

The CHAIRMAN. How much of that is American?

Mr. HAWKINS. The American capacity is, forecast by EIA, to be about 100,000 megawatts out of a total of 1,400 megawatts. So about 8 percent.

The CHAIRMAN. So 8 percent of that 550 billion is American.

Mr. HAWKINS. That is correct.

The CHAIRMAN. So even if America did its job, 95 percent would not.

Mr. HAWKINS. The fact that the rest of the world is exploding with coal is precisely the reason why it is so important for America to lead. Senator Domenici, as one of the authors of the Clean Air Act, you know what has worked. We adopted tight auto emission standards in 1970. China is following. We took lead out of gasoline in the 1970's. China is following. We required scrubbers to go on powerplants. China is putting scrubbers on powerplants now. If we lead the way, we will get other countries to get there faster, and it is critical that we do that because other countries are growing more rapidly than we are in terms of emissions.

The CHAIRMAN. Well, I agree wholeheartedly, unless in getting there, by doing it ourselves, waiting for them to catch up, we face an inordinate economic burden on ourselves. Of course, that is what the contention is. You and your people do not believe it, but those on the other side do believe it, that it will cause this extraordinary burden.

Let me ask one further one on technology development, of you, Hank. I have trouble with your last name. Tell me your last name again.

Mr. HABICHT. It is Habicht. I have heard it pronounced 1,000 different ways. Do not worry.

The CHAIRMAN. Just like a bad habit?

Mr. HABICHT. Yes, a good one.

[Laughter.]

The CHAIRMAN. Did you say that you thought you wanted to pursue development of the new technology all the way to zero because entrepreneurs might stop short of it, or was that Mr. Hawkins who said that? That was not you?

Mr. HABICHT. No, that was not.

The CHAIRMAN. Okay, well, that is Mr. Hawkins again. I do not think that is right. I think that is right if in fact you are not going

to place an inordinate economic burden on getting there in order to get a small group of entrepreneurs to do a little, tiny bit. It seems to me you do not have to set the standard at the ultimate to get tremendous innovation by way of change. I would like you to address that because that sounds more rational to me.

Mr. HAWKINS. Certainly, Mr. Chairman. I was not arguing that we should set the emission limits at zero. The emission limits need to be gradual, and if we start now, they can be gradual.

I was suggesting that an arbitrary safety valve, especially one set at a low level, may deter technology innovation. For example, the commission's proposal of $7 a ton of CO_2 is actually below the level that some power companies are using in their business planning today. Pacific Corp. is using $8 a ton of CO_2 for making resource selections. Idaho Power is using $12 a ton of CO_2 for making resource selections. So it is very easy to get that number wrong and it is very easy to set it so low that it does not stimulate technology innovation. So we are not arguing against considerations of cost. We are just saying that we can find more sophisticated ways of doing it.

The CHAIRMAN. You will acknowledge too that in the quest for technology, we have made some mistakes in using best available control technology as a definition in other laws, because when you get to a point where you do not need it any better, best available control technology says you can even do better than the best. And then you have to go out and do it. That has put a big burden in some of the areas of cleanup. Now, that does not apply directly but it has a little bit——

Mr. HAWKINS. I would just say, Mr. Chairman, that today EPA issued a rule for cleaning up sulfur and nitrogen in the Eastern United States. It is using technology that was produced by the best available control technology program.

The CHAIRMAN. Right. I understand.

Dr. Lackner, let me say you wanted to speak to this issue. I just want to ask you, before you talk, in your opinion, if we had enough resources and put the right people in charge of a couple of demonstration programs that are large enough, how long would it take and how much money would it take to get to that point where we had coal cleanup that was whatever you want to set as a standard, zero clean, or whatever that very wonderful standard is.

Mr. LACKNER. Let me start out saying you cannot start with a zero emission limit. You have to phase things in in some way gradually, and putting a price on carbon would precisely do that. So I am in full agreement with this approach.

If you ask me, can you build technology, could new powerplants be built today which collect all of the CO_2 or nearly all of the CO_2, the answer is yes. If you go to Scandinavia, people there talk zero. There are people talking about powerplants which run on oxygen, collect their own CO_2 to dilute that oxygen, and then have a concentrated stream, and nearly all of that CO_2, maybe 90 percent of it, is collected. So the technology to do that in simple forms exists. What you hear over here can, in principle, do that. The IGCC plants can, in principle, do that.

Now, today this will cost money. And the longer we do that and the more experience we get, the cheaper it will get. So we need to find a way of distributing these costs, and it will not be cheap.

If you think about it for a moment, a single gigawatt powerplant is a billion dollar investment to begin with. And you probably have to do this multiple times before you really get that right. So this is a decade of effort which gradually will get better. On the other hand, we do not have that much time to waste, and therefore we need to get going. I see the price as one elegant way of putting the economic incentive in it.

And do not forget, at the end of the day, the by far cheapest solution is to ignore the problem. So as a result, unless there is an economic incentive or a regulatory demand which says you must deal with this problem up to some level, you cannot avoid dealing with it.

The CHAIRMAN. Anybody else up here? Yes, please, Senator Bunning.

Senator BUNNING. Thank you.

I would like to ask is it Bret Clayton?

Mr. CLAYTON. Yes.

Senator BUNNING. Kennecott, 6 percent of all the power in the United States, coal-fired power?

Mr. CLAYTON. Electricity, 6 percent of the electricity.

Senator BUNNING. That is all done with Wyoming coal?

Mr. CLAYTON. A little bit of Colorado and a little bit of Montana.

Senator BUNNING. How many dollars do you think it would take to get beyond where we are now and to do what Klaus just suggested? How many dollars?

Mr. CLAYTON. I guess that is a very hard question to answer. What I would say is I heard in testimony earlier today that passage of Clear Skies would have brought in about $50 billion of investment over a period of time to achieve those reductions. So I mean, to achieve what we are talking about, we are talking about industry investment not of billions but tens of billions. And to get to zero emissions, including capture and storage, you are probably talking 100.

Senator BUNNING. $100 billion.

Mr. CLAYTON. But that is why it is so important as we spoke—I think your earlier panel as well spoke about clarity, clarity of regulation. These are plants that get on the planning board, they do not get built for 10 years, and then they operate for 50 or 60 years. For industry to make investments of tens and hundreds of billions of dollars, we need certainty to know how we are going to make a return on that. And the longer and longer we put that certainty off, in our view we lose time in pushing technologies forward and in developing them that will allow us to actually address these issues.

Senator BUNNING. We are really familiar with that in dealing with refineries and nuclear power. Once they start the planning for one of those things, the agencies that control the regulations and rules alter as they go down the path. I can just speak of experience of one nuclear powerplant that was being built outside of Cincinnati, Ohio, and by the time they got ready to open the plant, they audited it and said it was not going to work. It had spent $3.5

billion building the plant, and they converted it to coal-fired generation.

We have to have certainty before private industry is going to make the investments that are necessary, but in the coal and energy program that was in the Congress last year, we had approximately $4 billion either in direct subsidy or tax credits. Now, that is a start.

Mr. CLAYTON. And I would say those are the types of levels that we need to be funding to move these along.

And we need to be sure we are encouraging other governments. We have a sister company in Australia that is working very hard in that area of the world to make sure that we are not the only government and only Nation funding this. This is an international problem and requires an international——

Senator BUNNING. Everybody over here on this side of the fence—both sides—knows that we have not built a refinery in over 25 to 30 years and the reasons we have not done it. The same thing with nuclear power. And we have to have the same certification and positive attitude when we are going to do clean coal and clean coal technologies so that we can get past the emissions levels that are necessary.

Mr. CLAYTON. I guess that is why I would say we would prefer to see this done legislatively rather than rulemaking because it provides greater clarity.

Senator BUNNING. Well, if somebody can read the legislation correctly, then the rules come out pretty well. Usually we have a lot of people making the rules that do not read the legislation too correctly.

The CHAIRMAN. Sometimes we write the legislation so fuzzy that they cannot help doing that.

Senator BUNNING. That is absolutely true, Pete.

The CHAIRMAN. Senator Alexander.

Senator ALEXANDER. I want to follow up Mr. Habicht's comment. I am interested specifically in what we ought to do here. What can Congress appropriately do that is based on good science and making the minimum interference with the marketplace to encourage these objectives which there is a broad consensus about. We are all tantalized really by these prospects, but we do not want to be clumsy about it.

You suggested if I understand, 10 gigawatts of IGCC and then whatever was spent on that, spend about the same on carbon recapture. That is 10,000 megawatts. That is four or five, six plants. Was that what that would be? And to do what? To provide some sort of floor or safety valve? Exactly what would we do to encourage the creation of 10 gigawatts worth of IGCC?

Mr. HABICHT. It is a great question, Senator. And to Senator Bunning's point, what we see—and the challenge in policy making, when you have a technology like IGCC—and we are not saying that IGCC is the only way to get to clean coal, but it certainly is one that has progressed to the point where we see its promise. We see that there are some costs and other issues that are keeping it kind of in the starting blocks.

So we looked at what kind of legislative clarity through policy plus some Federal participation in getting demonstration plants

going would break the logjam and open the door to this kind of investment. We thought the signals that would be sent through—so it is a combined recommendation of some clarity with regard to carbon in the economy and a trading system for carbon, plus this demonstration program.

Senator ALEXANDER. But you do not want the Government to build plants.

Mr. HABICHT. The Government would just provide loan guarantees or some kind of investment——

Senator ALEXANDER. Well, that is what I am getting to. How much loan guarantee?

Mr. HABICHT. Well, as little as possible, frankly, to move it forward. The best way to do these programs is through a competitive process where the private sector comes in and the organization that has the best proposal for the least Federal investment would move forward. The idea is just for enough Federal investment to move some demonstration projects onto the ground, into operation, have them carbon capture and sequestration ready, and then also invest in the sequestration side.

Senator ALEXANDER. But the proper question for us is what amount of Federal investment would it take to get 10,000 megawatts, 10 gigawatts, of IGCC up and going.

Mr. HABICHT. Our estimate was that would be about $4 billion and $3 billion or so would be for the sequestration research. This was based on a lot of analysis that we can provide to the committee that we think would move the process forward. There is always a question of how heavy a government hand needs to be imposed on the marketplace to take a new technology and get it through what is sometimes called the valley of death into the marketplace. And we do not think that very much is needed, as long as there is a clear set of signals that really sort of show what the path forward over the next 15 years or so is with regard to policy and investment.

Senator ALEXANDER. Thank you.

The CHAIRMAN. Well, we are in a real bind. The only way to get out of it is to tell the two panels that have not appeared yet that we are not going to be able to hear from you. We apologize profusely, but we have seven votes on the Senate floor starting shortly. The budget members who are here have seven or eight votes starting about 2 minutes from now. So we will do the best we can to use the information and we humbly apologize. Maybe we should have tried fewer panels.

We want to thank Jeff Jarrett, Director of the Office of Surface Mining. He is here and spent the afternoon to be our helper.

I would just suggest to those who have such an interest in setting these high standards, Mr. Hawkins, what happens is, if you set them with that ideal notion that you have given us, so that we will develop the technology for the world and in the meantime we set it as stringent as possible, maybe approaching zero, you do not get anything because the opposition has economic evaluations that say how expensive it is, that they cannot afford it. And they will win. What we need to do is find some way to get where you want to get but to get there in a way that we can show will be a reasonable cost economically.

What is reasonable to those who theoretically say it is such a wonderful thing that we ought to do it, and do it for the world, the answer is going to be what I just asked you. Are you telling us that for 5 percent of the production of this pollutant which America produces, we are going to take this kind of economic gamble? I understand that it is not a gamble totally. It is also some great leadership. Right? And maybe it changes the world.

But I think therein lies the problem. You end up saying, as an environmentalist, we want out of this game. You are not going all the way, and we end up having to say, well, the industry and the consumer is telling us that is going to be way too expensive and we are not going to accomplish what you want. So we need something in the middle. So I urge that we somehow find out how to do this.

My last observation is I heard our President tell me the other day to my ear, do not put anything in this energy bill that gives any subsidies to the oil industry or the gas industry because they make plenty of money these days. Now, I know you people who think the President is something different do not believe he said that, but he did. And we are looking at the bill and saying, well, we better take out some of the stuff the House put in. We do not want it.

But I have a feeling every industry that is involved today, coal and otherwise, with the price going up like that, we ought to find a way for the industry to pay for what we need. The problem is, we do not know how to focus your money on projects of this magnitude because you are 20 companies or 50. So you look at us to do it. If we could find a way to make your money come into a pot and we would match it and then get on with these projects, we might have much more to sell. I do not know how to do that yet.

We are going to reschedule you all, the people that we could not hear from. Thank you very much. Thanks to all of you.

[Whereupon, at 4:25 p.m., the symposium was recessed, to be reconvened on April 21, 2005.]

COAL CONFERENCE

THURSDAY, APRIL 21, 2005

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The conference was convened at 3:09 p.m., in room SD–366, Dirksen Senate Office Building, Hon. Lamar Alexander presiding.

OPENING STATEMENT OF HON. LAMAR ALEXANDER, U.S. SENATOR FROM TENNESSEE

Senator ALEXANDER. We thank you for coming. Many of you were here before when, because of an uncertain Senate schedule, we did not get everything done, and so we have invited you back because of our interest in what you are doing.

Senator Bingaman is the ranking member of our full committee and Senator Domenici has asked me to chair this. We have, as is often the case in the U.S. Senate, we have a series of votes that we will require us to leave at 4 o'clock. I am not sure that we will be able to get back for another hour or hour and a half after that because of a series of four votes.

So what I am going to try to do, with Senator Bingaman's advice, is to get as much of the testimony of both panels in by 4 o'clock so that we do not keep you unnecessarily, which means keeping the senatorial conversation abbreviated so that we can hear as much of you as possible.

We were very pleased with what we heard before. We received more than 50 submittals. The purpose of this is to continue our discussion of the future of coal. We are doing that at a very timely—at an important time, because not only is the price of energy, including coal, going so high that it is threatening our blue collar workers, our farmers, our homeowners, and our standard of living—we are about to write up an energy bill in the next few weeks that we hope will be aggressive on a number of fronts and we need your best advice about how to do that.

You know the issues. I do not need to take more of the time expressing them. The way we did before and the way I would ask that we do today is that if you will give us your written testimony, which most of you have, we will consider it. We would like to start on the left when we start and ask each of you to take 2 minutes, introduce yourself, say who you are. Then Senator Bingaman and I will ask a few questions and then we will invite the next panel to come up, so we can be sure and get your written statement and your 2-minute statement in before the votes start.

Let me thank you again for coming and being understanding of the Senate schedule. Senator Bingaman.

STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR FROM NEW MEXICO

Senator BINGAMAN. Mr. Chairman, I will defer to the witnesses. I appreciate them being here and I appreciate you chairing the continuation of this forum.

Senator ALEXANDER. Thank you.

Why do we not start with you, Mr. Palmer, and we will go right around.

STATEMENT OF FREDRICK PALMER, EXECUTIVE VICE PRESIDENT, LEGAL AND EXTERNAL AFFAIRS, PEABODY ENERGY, ON BEHALF OF THE COAL-BASED GENERATION STAKEHOLDERS GROUP

Mr. PALMER. Thank you, sir.

I am Fred Palmer of Peabody Energy. We are the world's largest coal company. We control close to 10 billion tons of coal on the North American continent and abroad and we do close to—over 200 million tons of coal production a year.

It is an honor to appear before the committee and I am appearing today on behalf of the Coal-Based Generators Stakeholders Group. CBGS is a diverse group of investor-owned utilities, rural electric coops, public power companies, coal producers, coal-hauling railroads, and the associations that represent them. Our member companies are represented at the CEO level and it is co-chaired by Peabody Energy's CEO Earl Engelhart and Duke Power CEO Ruth Shaw.

Coal is the fuel of the future. As demand for electricity increases, electricity from coal will increase accordingly. Full utilization of the existing coal fleet in the United States will play a critical role in meeting our Nation's electricity supply. Required new capacity will be built using a suite of advanced technologies that range from advanced pulverized coal to integrated gasification systems, resulting in a continuing decline in emission of criteria pollutants even as coal demand increases by some estimates up to 500 million tons over the next 20 years.

CBGS has agreed on a vision for achieving ultra-low emissions from coal-fueled electric generation and we have submitted that document for the record, Mr. Chairman, and I would ask that the committee give it careful consideration.

Imported natural gas for electricity generation is no solution to America's obvious energy and electricity needs, as the chair has identified. Liquefied natural gas is priced off of imported oil and it is produced in many of the same areas of the world. I have been doing this long enough to have been here during Project Energy Independence and today it is eerie how similar the circumstances are to the 1970's and 1980's. Dr. Jim Schlesinger is on our board of directors, who was the first Secretary of Energy.

We believe that the best solution is to focus on an ever-increasing use of our vast coal reserves to generate electricity cleanly and economically, and to do so we believe we need passage of Clear Skies and an energy bill.

With respect to climate change policy, that does get a lot of attention here and elsewhere, we believe that the President's technology-based approach is sound and we believe Future Gen needs to be fully funded. I also would like to endorse the modified S. 388 introduced by Senator Hagel and which the chair is co-sponsoring. We think that is a sound approach and we identify with that.

Artificial restraints on CO_2 emissions must be avoided since a cap on carbon will chill the investment needed in new coal-based generation. Proposals such as those advanced by the National Energy Policy Commission, McCain-Lieberman, or Carper-Jeffords are the wrong path in our view for our country to follow. We need an energy bill that encourages energy supply. An energy bill containing carbon taxes or caps, whether hard, soft, or virtual, will be an energy rationing bill, not a supply bill, causing even greater increases in the——

Senator ALEXANDER. Mr. Palmer, we are well over the 2 minutes.

Mr. PALMER [continuing]. In the cost of natural gas, oil, and gasoline, and a reduced quality of life for the American people.

Thank you, sir.

Senator ALEXANDER. Thank you very much.

We are interested in everything you think you have to say and we will read carefully your comments. But so that everybody will have a chance to say their piece, if you will maybe give us your major points. We have a little clock over there that will ring after 2 minutes.

Mr. Yamagata.

STATEMENT OF BEN YAMAGATA, EXECUTIVE DIRECTOR, COAL UTILIZATION RESEARCH COUNCIL

Mr. YAMAGATA. Mr. Chairman, members of the committee, thank you for having me here.

Four years ago, the Electric Power Research Institute, the Department of Energy, and the Coal Utilization Research Council agreed upon goals and objectives for clean coal technology development that are embodied in the Clean Coal Technology Road Map. If we follow the goals and objectives of the road map, by the year 2020 we expect to have a series of options available to the Nation that produce very clean energy from coal in a very cost effective and efficient manner, and we recommend and commend the road map to you as you are looking at and divining a new clean coal—rather, a new energy bill.

I have two points that I would like to make to you today. First of all, if you look at technology development, the curve for technology development is very simple. There is a research and development phase, there is a demonstration phase, and really there is a deployment phase. That phase of deployment is very important because it moves technology from demonstration to first of a kind into the marketplace, and it is necessary to have several of those types of projects available so that we can reduce costs and the risks of the technologies in bringing them into the marketplace.

Importantly, in the conference report that the Congress nearly adopted 2 years, the research and development program in H.R. 6, that was embodied in H.R. 6, is the type of research program that we believe is important for you to have in your next bill.

Second, with respect to the demonstration program, also part of the technology development curve, that that actually authorized the $2 billion clean coal power initiative that was first recommended by President Bush, we believe that program also should be embodied in a new bill as well.

With respect, however, to deployment, we have the notion that you have to have a 10-year program with about the same amount of tax incentives available for 10,000 megawatts of power equally divided between gasification and combustion-based systems. We applaud you, Mr. Chairman, for the work you are already doing with respect to advanced coal gasification for industrial and electric applications, and ask that when you consider that you consider combustion as well.

Thank you.

Senator ALEXANDER. Thank you very much.

Mr. Dalton.

STATEMENT OF STUART DALTON, DIRECTOR FOR GENERATION RESEARCH, ELECTRIC POWER RESEARCH INSTITUTE

Mr. DALTON. Thank you, Mr. Chairman.

My name is Stuart Dalton. I am the director for generation research at the Electric Power Research Institute. I would like to make four points today based on our current research.

The first point is that, given the wide variety of coals in the United States, multiple technologies will be needed to use our coal efficiently and to reduce emissions to near zero. The technologies include several types of coal gasification as well as combustion options. Large-scale regional testing of CO_2 storage is needed as well.

The second point: EPRI has started a new collaborative program called Coal Fleet for Tomorrow, with over 40 participants now—better than the last time I was here, so I am glad to report that—representing more than half of all the coal-fired generation in the United States, plus many of the manufacturers, plus a few international participants as well. The key objectives are to reduce costs and accelerate the commercial use of advanced coal technologies.

Electricity from our initial integrated gasification combined cycle plants in the United States will cost more, even without CO_2 capture, we believe 15 to 20 percent more, than conventional coal. That is when those conventional coal include SO_2 and NO_X controls. Additional experience with full-scale IGCC plants will bring the costs down through the learning curve and reduce or eliminate this cost differential.

Fourth point: Incentives will be needed in our opinion to deploy these initial IGCC plants in order to overcome higher capital costs and the technology risks. Initial incentives might provide a different value to different companies, different types of companies. For example, loan guarantees provide significant benefits to independent power producers who have secured power purchase agreements, but little or no benefit to others. A tax credit could provide significant value to companies with tax liability, none to public or cooperative entities. And the new concept of availability insurance may provide carefully targeted value to all company types, but requires more refinement.

We found no single incentive was able to close the gap fully. However, we believe packages could be crafted to do so. We plan to work with DOE to further clarify the cost of the different incentives to the Federal Government as we have been analyzing the cost and impact on the other participants.

We have a draft working paper which is available, and thank you very much for the opportunity.

Senator ALEXANDER. Thank you, Mr. Dalton.

Dr. Der?

Dr. DER. I am here as technical backup.

Mr. BONKOWSKI. There are three of us here from EIA if any technical questions should come up.

Senator ALEXANDER. Okay, all right. So we will go quickly over to Mr. Hadley—or Mr. Rosenberg, excuse me. Sorry, I did not mean to skip you, Mr. Rosenberg.

STATEMENT OF WILLIAM ROSENBERG, SENIOR FELLOW, KENNEDY SCHOOL OF GOVERNMENT, HARVARD UNIVERSITY

Mr. ROSENBERG. Thank you, Senator. Senator Alexander, Senator Bingaman, members of the committee, thank you for the opportunity to be here today. My name is William Rosenberg. I am a senior fellow at Harvard's Kennedy School of Government and appeared before this committee in the natural gas proceeding a few months ago.

The natural gas bills recently introduced by Senators Alexander and Johnson recognize the energy and environmental benefits of widespread gasification of domestic coal and biomass, including lower cost syngas, reductions in natural gas demand and high prices, reduced dependence on imports, less air pollution, and establishing a technology foundation for CO_2 capture and storage.

Over the past 2 years, my colleagues and I at the Kennedy School have developed a loan guarantee program to jump-start construction of a fleet of gasification projects—and this is very important—at the lowest cost to the Federal Government. I would like to focus on that chart over there for a moment. This is a chart that compares, according to our understanding, the budget cost to the Federal Government of different types of IGCC incentives.

In the blue is our estimate of the budget cost of an 80 percent loan guarantee that is scored at 10 percent for this one plant, a $1 billion 600-megawatt plant. The cost would be $80 million to the Federal Government.

Alternatively, a package of grants or investment tax credits of 20 percent would cost the Government $200 million for this plant, and indeed a package of grant or investment tax credits of 50 percent would cost the Government $500 million.

Here is how the loan guarantee, which is so much more cost effective, would work. 80 percent loan guarantees would make capital available to the projects on the most favorable terms—the lowest interest rates and the generally most favorable terms. This committee recognized that in the Alaskan Gas Pipeline bill. The cost of capital as a result would be reduced by 40 percent, which offsets the higher construction costs and makes IGCC competitive.

For electric projects, State public utility commissions would assure the collection of enough revenues to pay the debt service when

it is due, and for industrial projects credit-worthy companies would sign purchase contracts. These two key credit enhancements would minimize the Federal risk, prevent the synfuels type losses, and limit the budget scoring to 10 percent.

The bottom line is when you look at the different incentives direct grants and tax credits, as shown there, are two to six times more expensive than loan guarantees. The loan guarantee program——

Senator ALEXANDER. Mr. Rosenberg, we are well over 2 minutes.

Mr. Rosenberg; I will just finish up.

The program would allow you to live within the budget constraints and still have an aggressive program for developing synthetic gas.

Senator ALEXANDER. How many plants did you recommend?

Mr. ROSENBERG. We believe that $1 billion of authority would produce 20 plants, would support 20 plants, that would generate 500 Bcf of gas, of syngas. $3 billion of authority would generate as much energy as the Alaskan Gas Pipeline.

Senator ALEXANDER. Thank you.

Mr. Hadley.

STATEMENT OF DAVID HADLEY, COMMISSIONER, INDIANA UTILITY REGULATORY COMMISSION, ON BEHALF OF THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

Mr. HADLEY. Thank you. My name is David Hadley from the National Association of Regulatory Utility Commissioners, NARUC, and I am a commissioner at the Indiana regulatory commission. While I had spent over 20 years of my life as a United Mine Worker mining coal, today I work as an economic regulator.

The traditional power plants that come before our commission must add new environmental controls increasingly. One way or another, consumers end up paying that bill. Just several weeks ago, the EPA settled a new source review complaint. To date those settlements have equalled over $4.5 billion for new compliance. No new power, just compliance for environmental requirements.

Business as usual is proposed by some. Build a traditional coal plant, pass some environmental laws, everybody sues everybody else, and finally it comes before us with the cost for a new retrofit and the costs are passed on to consumers once again.

Legislation that has been introduced, Mr. Chairman, by you and others, being discussed here this week and next, are actually hoping to break that cycle. The debate is not if we will burn coal. The question really is how we are going to use that coal most efficiently and environmentally effective. New technology offers hope to lessen U.S. dependence on foreign oil and foreign manufactured natural gas. Today new technology offers us the opportunity to produce domestic manufactured gas from the United States, our Nation's most abundant coal—resource, coal. The technology is IGCC.

The efficiencies alone mean less coal is used per equal Btu, meaning less carbon and less other emissions from such a plant. The same technology even adds greater value to a ton of coal by using it as a byproduct for fertilizer that keeps the industry from

moving offshore, as Wyoming is developing a plant or in Illinois, and a gasifier in Wyoming for ultraclean transportation fuel.

We recommend a portfolio of credit-based mechanisms that should include, target specific risk, be cost competitive, have performance requirements, and used in conjunction with expedited deployment of the initial fleets. We think this is doable now and we thank you for this opportunity for dialog.

Senator ALEXANDER. Thank you very much.

Mr. Lowe.

STATEMENT OF ED LOWE, GENERAL MANAGER OF GASIFICATION, GENERAL ELECTRIC ENERGY

Mr. LOWE. Thank you, Mr. Chairman and members of the committee. I appreciate the opportunity to be here before you. My name is Edward Lowe. I am the general manager of gasification for GE Energy.

The time for rapid and widespread commercialization of IGCC is now. IGCC reduces sulphur dioxide, nitrogen oxides, and particulate matter by approximately 50 percent compared to a state-of-the-art pulverized coal plant. Just as importantly, IGCC is inherently more cost effective at removing mercury and carbon dioxide.

Initially these plants will be more expensive, as other speakers have stated. To lower costs, GE will provide a standard IGCC plant that is projected to rapidly achieve cost parity with pulverized coal plants. Many power generators operate in a deregulated environment where new generation is competitively bid. This process penalizes higher cost advanced technologies that might have longer term efficiency and environmental cost advantages. Even regulated power generators may find it difficult to select advanced technologies that come with a significant cost premium.

Federal help is needed to address the higher initial costs of advanced technologies. Investment tax credits, production tax credits, and grants for early technology adopters are all potential mechanisms. Also, first of a kind engineering programs can drive down the initial premiums required to utilize all ranks of coal.

To sum up, IGCC is a commercially available technology that allows us to use our most abundant domestic fossil fuel, coal, with environmentally superior emissions. IGCC can surpass existing environmental regulations and offers a cost effective solution for potential constraints on mercury and carbon emissions. However, Federal incentives are required to accelerate the deployment of IGCC.

Thank you.

Senator ALEXANDER. Thank you, Mr. Lowe.

Let me thank each of you for being succinct, a good example for Senators.

Senator Thomas and Senator Salazar have joined us. We have to leave by about 4 o'clock to vote and there will be a series of four votes at that time. So Senator Bingaman and I dispensed with basically our initial comments. I would like to ask the other Senators if it would be all right with you if—I am going to suggest that we—I am going to ask one question, ask you to make a very brief comment if you have something to say, maybe 30 seconds, and then

you can expand on that. We and the staff will expand on that. Then I will go to Senator Bingaman.

Then when we get to 20 'til, I will invite the second panel to come up and we will have a chance to receive their testimony before we vote. Does that sound all right?

Senator BINGAMAN. Yes.

Senator ALEXANDER. You have talked about multiple technologies and you have talked about a low-cost way to provide financing for multiple technologies. What about, do you have any suggestions for how we could introduce certainty into your business plans? Because sometimes I get a sense that certainty would be better than a subsidy.

Are there some things we can do legislatively that permit these new technologies to succeed, that would be just—that would be worth just as much to you as dollars?

Mr. Rosenberg.

Mr. ROSENBERG. Senator, I think if you have a target, an authorization for a certain number of projects, and with loan guarantees you assure the availability of 80 percent of the capital for those projects, so you establish a certainty for a company that then could come forward, make an initial proposal to the Department of Energy, and be selected, where construction would begin say 2 or 3 years from that time.

Knowing that the capital would be there at the most favorable rates is probably the most significant thing that could be done in addition to making sure that the State public utility commission in the relevant area is joining with that.

Senator ALEXANDER. Anyone else?

Senator Bingaman? Oh, Mr. Dalton.

Mr. DALTON. Just a brief comment. Certainty in regulatory requirements, such as emissions control requirements, what goal will need to be met, since some of the technologies have environmentally superior performance, if there is some certainty to that. Now, I recognize that that is a different question than just the energy bill. It also implies other regulatory requirements. But that is one example of requirements that help make the choice to put additional money on the table to be able to meet the new energy requirements.

Senator ALEXANDER. That might be a question that could be addressed by the energy bill. Do not know.

Mr. Palmer.

Mr. PALMER. Senator, with respect to the question of certainty on emissions standards, there are maybe 90 new coal plants that are being pursued and planned in the United States today in the face of great uncertainty. So I do not think the emissions uncertainty as such holds back development in coal-based generation.

I do think by involving the Federal Government in a major way as partners in integrated gasification combined cycle, in advanced pulverized, PC, technology, Future Gen, I think, would send a very reassuring signal to the energy community that the United States likes carbon-based fuels.

Senator ALEXANDER. Thank you.

Let me go to Senator Bingaman now, just so everyone can have a chance to comment.

Senator THOMAS.Let me just—did you say 90 plants are being planned?

Mr. PALMER. Close to 90 generation plants around the country are being planned right now and several are actually under construction.

Senator THOMAS. Coal plants?

Mr. PALMER. Coal plants.

Senator THOMAS. They must be quite a ways from being under construction, though.

Mr. PALMER. Correct, Senator, and not all 90 will get built.

Senator THOMAS. We have not had 90 in how many years.

Mr. PALMER. Since Project Energy Independence.

Senator ALEXANDER. Senator Bingaman.

Senator BINGAMAN. Yes. As I understood Mr. Dalton's statement, there are several very promising technologies that are of a coal gasification nature.

Mr. DALTON. Yes, sir.

Senator BINGAMAN. I guess I am just trying to get this clear in my mind. Mr. Rosenberg, maybe you could tell me, what would be the right way? Would we set performance parameters and say that the Government would make these loan guarantees available to companies that, or to projects that, meet certain performance criteria as far as the reduction in emissions, as far as the increased efficiency?

What are we measuring here? Also, if you could just explain. I know we had in our earlier forum discussion about the fact that this does not include the cost of capturing the carbon, sequestering the carbon. That is an add-on. And the technology is not there yet to know how to do all of that, as I understand it.

How does that all relate to what we are talking about here?

Mr. ROSENBERG. Senator Bingaman, indeed there should be performance standards, and I believe Senator Alexander's bill has performance standards and even has a provision in it that the technology should be carbon capture-ready, which needs to be defined. It does not mean you make the investments, but it means that when the time comes to make those investments there is not a penalty paid to take things out and put new things in.

I believe that should be part of the competition for the funds. It not only should be how much does it cost the Government if somebody comes forward with a program that would cost less that would be preferential, but how should the environment be treated, what would be the impact on ratepayers. I think there would be a whole list of performance standards that could be objectively developed and applied on these applications.

Senator BINGAMAN. Thank you, Mr. Chairman.

Mr. YAMAGATA. Mr. Chairman, if I may, in response to Senator Bingaman for a moment, please. That is with respect to certainty, but also with respect to performance standards. The type of program that we are proposing in fact includes emissions performance standards as well as in the case of advanced combustion systems an efficiency performance standard.

I would like to make a comment about certainty and that is to turn it around and say the Federal taxpayer needs certainty as well. In the context of projects and projects that are chosen, it

seems to us that we should not leave these projects dangling if they are never going to happen. We have all had experience in that regard with respect to Federal programs trying to help here. But there ought to be some method of certainty for ensuring that these projects really do take place, and if after a period of time it does not happen then any commitment from the Federal Government ought to be vitiated.

Senator ALEXANDER. Let me go to Senator Thomas, and if anyone had additional comments on that you could submit them.

Senator THOMAS. Well, I am pleased that you are here talking about coal, of course, because I think it is our—but I am a little confused. Are there any projects that are now producing product?

Mr. PALMER. Brand new plants?

Senator THOMAS. Yes.

Mr. PALMER. Yes, there are several plants that are under construction.

Senator THOMAS. But none are producing?

Mr. PALMER. I think, Senator, actually one unit did come on line last year, the Springerville plant in northern Arizona.

Are you talking about gasification plants?

Senator THOMAS. Yes.

Mr. PALMER. Gasification plants.

Senator THOMAS. And what are they producing?

Mr. LOWE. There were two plants that were constructed in about 1995 of approximately 250 megawatts, to demonstrate the capability of integrating gasification-combined cycle. So the technology has been proven. Right now there are two plants operating in my State. The challenge is getting it to a large enough scale and deploying it in order to drive down the cost so there is not significant cost penalty.

Senator THOMAS. I see. But they are producing?

Mr. LOWE. Tampa Electric for the Folk Station in Florida is a reference of one plant that is operating quite well.

Senator THOMAS. But what are they producing?

Mr. LOWE. They are producing electricity, using coal to produce a synthetic gas that then is combusted and used to produce electricity.

There is also, in the area of gasification, Eastman Chemical ends up producing a syngas that then they use in chemical processes for the production of methanol in our State.

Senator THOMAS. What size of plant? What size do they have to have to be economical?

Mr. LOWE. We believe it needs to be approximately 600 megawatts, which is about double the scale of the gasification combined cycle plants that are currently operating.

Senator THOMAS. Then of course, we do this, particularly if it is mine-mouth, then we have to have the transmission system to get it to the market.

Mr. LOWE. That is correct, Senator.

Senator THOMAS. How large do you think they can be finally? 2,000, 3,000 megawatts?

Mr. LOWE. I think what you would probably do is be in the range of traditional coal plants, or in the range of 600 to 900 megawatts,

and then you put multiple plants on a site. Certainly a site producing 2 to 3,000 megawatts is technically feasible.

Senator THOMAS. Thank you.

Senator ALEXANDER. Thank you.

We have 3 minutes left for this panel and two Senators. Senator Salazar.

STATEMENT OF HON. KEN SALAZAR, U.S. SENATOR FROM COLORADO

Senator SALAZAR. I have three questions and you do not have to answer them for me right now, but I would appreciate answers in writing if you can. One is the impact that IGCC would have on the ratepayers and specifically the differences between the loan guarantee program and other Federal approaches that might be taken, what ultimately is the impact for the ratepayer.

Question No. 2: What is the difference in technology to be used with respect to eastern coal versus western coal? We have very clean coal in my State. Are there technological differences with respect to coal gasification of those types of coal?

Three: Why is there reluctance among some of the electrical generating companies to embrace this technology? I know of two instances in my State where we are building coal plants on pulverized coal as opposed to pursuing this technology, and the sense is that we are not ready for embracing this technology at this point in time.

You do not have to answer my questions, but I really would appreciate—I would appreciate a written response to my questions.

Senator ALEXANDER. Thank you.

We will go to Senator Bunning and let him say whatever he would like, ask questions, and if you could respond to those in writing. Then we will invite the next panel up so we can get their testimony.

STATEMENT OF HON. JIM BUNNING, U.S. SENATOR FROM KENTUCKY

Senator BUNNING. Well, my major concern obviously is the use of coal in all capacities, to be able to burn it, to clean it up, and use all types of coal for electric generation. The technology some argue is not there. Some argue that we do have the technology. We have got some programs that we actually put in the FISC ETI bill, but there are not enough money in those programs to really have all generators use some type of new clean coal technology to meet the Clean Air II and beyond.

So with the new bill that we are proposing or we hope we are going to propose, there will be about $2 billion in it either through DOE and-or direct subsidies to coal companies and to generators, to come up with the technologies that we need so that you can burn my West Kentucky coal and my East Kentucky coal, and even Wyoming coal and Tennessee coal and anybody else that has a lot.

But we also need to realize that we have to be able to extract from coal other synthetics, carbon—not the carbon, but extract the carbon and use the gasification and-or the fuels that we can get from coal, hydrogen. I think eventually hydrogen is going to be a big, big player.

Now, there are a lot of people with technologies. So if you have any ideas that will advance those, please get them to us as quickly as possible.

Thank you.

Senator ALEXANDER. Thank you, Senator Bunning.

Let me thank each of you for being here, for your succinctness. I am quite serious. You are right on point. We do not have a consensus of results yet, but we have a consensus of interest and a very strong one in what you are telling us.

We thank you for coming, and I would now like to invite the second panel to come forward.

Senator ALEXANDER. All right, if we can get the name tags up we will start. Why do we not start with Mr. Hamberger, and we will ask each—we will follow the same rules we did before. Each of you, we will thank you for your written statements and if each of you would highlight your statements in 2 minutes that will leave us a little time for questions, and then we will be able to vote.

Mr. Hamberger.

STATEMENT OF EDWARD R. HAMBERGER, PRESIDENT AND CEO, ASSOCIATION OF AMERICAN RAILROADS

Mr. HAMBERGER. Thank you, Mr. Chairman.

U.S. freight railroads account for roughly two-thirds of U.S. coal movements and last year had a record year. 2005 is starting out to exceed even the 2004 year. Not only do we move a lot of coal, including 400 million tons from Wyoming and a lot of coal from Kentucky bound for export, but we move that coal at reasonable rates.

The two charts behind me illustrate that from 1981 to 2003 rail coal rates, the blue line, reduced by 63 percent in inflation-adjusted terms. The chart also reveals that rail coal rate declines have substantially outpaced the 25 percent decline in average electricity prices, which is the red line, over the same period.

The second chart shows that the delivered price of coal to electric power plants, the blue bars, has trended downward over the past 15 years, in stark contrast to the delivered prices of petroleum, in yellow, and natural gas, in red, on a per-Btu basis.

Together these graphs illustrate that railroads have played a key role in helping hold down the cost of producing electricity. We do that at a cost of billions of dollars each year, in fact 17 percent of the total revenues, reinvested back into the infrastructure and equipment. These investments have permitted railroads to sharply increase their coal-carrying capability as coal demand has climbed. Ton-miles are up 161 percent since 1981.

The Department of Energy estimates that total U.S. coal consumption will increase even more rapidly in the coming 20 years. Railroads hope to be able to handle the increased demand for coal transportation and we think we will be able to do so as long as the ability to make the necessary investments in the network is not constrained.

Recent dramatic increases in freight volumes across the board have led to some service erosion affecting rail customers and these have highlighted the importance of continued strong rail invest-

ment in capacity. To meet future expected demand, railroads must be allowed to earn enough to fund their investment needs.

Policymakers can do two things: One, do no harm. Reregulation of the industry would make it impossible for railroads to earn enough to reinvest. Second, pass the President's clean air bill and the comprehensive energy legislation needed for clean coal technology and certainty for our friends in the utility industry.

Thank you.

Senator ALEXANDER. Thank you, Mr. Hamberger.

I did not even take the time to introduce the subject, which is what improvements in existing transportation or transmission structure are needed to improve the use of coal for power generation.

STATEMENT OF ROBERT SZABO, EXECUTIVE DIRECTOR AND COUNSEL, CONSUMERS UNITED FOR RAIL EQUITY

Mr. SZABO. Senator Alexander, I am Bob Szabo. I am the executive director and counsel to Consumers United for Rail Equity. We have a different story than Mr. Hamberger. Our clients are subject to railroad monopoly power. 25 years after railroad deregulation, there is a significant amount of railroad monopoly power. It often attaches to people that move railroad to power plants. The people that move the coal to power plants are the utilities. They buy the coal at the mine mouth and they pay for the unit trains, they often pay for the cars, and they move the coal.

We think that probably two-thirds of the coal that moves is captive to a single railroad. The problem with that is that the railroads are not subject to the antitrust laws of the Nation. So when you are subject to the monopoly power of a railroad your remedies are at the Surface Transportation Board. We believe those remedies do not work at all. Shippers do not win at the Surface Transportation Board.

So what is the result of that? The result of that is that, first of all, electric utility—electric ratepayers are paying unduly high rates inflated by monopolistic railroad rates. We think that where monopolies are involved they do not always get the same price signals that they should, so we are not getting improvements in transportation. Some day, we think, because, dare I say, some day more capital is going to be needed to be applied to the use of coal, coal may not be able to carry the rail industry and new capital to burn coal cleanly.

I gave you some schematics of some of the artifices that are used to make people captive that are not captive and get monopoly rates, and obviously we are petitioning Congress to try to address these problems.

Thank you very much.

Senator ALEXANDER. Thank you very much.

Mr. Owens.

STATEMENT OF DAVID OWENS, EXECUTIVE VICE PRESIDENT, EDISON ELECTRIC INSTITUTE

Mr. OWENS. Thank you, Senator. I am David Owens, executive vice president of the Edison Electric Institute.

In view of time, I am going to really concentrate my statement on the issue of the transmission infrastructure. As you know, reliable electric service and regional electricity markets depend on a strong transmission system to move power instantaneously to where it is needed, particularly from baseload coal-fired generating stations, which in many instances are very distant from the population.

Now, in my view many of the measures needed to restore our transmission infrastructure are really contained in H.R. 6. I just would like to take a minute and just kind of elaborate on a couple of those provisions. H.R. 6, for example, provides for a mandatory reliability system with enforcement mechanisms, which is in contrast to our current voluntary system.

H.R. 6 would provide in the instance where States would not agree on the need for transmission, it would seek to give FERC, Federal Energy Regulatory Commission, backstop signing authority. I think this is particularly important for coal to ensure that electricity produced at mine mouth plants can be delivered to distant load centers.

H.R. 6 would also improve coordination of Federal permitting process for transmission facilities. As you know, there is a very complicated process for getting access across Federal lands to site transmission. H.R. 6 would seek to facilitate that process.

H.R. 6 would also provide some very important transmission pricing reforms for the Federal Energy Regulatory Commission that would provide what we consider to be important signals to encourage investment in transmission.

H.R. 6 would repeal the Public Utility Holding Company Act, which is a barrier to new transmission investment.

We also support very strongly important tax code changes which would provide accelerated depreciation for transmission, moving from a 20-year period to a 15-year period. As other participants in this conference who have appeared before you, we certainly also do support investment for new clean coal technologies.

I would echo some of the things that Mr. Szabo said about rail transportation. We are members of CURE and we strongly support many of their views. I also need to stress that coal is also moved on waterways and we are strong supporters of enhancing our overall waterway infrastructure.

Thank you for this opportunity.

Senator ALEXANDER. Thank you, Mr. Owens.

Mr. Heller.

STATEMENT OF THOMAS J. HELLER, CEO, MISSOURI RIVER ENERGY SERVICES

Mr. HELLER. Senator Alexander, Senator Bingaman, and members of the committee, my name is Tom Heller. I am with Missouri River Energy Services. Missouri River Energy Services is a wholesale power supplier to 58 municipal utilities located in South Dakota, North Dakota, Iowa, and Minnesota. We own a 17% interest in the 1,650-megawatt coal-fired Laramie River Station located in Wheatland, Wyoming, and we are participating in two efforts to build new coal generation in North or South Dakota.

Coal is an abundant domestic resource of critical value in meeting our energy needs of the future. Furthermore, there is a growing need for baseload plants and coal-fired generation must be part of our Nation's future energy portfolio.

However, the ability to add new baseload generation is dependent upon two things: No. 1, adequate transmission and supporting policies to assure delivery of the power from remote generation sites to load centers; and No. 2, relief for captive shippers from transportation costs that have become very, very high. Unless we break—unless these issues are successfully resolved, the future of coal is, however, I think regrettably bleak.

Missouri River urges congressional action to: No. 1, direct FERC to issue rules that enable electric utilities to secure firm transmission rights or equivalent tradable or financial rights for the long-term delivery with reasonable price certainty; No. 2, facilitate the planning and expansion of transmission facilities to support such rights; No. 3, facilitate transmission siting from a Federal level; No. 4, promote the regionalization of costs of high-voltage transmission facilities.

I would also like to associate myself with the comments of CURE. The need for legislation to provide relief to captive shippers is real and immediate. BNSF currently transports some 8.3 million tons of coal approximately 175 miles from coal mines in Wyoming's Powder River Basin to Laramie River Station. A longstanding contract for this service recently expired and the new common carrier rates are now in service, and they have doubled our cost of coal transportation. It is projected that the cost to the owners of LRS will be a billion dollars over the next 20 years. To us, this translates into $70 per retail customer per year for the next 20 years.

It is our hope that Congress will provide some legislative relief to these captive shippers.

Thank you.

Senator ALEXANDER. Thank you, Mr. Heller.

Mr. Mohre.

STATEMENT OF DAVID MOHRE, EXECUTIVE DIRECTOR, ENERGY AND POWER DIVISION, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. MOHRE. Senator, thank you. My name is David Mohre. I am Executive Director of the Energy and Power Division for National Rural Electric Cooperative Association. You are probably aware cooperatives supply about 40 million Americans electric power in all or parts of 83 percent of the counties in the United States.

I believe we all agree, from what I have heard, that the use of coal is critical not only to keeping U.S. electricity rates competitive and reliable and secure from foreign influence, but also to moderating the rapid increase we have seen in natural gas prices over the past several years. I would like to suggest that one of the most critical issues involved here is one we do not talk about much, and that is making sure the transmission grid is capable of carrying out that function.

This is both through timely enhancement of the existing grid and in the longer run regionally planning for the bigger picture, if you will. You have probably seen studies, as I have, showing that if we

could enhance the transmission grid a little bit, the existing grid, we can probably save about a Tcf of natural gas used through enhanced coal use in existing plants.

If we take a look at doing that, okay, you are talking about perhaps a 50 cent or a dollar reduction in the price of natural gas, and that equates to about a 10 to $20 billion reduction in the cost to consumers of natural gas and a concomitant reduction in the cost of electricity.

Now, why is that important today? Well, I think it is particularly important today because we have this little 2 to 3 Tcf overhang of new natural gas-fired generation that is on the ground and waiting to go. People do not realize we use about the same amount of gas today as we used 30 years ago. But if these gas units are turned on there is going to be a tremendous run-up in prices, and that is before we take into consideration the fact that the EIA recently increased the cost projection for this year to $6.95.

In the future, let me just say one thing. One of the critical elements is are we going to be able to site and invest in these $1 to $2 billion coal plants? Well, it is going to be very difficult if you cannot get there from here. Part of the problem is under the new regional transmission organizations you cannot get, as Mr. Heller said, long-term transmission at reasonable prices. We have to fix that problem.

Senator ALEXANDER. Thank you.

Glenn McCullough, welcome.

STATEMENT OF GLENN McCULLOUGH, JR., CHAIRMAN, TENNESSEE VALLEY AUTHORITY

Mr. MCCULLOUGH. Thank you, Chairman Alexander, Ranking Member Bingaman, members of the committee. On behalf of the TVA board of directors and our employees, thank you for the opportunity to appear here today. I am Glenn McCullough, Jr. I have served as TVA's chairman since July 2001.

Coal is America's most abundant domestic source of energy. What oil is to Saudi Arabia coal is to the United States. TVA relies on coal for a significant portion of our generation, just over 60 percent in 2004. Continued use of coal is an important part of TVA's strategy to provide affordable, reliable electric power to 8.5 million people in our service territory. Keeping coal as an integral part of TVA and the Nation's energy mix is essential to the economic wellbeing of both the Tennessee Valley and our Nation.

I am going to briefly summarize our response to question number 4 regarding the improvement, improving coal for power generation, by saying that it may be cheaper to invest in coal transportation rather than extra high-voltage transmission lines, but what is sometimes overlooked in the coal-by-wire discussion is that redundant paths are needed for transmission lines to move major blocks of power from coal-rich areas to population centers.

However, there are some problems in the coal transportation area also. The major railroads and barge companies are beyond their ability to provide timely and cost-effective delivery of coal to utilities. For coal-fired power generation to increase in future years, railroads and barge companies must have the capacity in place to meet increased customer demand.

It would seem to us that a balanced approach of improving both the coal transportation and the power transmission systems would make the most sense. Investment in technology and capacity improvements in power transmission, rail lines, and barge lock systems will all be required for a comprehensive approach to maintain and to encourage greater use of coal for power generation in the future.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Mr. McCullough.

Thanks to each of you.

The vote has started, but I think we have time for each of us to ask a question or make a comment, and then we would ask you just to respond to it in writing if you would not mind. I think all of you know how to get in touch with the professional staff or with us if you need to.

My question would be simply, it would help me if you could provide me with one or two examples of siting difficulties for transmission capacity so I could—you probably have several to choose from, but a few examples of that would be a help, and how the energy bill that we are working on might help prevent those kinds of problems in the future. That would be my question.

Senator Bingaman.

Senator BINGAMAN. Mr. Chairman, in light of the time constraints we have, let me just thank all the witnesses. I think it has been useful. I wish we had more time to delve into some of these issues. But I am sure we will try to read through all the detailed statements that have been given to us and digest what is in there. Hopefully, you will see some of that reflected in the legislation that we proceed with.

Thank you very much.

Senator ALEXANDER. Senator Bunning.

Senator BUNNING. I am very interested in transmission and certain areas of our State are having difficulty getting transmission from one place to another. Certain transmission lines are owned by one utility over another. We have to get some type of cooperative effort so that we can keep rates low and get transmission to all areas, both rural and urban, in all parts of this country, and we have to do it as quickly and without new regulations.

I would like to see them voluntary. A lot of people want a mandatory regulatory scheme that I am not for.

So if you could make suggestions on transmission and how to get it from one area of the State and/or one area of the country, because that is a major, major problem right now, the double use or the use of other people's transmission lines without a huge service charge for using them, a reasonable rate that would not blow the electricity out of the water that goes through those transmission lines.

Thank you.

Senator ALEXANDER. Thank you, Senator Bunning.

Thanks again to each member of the panel and to the first panel for your thought and for the extra effort you have made and for adjusting yourselves, as we have to, to the schedule of the U.S. Senate. We look forward to your written answers and to any further comments.

The hearing is adjourned.
[Whereupon, at 4:01 p.m., the symposium was adjourned.]

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