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HEARING TO REVIEW ELECTRICITY RELIABILITY IN RURAL AMERICA

HEARING

BEFORE THE

SUBCOMMITTEE ON CONSERVATION, CREDIT, ENERGY, AND RESEARCH

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

WEDNESDAY, JULY 30, 2008

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HEARING TO REVIEW ELECTRICITY RELIABILITY IN RURAL AMERICA

WEDNESDAY, JULY 30, 2008

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON CONSERVATION, CREDIT, ENERGY, AND RESEARCH,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:35 a.m., in Room 1300 of the Longworth House Office Building, Hon. Tim Holden [Chairman of the Subcommittee] presiding.

Members present: Representatives Holden, Herseth Sandlin, Cuellar, Costa, Space, Scott, Salazar, Boyda, Gillibrand, Donnelly, Lucas, Schmidt, and Moran.

Staff present: Claiborn Crain, Nona Darrell, Adam Durand, Alejandra Gonzalez-Arias, Scott Kuschmider, Patricia Barr, Josh Maxwell, and Jamie Weyer.

OPENING STATEMENT OF HON. TIM HOLDEN, A REPRESENTATIVE IN CONGRESS FROM PENNSYLVANIA

The CHAIRMAN. The Conservation, Credit, Energy, and Research Subcommittee hearing to review electricity reliability in rural America will come to order. I would like to thank the witnesses for being here, and I look forward to their testimony. Today we are going to look at issues surrounding electricity in rural America.

In the 1930s, 90 percent of Americans living in urban areas had electricity, while only 10 percent of rural citizens had the same. The Rural Electrification Act of 1936 changed this by allowing the Federal Government to make low-cost loans in order to bring electricity to rural America for the first time.

Luckily, we are no longer in the 1930s, but our nation's energy demands are at a critical point, and we must explore every opportunity to invest in rural communities and meet our growing power needs.

During the consideration of the farm bill, several questions arose regarding the future of electric power in rural America. The ability of rural areas to develop economically depends on a strong, reliable infrastructure including electric power generation, transmission, and distribution. With the growing demand for power, it is time to find the solutions that will best serve our national needs and make economic sense.

Now is not the time to pick a generation feedstock over another while some technologies, such as carbon capture and sequestration, are still being developed. We all know finding a way to limit emis-

sions is the key to any new generation project, but we must also address the issue of financing generation and transmission needs before we automatically exclude low-cost options.

Renewable production can play a role in our energy future, but it will take a balance of all resources to meet our electricity demands. We must design policies that work together and modernize systems to reach our goals. Agriculture and energy are logical partners, and much of all renewable energy generation can and should occur in rural America.

A major barrier to making the best use of renewable energy is transmission capacity to get that energy to the markets where there is the most demand. The development of wind and solar generation farms opens the opportunity of power farming as a part of our rural solution to economic prosperity. To be part of the opportunities and growth that will occur in the 21st Century, rural America must have access to the technological and information developments that are coming each year.

Electric reliability at an affordable cost is a major aspect of these new opportunities. Today's hearing will hopefully teach us about our power generation needs, production technology development, infrastructure, and associated costs. And I look forward to hearing from our panel in testimony today.

[The prepared statement of Mr. Holden follows:]

PREPARED STATEMENT OF HON. TIM HOLDEN, A REPRESENTATIVE IN CONGRESS FROM PENNSYLVANIA

I would like to thank the witnesses for being here and I look forward to their testimony. Today we are going to look at issues surrounding electricity in rural areas.

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During consideration of the farm bill, several questions arose regarding the future of electric power in rural America. The ability of rural areas to develop economically depends on a strong, reliable infrastructure, including electric power generation, transmission and distribution. With the growing demand for power, it is time to find the solutions that will best serve our national needs and make economic sense. Now is not the time to pick a generation feedstock over another while some technologies, such as carbon capture and sequestration, are still being developed. We all know finding a way to limit emissions and providing for a capture and trade process is the key to any new generation project, but we must also address the issue of financing generation and transmission needs before we automatically exclude low cost options such as coal.

Renewable production can play a role in our energy future, but it will take a balance of all resources to meet our electricity demands. We must design policies that work together and modernize systems to reach our goals. Agriculture and energy are logical partners, and much of our renewable energy generation can and should occur in rural America. A major barrier to making the best use of renewable energy is the transmission capacity to get that energy to the markets where there is the most demand. The development of wind and solar generation farms opens the opportunity of "power farming" as a part of our rural solution to economic prosperity.

To be a part of the opportunities and growth that will occur in the 21st Century, rural America must have access to the technological and information developments that are coming each year. Electric reliability at an affordable cost is a major aspect of these new opportunities.

Today's hearing will hopefully teach us about our power generation needs, production technology development, infrastructure, and associated costs. I look forward to hearing from our panelists.

The CHAIRMAN. And I recognize my friend, the Ranking Member from Oklahoma, Mr. Lucas.

OPENING STATEMENT OF HON. FRANK D. LUCAS, A REPRESENTATIVE IN CONGRESS FROM OKLAHOMA

Mr. LUCAS. Mr. Chairman, thank you for calling today's hearing so we can discuss the reliability of electricity in rural America. I look forward to hearing from witnesses about the challenges we face in keeping up with electricity demand.

The source of our energy troubles comes down to basic supply and demand. Demand for electricity usage is at record levels, pushing our nation's current energy providers to their limits. Addressing this energy crisis is a top priority of mine, and I believe should be a priority of this Congress.

I have constantly supported expansions to our nation's energy supplies in clean, efficient ways. We not only need to help expand and enhance the existing methods of electricity production, such as expanding clean coal harvesting, but we also need to develop new and alternative energy sources such as wind power and nuclear power.

I am a proponent of wind power and have supported the wind power industry in establishing wind farms in Oklahoma. Wind power is one of the most efficient forms of energy, and Oklahoma's wind industry is currently the ninth producer in the nation.

American's wind production potential is far from fulfilled in many states but unfortunately been opposed by some who oppose those wind turbines being built within their borders. In addition to supporting wind industry in becoming established, more research and development is needed on how to transport the energy produced from wind turbines. If we are going to utilize renewable energy, then we must have a way in which to get it to the most populated areas of this country.

I am interested in learning more today about what our greatest challenges are in ensuring that we continue to have reliable, affordable electricity in this country and in rural America.

In the 1930s, Congress addressed the needs of rural America by providing Federal assistance for electric generation. When this program began, only 10 percent of rural residents had electricity. By 1950s, nearly 90 percent of U.S. farms had electricity. The Rural Electrification Act is a shining example of how a government program can truly make a difference.

Now we must focus on how to maintain the reliable and affordable electricity that we have all come to know. We can do this by exploring and developing all of our renewable resources, expanding our transmission capacity, becoming more energy efficient, and committing more funding to research and development of new technologies.

Again, Mr. Chairman, it is always a pleasure to serve with you on a hearing, and I look forward to the important information that we will glean today. Thank you.

The CHAIRMAN. The chair thanks the Ranking Member and would ask all other Members of the Subcommittee to submit their opening statements for the record.

[The prepared statements of Messers. Peterson, Goodlatte, and Salazar follow:]

PREPARED STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Thank you, Chairman Holden, for calling this hearing and for the work you and Ranking Member Lucas are doing to ensure proper oversight of the issues vital to farm country and rural America.

Today's hearing is a great opportunity for Members of this Committee to get up to speed on the major issues surrounding electricity generation and delivery in rural areas.

All of us on this Committee spend a lot of time working to improve the economic conditions of rural America. And the health of rural America is only as good as the infrastructure that supports it. Reliable electricity was at one time unheard of in rural America. It's hard to imagine that kind of situation existing today, but this Committee should be no less interested in this issue, because although times have changed, many rural electricity systems are in need of constant upgrading, extending, and replacing.

Many concerns about the reliability of rural electrification were raised as this Committee worked on the farm bill. While some of those were addressed in the legislation, there are a lot of unresolved issues that will have to be dealt with over the long term.

The consensus coming out of the farm bill was that we really need to get Members educated on all aspects of rural electrification and the power market, and that's what today's hearing is all about. We will examine baseload generation, capacity, transmission, distribution, and the regulatory structure that oversees it all.

One area of great interest to this Committee is the capability of renewable energy producers to access the grid. Rural areas are a great source of clean, renewable energy technologies, like wind, hydropower and solar, that can contribute to our nation's energy security for future generations. The ability of rural producers to access capital and navigate the patchwork of Federal, state, and local oversight can allow farmers and ranchers to power themselves and their neighbors.

This has great economic development potential for rural communities in the long run.

I know with the leadership of Chairman Holden and Ranking Member Lucas, this Subcommittee will be doing a lot more oversight on reliable electricity and other infrastructure issues that are vital to rural America, because they are simply too important to ignore until after the fact.

I welcome today's witnesses and I look forward to their testimony. I yield back my time.

PREPARED STATEMENT OF HON. BOB GOODLATTE, A REPRESENTATIVE IN CONGRESS FROM VIRGINIA

Mr. Chairman, thank you for holding today's hearing to review electricity reliability in rural America.

The United States is facing an energy supply crisis. Reliable and affordable electricity is expected in every home in the United States. However, the policies of Congress over the past 30 years have compromised the future availability of powering our homes and workplaces.

I was very disappointed that a provision in the Senate-passed farm bill that would once again allow Rural Electric Co-ops to access RUS financing for any type of baseload electric generation did not make it into the conference report. Unfortunately, as a result, baseload generation from Nuclear, Gas, Coal with Carbon Capture sources will continue to be difficult, if not impossible to finance.

This lack of financing for baseload generation forces Co-ops to buy electric power on the open market. Since the cheapest power on the market is generated from coal, Co-ops would be buying coal generated electricity from other sources; this will not lead to reduced CO_2 emissions.

The rest of the world is far outpacing the U.S. in its commitment to clean nuclear energy. We have not built any new nuclear facilities in over 25 years and generate only 20 percent of our electricity from this clean energy, when other countries can generate about 80 percent of their electricity needs through nuclear power. Nuclear energy is the most reliable and advanced of any renewable energy technology, and if we are serious about encouraging CO_2-free energy use, we must support nuclear energy.

Abundant and affordable energy and energy conservation are the keys to a strong economy. Until alternative fuel technology becomes more affordable and convenient, our cars, our jobs, and our economic growth will run on traditional energy sources. Coal is one of our nation's most abundant resources. We should do more to encourage clean coal technology such as Coal-to-Liquid and Carbon Capture and Sequestration.

We must continue to encourage the development of renewable energy, such as wind, biomass, and hydropower. But relying heavily on these technologies is not the answer. By shifting to renewable energy sources that are not as available or as cost effective as traditional sources, we will see a rise in energy prices across the board. We must diversify our energy supply with new and traditional, environmentally friendly energy resources.

I look forward to hearing today's testimony.

PREPARED STATEMENT OF HON. JOHN T. SALAZAR, A REPRESENTATIVE IN CONGRESS FROM COLORADO

Good morning, I would like to thank Chairman Holden and Ranking Member Lucas for holding this important hearing.

I also want to thank the witnesses of the two panels for coming to testify and provide background information on electricity in rural America.

As you know, the 3rd District of Colorado is largely rural. While this quality helps preserve our land and maintain its beauty, it hinders our ability to take advantage of some technology and energy supplies.

All communities deserve access to broadband and affordable electricity.

We need to encourage companies to send broadband to our rural communities. We also need to incentivize groups to carry renewable energy from districts similar to my own to more urban areas.

My district is among those with the greatest potential to produce renewable energy, such as wind, solar, and clean coal.

We need to find a way to produce these renewables and then transmit this energy nationwide.

Over the next 20 years, the U.S. will need to create four times the amount of power currently produced in California.

We can only do this by being smart about energy legislation today.

We need to maintain T. Boone Pickens' mantra that we cannot simply drill our way out.

We need a comprehensive solution that includes fossil fuels and renewable energy if we ever want to reach energy independence.

Our districts can be the heart of the growth of renewable energy, but we need to allocate funds and review the REA to see how we can best help this surge.

With that said, I am anxious to hear the thoughts of our panelists as they discuss rural electricity.

Again, thank you Chairman and Ranking Member.

The CHAIRMAN. And I would like to welcome our first panel. Administrator Jim Andrew, Rural Development Utilities Programs for the United States Department of Agriculture. Ms. Cynthia Marlette, General Counsel, Federal Energy Regulatory Commission. Administrator Andrew, you may begin when you are ready.

STATEMENT OF HON. JAMES M. "JIM" ANDREW, ADMINISTRATOR, RURAL DEVELOPMENT UTILITIES PROGRAMS, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Mr. ANDREW. Mr. Chairman, Members of the Subcommittee, thank you for the invitation to share our views on the reliability of the nation's electric system. My written statement reflects our comments on capacity and the need for additional capacity with some extensive documentation.

Because I believe other panelists will go further into capacity for reliability, I want to address another facet of reliability: the physical condition of the system as we know it. Mr. Chairman, as noted,

we are U.S. Rural Development Utilities Program. We are the REA, blending with the other rural agencies to make up USDA Rural Development.

Our constituencies are the rural electric, rural water and waste, rural telephone, and broadband systems of America. But for purposes of this hearing, my statement will deal with rural electric systems.

I am sure you know that this program is generally considered a bank, and we do make loans. Today we have just over $35 billion in outstanding loans on the books. Before a loan is approved and the money is obligated, there are many things that are considered by the professionals in the agency. We feel the government has no money. The funds we commit are taxpayers' money. It is our responsibility to invest them for the good of the borrowers who are member/owners of the electric cooperative.

It is also our responsibility to see to it that the money is paid back. On that point, the program has less than 0.02 percent past due 30 days and practically nothing past 60 days. In addition to financial concerns, the system must stand up to the rigors of weather and time placed on it so those taxpayers get their money's worth.

From the beginning, the Rural Electrification Administration, the REA, has been innovative. The completely new distribution systems designed by the engineers back then still stand as a model. Furthermore, those systems still stand. It was just after the Depression; money was very tight, and the system needed to be built as inexpensively as possible and still have structural integrity. Those poles and wires had to cross some of the most rugged terrain in America, swamps, deserts, mountains, and so forth for anyone around; therefore rigid standards were established. Products were tested and specified. Construction was tightly monitored. Policies and procedures were developed. Field personnel continues to observe the system.

Mr. Chairman, those rigid standards are still a part of the process and requirements today. A track was laid for a strong system, and the agency has stayed on track. An example of how that has worked so very well is the disaster of Hurricane Katrina. Many electrical systems were down on the ground. A large percentage were electric co-ops. When crews from co-ops from many parts of the USA came to help, they needed only to be shown where to begin work.

They knew the system. They came with trucks loaded with materials from their own warehouses that met the established standards, and they went to work. The systems were put up very quickly. Being strong systems that have a consistent standard means that even in disaster, system reliability exists.

Mr. Chairman, lest I over-speak, there is still work to be done. The expected growth in kilowatt hours means more capacity is needed. More capacity means more poles and wire for growth. Upgrades on existing systems will be necessary. Some upgrades because of the age, and some because of the desire to avoid being down, and some just to increase capacity on what is already there.

We can get these things done. In fact, we are getting these things done. We will make over $6 billion in loans this year to these sys-

tems for growth and improvement. With this work being done, there is however another big hurdle: transmission. We believe that transmission is the biggest challenge to the growth and reliability we have. The same quality rules that apply to distribution and generation systems also apply to transmission. That is not a concern. The concern is that transmission affects every aspect we can discuss here at the hearing.

We can build distribution systems. We can build generation systems. We can build massive renewable systems, but if we can't transmit the power to the place where it is needed, we really haven't accomplished much. The transmission challenges are extensive. Who owns it? Who finances it? How does the investment get repaid? Who controls the on and off ramps? Each state's regulations are different, and the list goes on.

My new friend, Ms. Cynthia Marlette from the Federal Energy Regulatory Commission—we discussed this earlier—will have more to say about this and from a better perspective that I ever could.

Mr. Chairman, no one wants these transmission systems and long spans of wire on their property. I don't, and you don't. The Rural Electric Cooperative serves 75 percent of the land mass in the U.S. which means much, if not most, of this transmission will be built in rural service areas. We finance, provide the regulations, and provide environmental studies but not the direction nor the location of these wires and poles.

The systems are in good shape and are reliable physically. The standards are in place to guide the future as they have in the past. The challenges are to keep doing what we have been doing, and to find a way to expand the transmission grid to support our growth and with the agreement of the landowners.

Generation from renewable sources will be necessary to supplement other forms of generation. These renewable sources will most probably be located in more remote places, and transmissions must get these resources to market.

Mr. Chairman, please accept this oral statement and my more detailed written statement as my background for any questions the Committee may have. Thank you.

[The prepared statement of Mr. Andrew follows:]

PREPARED STATEMENT OF HON. JAMES M. "JIM" ANDREW, ADMINISTRATOR, RURAL DEVELOPMENT UTILITIES PROGRAMS, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Mr. Chairman, Members of the Committee, thank you for inviting me to discuss electric power generation and reliability issues in rural America.

The demand for new generation capacity in rural areas is increasing just as it is in the urban centers. The last significant industry wide build-out of baseload electric generation plants occurred during the 1970–1985 timeframe. Since that time, the industry has moved from a situation of surplus capacity to the current period in which most utilities are forecasting the need to build new baseload capacity to meet the requirements of their customers; in the case of rural electric cooperatives that means the member/owners of the system. Because of the significant lead time necessary for the addition of new baseload capacity, many utilities, including cooperatives, are not expanding at a rate necessary to meet the anticipated demand for electricity.

Baseload generation means those plants that are designed to be operated 24 hours per day, 7 days per week. They are shut down only for required maintenance. Most baseload plants are generally fueled by either coal, nuclear power, or natural gas. When baseload plants cannot meet demand, intermediate facilities are started.

These are typically fueled by natural gas and can be started as quickly as needed. The last in line are peaking plants that are also fueled by natural gas and also can be started quickly.

According to a recent survey of Electric Cooperative Generation and Transmission borrowers conducted by the National Rural Electric Cooperative Association projects that due to electric load growth, many electric cooperatives will need to double generation capacity by 2020. Virtually no additional capacity was added during the 1990s and early in this century due to surplus capacity and the efforts to deregulate the electric power industry during the mid to late 1990s. Deregulation attempts created an atmosphere of uncertainty that the existing customer base would be there to ensure repayment of the investments.

During this period, the electric cooperative side of the industry attempted to keep pace with demand by investing in smaller natural gas peaking and intermediate facilities which are less costly to build, but can be very expensive to operate at times when the price of natural gas spikes. Cooperatives also met customer demand by entering into power purchase contracts with other suppliers. Many of these contracts will expire in the near future; some as soon as 2011.

Since 2000, the uncertainty associated with deregulation of the industry has waned. This combined with favorable interest rates encouraged Electric Program generation and transmission borrowers to begin developing plans for investments in new generation capacity. However, new uncertainties and challenges have since been introduced:

- There is much discussion that some form of carbon dioxide emission limits will be imposed.
- Legal challenges to environmental permits can be expected on any new baseload generation plant that has emissions.
- Costs of new plant construction are increasing substantially each year due to a variety of factors.

Current Generation Capacity and Peak Demand

Electric Program Generation and Transmission borrowers own 160 generating units totaling 38,604 megawatts of generation capacity of which roughly 59 percent is from coal fired steam plants and about six percent is represented by partial ownership in nuclear plants and approximately 32 percent is from primarily gas fired peaking or intermediate units.

Owned capacity represents 57 percent of the energy supplied to member distribution cooperatives. Purchases from other sources represent the other 43 percent. Generation and Transmission cooperatives attempt to maintain this balance between self-generation and purchased power to minimize risk and optimize their costs. If purchases can be secured at less marginal cost than that of operating a peaking or intermediate unit, the cooperative will opt for purchases to meet the requirements of its members.

One reason that 59 percent of the capacity owned by these cooperatives is coal fired is that following the OPEC oil embargo of 1973 Congress enacted the Power Plant and Industrial Fuel Use Act of 1978 which strictly limited the use of oil or natural gas to generate electricity. This encouraged investment to coal and nuclear energy during the last baseload construction cycle in the late 1970s and early 1980s.

Another reason that coal is the preferred fuel is cost. Currently, energy generated from coal is available at a median total cost of $34.02 per megawatt hour. Gas fired combined cycle plants produce energy at an average cost of $96.60 per megawatt hour while nuclear energy costs a little over $40 per megawatt hour.

U.S. Capacity Margins

The mission of the North American Electric Reliability Corporation (NERC) is to ensure that the bulk power system in North America is reliable. Under the oversight of the Federal Energy Regulatory Commission (FERC), NERC develops and enforces reliability standards; monitors the system; assesses and reports on future adequacy; and evaluates owners, operators, and users for reliability preparedness.

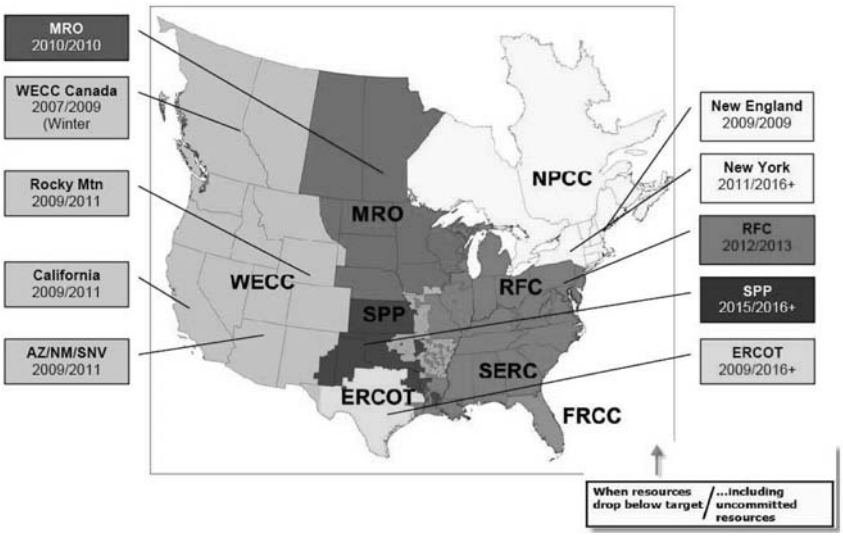
In October of 2007, NERC released a report on Long Term Reliability Assessment which contained the following key findings:

- Long term capacity margins are still inadequate;
- Integration of wind, solar, and nuclear resources require special consideration in planning, design, and operation;
- High reliance on natural gas in some areas of the country must be properly managed to reduce supply risk and delivery interruption;
- The transmission situation has improved, but more is still required; and

- The aging workforce is still a growing challenge.

According to the report, peak demand for electricity in the U.S. is forecast to increase by over 135,000 MW or 17.7 percent in the next ten years. Capacity is projected to increase by only 77,000 MW. Capacity margins will begin dropping below the recommended 15% above peak demand by 2009 and continue to decline to under 10% by 2016. The decline below 15% will occur first in the western third of the U.S. and Canada and in New England. A reserve of 15% is necessary to prevent brownouts or blackouts in case of unplanned outages of generation facilities, unusual weather events, or other unpredictable events occur.

The map below identifies the years when a region or sub-region drops below target capacity margin levels required to meet summer peak (unless noted as winter) including both committed and uncommitted resources. Those regions or sub-regions not identified are not projected in the next ten years to drop below their target margin levels. Source: NERC.



U.S. and Rural Electric Generation and Transmission Forecasted Generation Capacity Additions

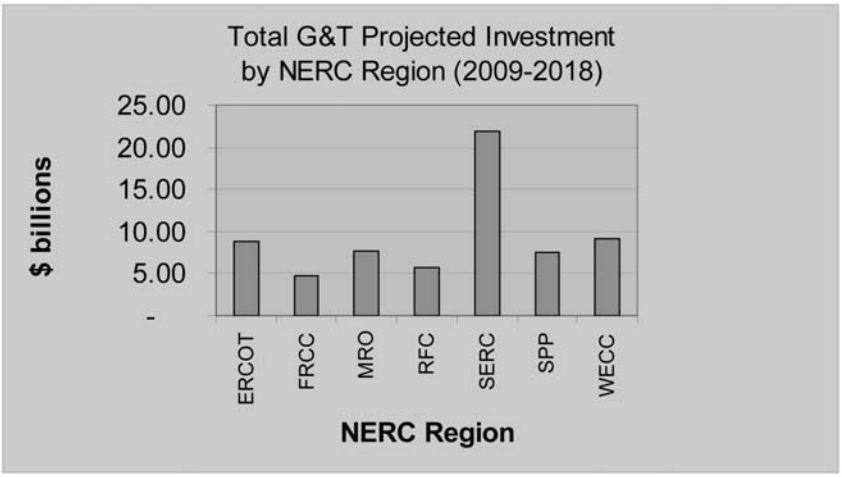
The U.S. Department of Energy's Annual Energy Outlook for 2008 forecasts electricity consumption to grow from 3.8 billion kilowatt hours (KWh) in 2006 to almost 5 billion KWh in 2030, an annual rate of increase of 1.1 percent. The 2008 forecast is lower than the 2007 forecast of 1.5 percent annual increase due to slower economic growth, higher electricity prices and the enactment of new efficiency standards in the Energy Independence and Security Act of 2007.

The Cambridge Energy Research Associates, a private research firm, estimates the U.S. electric power industry will invest $900 billion in new utility plants over the next 15 years. This level of investment surpasses the total net plant in service today. This total includes $350 billion for new generation, $300 billion for distribution, $150 billion for transmission, $50 billion for conservation and efficiency and $50 billion for environmental retrofits (not including CO_2 abatement).

Rural Areas

Presently, rural electric Generation and Transmission cooperatives generate about 5% of the energy produced in the U.S. Every year the National Rural Electric Cooperative Association (NRECA) surveys its cooperative members regarding their planned capacity additions. The most current survey indicates a 10 year capital requirement of $65.5 billion, $49.9 billion of which is specifically for new generation projects. Ten billion dollars is needed for new transmission and almost $3 billion is needed for environmental retrofits.

Total Projected Investment By NERC Region



The NRECA 2008 survey also projects significantly higher capacity needs 8,000 additional megawatts over last year's projection due primarily to the timing of larger investments in baseload generation that have been shifted to later years. The survey results suggest that the needs in the shorter term will be filled with natural gas fired peaking and intermediate units. The delay in the construction of baseload coal and nuclear facilities is a reaction to the uncertainties of increasing construction costs, legal challenges, financial risks for first-movers, and proposals to regulate carbon dioxide emissions.

While adding natural gas fired units in the short term is not seen as an optimal solution, this capacity will aid in meeting the energy requirements of cooperative consumers. The price of natural gas has been volatile and steadily increasing since 2000 and additional demand will add to the price volatility.

Construction Cost

According to the Cambridge Energy Research Associates Power Capital Cost Index, the cost of new power plant construction has increased 130% during the past 8 years with almost 70% of the increase occurring since 2005. The demand for construction material in China and India is a huge factor, but other supply constraints and increasing labor cost are also key factors. Earlier this year, one of the Generation and Transmission Cooperative borrowers shelved a coal-fired project that had been in the planning stage for 3 years because the projected cost had risen from $1.4 billion to over $1.8 billion.

The time horizon for large baseload generation plants can easily be ten years from the beginning of planning to commercial operation; construction time alone can be 4 years. Making investment decisions with these time horizons is very difficult given the uncertainties discussed above. Adding to these uncertainties are the current disruptions in the commercial financial markets.

Financing Options and Costs for Generation and Transmission Cooperatives

Sixty-eight percent of long-term debt held by Generation and Transmission cooperatives has been provided by Rural Development Electric Program loans and guarantees. For most of these entities, this source of financing is the preferred option due to the lower interest rates and term length differences between government financing and commercial capital.

On average, the cost of energy represents 65% of the electric bills at the rural retail level. Primarily residential, rural electric distribution cooperatives serve an average of 7.0 consumers per mile of distribution line compared to 35.1 for investor owned utilities and 46.6 for municipally owned systems. Translated into revenue per mile of line distribution, cooperatives average $10,565 compared to $62,665 for investor owned utilities and $86,302 for municipally owned systems. Due to the low density of the customer base, the cost of energy, and the fact that most of the energy used is for residential needs (translates to less than a 50% load factor), the rates

paid by rural distribution cooperative consumers average about 10% higher than neighboring investor owned and municipally owned systems. For these reasons, it is imperative that the Generation and Transmission cooperatives seek the least costly source of capital for their members.

We are currently financing intermediate and peaking generators, improvements and pollution control improvements to existing generation plants, transmission, and renewable energy projects, as well as distribution system improvements. In Fiscal Year 2008, the electric program will provide a total of $6.6 billion for these needs.

These types of improvements involve minimal risk to the government so there are virtually no subsidy costs associated with these investments. Another factor contributing to low subsidy rates is the fact that there is less than 1/10 of one percent delinquency rate on the Rural Development Electric Loan Program's portfolio exceeding $36 billion.

Renewable Energy

Renewable energy, including hydropower, accounts for approximately eight percent of the nation's electricity production while coal and nuclear combine to total 68 percent and natural gas 22 percent. For electric cooperatives, renewable energy, primarily large hydroelectric facilities, accounts for 11 percent, coal accounts for 62 percent, nuclear 15 percent, natural gas 10 percent and diesel fuel two percent. Renewable energy is becoming a larger portion of the cooperative's energy portfolio.

Presently 80 percent of the 900 rural electric cooperatives supply some of their electricity needs from renewable sources, owning or purchasing 1,415 megawatts, primarily wind. A little over 1,000 additional megawatts, composed of wind and woody biomass, is being planned. Close to 150 cooperatives either own wind turbines or purchase output from wind farms. Basin Electric based in North Dakota purchases 136 megawatts from three commercial wind farms and is planning to build and own another 200 megawatts of wind energy.

Renewable Portfolio Standards (RPS) adopted by several states have had a significant impact on the deployment of renewable generation. Twenty-six states and the District of Columbia have passed RPS requiring utilities to add increasing amounts of renewable energy ranging from 10 to 25 percent of their energy mix. Other states have adopted renewable goals rather than mandates.

To a large extent, renewable energy resources are found in remote rural areas. Fully developing those resources and delivering the energy to market centers will require substantial investments in transmission capacity, both in terms of delivering renewable energy to the transmission grid and increasing the capacity of the grid to handle increasing loads.

We are currently working with Generation and Transmission cooperatives as well as private developers of wind and biomass projects on additional projects that will total well over $1 billion in financing. The success of these projects will drive additional investments in the future. The availability of the production tax credit, favorable depreciation rates, and Clean Renewable Energy Bonds are making renewable energy more price-competitive. This is in-turn stimulating increasing interest in developing renewable energy projects with the assistance of the Rural Development Electric Program.

Additionally, several rural electric generation and transmission CEOs recently announced the formation of a national cooperative dedicated to the development of renewable energy sources. A national effort was deemed necessary because some areas of the country do not have sufficient renewable resources for generation of electricity. For example, generation cooperatives in the South and Southeast that have limited wind resources can participate in wind projects developed in the Great Plains through equity contributions.

Wind and solar energy will continue to increase as important components of the energy mix, however, they should not be considered as baseload capacity resources because they can not generate electricity 24/7. This has been best stated by the American Wind Energy Association; "It is an energy resource. You take the wind when nature delivers it and rely on other system resources when it is not available." Biomass renewable sources such as waste wood can be operated as baseload resources.

Energy Efficiency

The cooperative segment of the electric industry has been recognized nationally a leader in energy efficiency and demand side management practices. These practices reduce demand and help mitigate the need for new electric generation capacity. Most distribution cooperatives offer incentives, rebates and other assistance such as free energy audits for residential, commercial and industrial consumers. Many distribution cooperatives also participate in the Electric Programs Energy Conservation

Program (ERC) which offers deferral of principal payments on debt for this purpose. This enables the cooperative to use those funds to assist consumers seeking to install energy efficient appliances or other energy saving measures. A very popular and successful effort is the installation of geothermal ground loop systems replacing inefficient heating and air conditioning systems. The upfront cost of these systems can be prohibitively expensive for many homeowners, but with the assistance of the ERC program, the cost to the home owner can be reduced to affordable levels.

Recently, two cooperatives in Alabama and Kentucky and the Hawaii Habitat for Humanity Office were awarded High Energy Cost Grants, administered by the Electric Program, to assist low income homeowners to install energy efficiency measures to reduce their energy bills. A previous grant to the Alabama cooperative proposes to assist 100 very low income home owners repair or replace duct work, install energy efficient appliances, replace inefficient furnaces and central air conditioners with highly efficient heat pumps, install insulation, and install energy efficient doors and windows. These efforts not only reduce the energy bills of the home owner, but also reduce the amount of energy the cooperative has to purchase to serve those homes. One example shows the home owner monthly electric bill decreasing from 3,979 kwh per month to 2,080 kwh per month, a 48 percent reduction.

Carbon Emissions

As legislation designed to reduce the amount of greenhouse gas emissions is being considered, we must keep in mind that the intermittency of wind and solar energy means that we cannot depend on those resources for capacity reliance. There must be other energy sources available for those times that wind and solar sources are not available.

This was demonstrated rather dramatically earlier this year in Texas when wind production of electricity in west Texas unexpectedly dropped by 75% while simultaneously late afternoon peak demand rose by over 2,000 megawatts as people returned home from work. In order to avoid brownouts, the Electric Reliability Council of Texas (ERCOT), the entity that manages the transmission grid in Texas, called interruptible customers, typically large commercial or industrial customers, and asked them to reduce their demand and simultaneously started up natural gas fired peaking facilities to generate additional power to balance supply and demand. Compounding the problem was that some baseload units were not generating power due to planned outages for maintenance or other reasons. All of this occurred in a matter of minutes.

Occurrences such as this one lead us to believe that any approach to limiting carbon emissions should be balanced in order to maintain system reliability, sustain economic growth and provide time for the appropriate technologies to be developed. This includes a balanced mix beginning with energy efficiency and renewable resources, additional nuclear capacity, advanced clean coal generation, carbon capture and storage, plug-in-hybrid vehicles, and distributed energy resources.

The Rural Development Electric Program intends to assist Basin Electric Cooperative in North Dakota install carbon capture technology at an existing coal fired generation plant. This technology will remove a portion of the carbon dioxide and feed it into an existing CO_2 compression and pipeline system owned by Basin from which it will be sold for enhanced oil recovery in North Dakota and Canada. Smaller portions of CO_2 will be taken out of the pipeline and injected into a non-recoverable coal seam and a saline formation to test sequestration capability of those geologic formations. Our goal is to help further the advancement of these technologies.

Conclusions

The system reliability concerns identified in the NERC report, as well as other reports, point out that brownouts are probable unless we begin now to increase investment in transmission. Simultaneously, we must intensify energy efficiency efforts and add new generation sources beginning with additional renewable resources. But we also need to add baseload plants. The lead time associated with planning and constructing new baseload plants can easily consume 8 to 10 years and the country is already behind the demand curve.

Ensuring reliability of the system and adequate supply is going to be costly and consequently consumer rates may increase. However, the economic cost of brownouts could be higher due to interruptions of commerce. Our economy is highly dependent on reliable electricity and that dependence is growing as more of the economy shifts to the service sector and as we move to energy independence. The development of alternative transportation fuels, regardless of the feedstock, will also require significant sources of new electric generation.

Mr. Chairman, thank you for the opportunity to present our views on rural electric generation needs and the reliability of the electric system. I would be pleased to answer any questions the Members of the Subcommittee have.

The CHAIRMAN. Thank you, Mr. Andrew. Ms. Marlette.

STATEMENT OF CYNTHIA A. MARLETTE, GENERAL COUNSEL, FEDERAL ENERGY REGULATORY COMMISSION, WASHINGTON, D.C.

Ms. MARLETTE. Mr. Chairman and Members of the Subcommittee, thank you very much for the opportunity to be here today. I appear before you today as a staff witness of the Federal Energy Regulatory Commission, and I don't speak for the members of the Commission.

My testimony today focuses on the Commission's limited jurisdiction over rural electric cooperatives and also discusses Commission policies that may affect the provision of service by electric cooperatives.

As a general matter, the Commission has relatively little authority over the majority of electric cooperatives. We generally have no authority to regulate the rates and services of distribution-only utilities of any kind, including distribution cooperatives. To the extent the cooperatives engage in wholesale sales or transmission in interstate commerce, the Commission has authority to comprehensively regulate those activities only if the utility does not receive funding under the Rural Electrification Act of 1936 and the cooperative sells 4 million or more megawatt hours of electricity per year.

Of the over 900 electric cooperatives in the United States, at this time, the Commission regulates only 15 of those cooperatives. However, the Commission does have certain limited authorities that apply to REA-financed cooperatives. This includes authority to order them to provide interconnection and transmission access to their facilities, authority to enforce compliance with the mandatory reliability standards for the bulk power system, authority to sanction market manipulation by any entity in connection with Commission jurisdictional transactions, and certain authority to require any market participant to disseminate to the public information regarding the availability and pricing of wholesale electric energy and transmission service.

Although the Commission's authorities are limited over cooperatives, cooperatives have long been very active participants in Commission proceedings involving investor-owned public utilities. They have also been very active in our generic rule-making proceedings involving interconnection and transmission access as well as our rulemakings to implement the new reliability provisions and backstop transmission siting authority given to the Commission in the Energy Policy Act of 2005.

The Commission's policies clearly can affect cooperatives and the consumers they serve, particularly as the Commission and industry participants address the challenges ahead in developing new electric transmission infrastructure and meeting the future power needs of the nation's consumers.

Among the policies and requirements that most affect cooperatives, there are five that I would highlight for you. First, electric cooperatives have the ability to use the open access transmission

tariffs of Commission-regulated public utilities to obtain transmission services. Open access tariffs allow customers to obtain transmission service on a nondiscriminatory basis, whether to sell their own power or to go out in the market and shop for power to serve their customers.

The Commission, last year, updated the open access service obligations including a requirement to offer new service options for long term firm customers.

Second, electric cooperatives have the ability to interconnect their generating facilities with the interstate transmission grid through standardized nondiscriminatory procedures and agreements that are required to be used by Commission-regulated public utilities.

These procedures and agreements vary depending on the size and nature of the generating facility, and they provide flexibility for small facilities and for non-synchronous technologies such as wind power.

Third, last year the Commission directed all public utilities to develop and implement transmission planning processes that allow for customers, both on a local and regional level, to be involved in the transmission planning process. In adopting this reform, the Commission noted that particular emphasis was given by Congress in the Energy Policy Act to development of transmission infrastructure.

By opening up the transmission planning process and granting customers access to planning-related studies and information, the Commission has tried to ensure that investments in transmission infrastructure are made in coordination with the customers being served, including electric cooperatives.

Fourth, pursuant to the directive of Congress in the Energy Policy Act of 2005, the Commission has provided rate incentives to public utilities for new transmission infrastructure that is needed to ensure reliability and to reduce the cost of delivered power by reducing congestion on the transmission system.

With new transmission, however, comes the very difficult issue of cost allocation. Who pays for the new transmission facilities that are needed? The Commission has encouraged regional, consensual solutions for addressing cost allocation issues, including the particular challenges that are associated with transmission facilities that are needed to reach remote location-constrained resources such as wind facilities.

Fifth, the Commission has supported the continued development of competitive wholesale power markets including the voluntary formation of regional transmission organizations to operate the transmission system and energy spot markets on a nondiscriminatory basis. These institutions help to serve as a focal point for regional solutions including transmission planning and dealing with the cost allocation issues I mentioned.

Finally, I would note that outside the context of the Commission's economic regulation affecting cooperatives, the Commission also is responsible for licensing non-Federal hydropower projects that are located on navigable waters or Federal lands or connected with the interstate grid.

This includes licenses for electric cooperatives and to date, we have 14 electric cooperatives who have sought and obtained hydropower licenses from the Commission for 21 hydropower projects.

This concludes my oral statement, and I would be happy to answer any questions you might have.

[The prepared statement of Ms. Marlette follows:]

PREPARED STATEMENT OF CYNTHIA A. MARLETTE, GENERAL COUNSEL, FEDERAL ENERGY REGULATORY COMMISSION, WASHINGTON, D.C.

Mr. Chairman and Members of the Subcommittee:

Thank you for the opportunity to be here this morning to discuss the provision of reliable electric service in rural America. My name is Cynthia Marlette, and I am General Counsel of the Federal Energy Regulatory Commission (Commission or FERC). I am appearing before you as a staff witness and do not speak for the members of the Commission.

My comments today will focus on the Commission's limited jurisdiction over rural electric cooperatives and on Commission policies that affect the provision of service by electric cooperatives.

As a general matter, the Commission has relatively little authority over the majority of rural electric cooperatives. It generally has no authority to regulate the rates and services of distribution-only utilities of any kind, including distribution cooperatives. To the extent a cooperative engages in wholesale sales of electric energy or transmission in interstate commerce, the Commission has authority to comprehensively regulate those activities only if the cooperative does not receive funding under the Rural Electrification Act of 1936 (REA) and the cooperative sells 4 million or more megawatt hours of electricity per year. Of the more than 900 electric cooperatives in the United States, at this time only 15 are subject to such regulation by the Commission.

However, the Commission does have certain limited authorities that apply to REA-financed electric cooperatives and other "non-jurisdictional" entities. This includes authority to order them to provide interconnection and transmission access, authority to enforce their compliance with mandatory reliability standards for the bulk power system, authority to sanction manipulation by any entity in connection with Commission-jurisdictional transactions, and certain authority to require any market participant to disseminate to the public information regarding the availability and pricing of wholesale electric energy and transmission service. Additionally, electric cooperatives have long been power customer participants in FERC proceedings involving investor-owned public utilities, and the Commission's policies clearly can affect rural cooperatives and the consumers they serve. These matters are discussed in further detail below.

Regulation of Public Utilities Under the Federal Power Act

The Commission's primary jurisdictional responsibilities involving the electric industry are found in the Federal Power Act (FPA). Under the FPA, the Commission regulates the rates, terms and conditions of wholesale sales of electric energy and transmission in interstate commerce by public utilities. It also regulates certain corporate activities of public utilities and public utility holding companies. Most public utilities are investor-owned companies. They do not include governmental entities (such as municipal utilities, state power agencies and Federal power marketing agencies) or REA-financed cooperatives. The FPA defines a public utility to include individuals and corporations that own or operate facilities used for wholesale sales of electric energy in interstate commerce, or for transmission of electric energy in interstate commerce. While some electric cooperatives meet this definition, the Commission historically interpreted the FPA to exempt from public utility regulation those electric cooperatives receiving REA financing. In 2005, Congress codified and expanded this exemption by amending the FPA to expressly exclude from the Commission's general FPA authority electric cooperatives that either receive REA financing or sell less than 4 million megawatt hours of electricity per year. As a result, the vast majority of electric cooperatives are now expressly excluded from rate regulation under the FPA.

For the handful of electric cooperatives that no longer have REA financing and that sell 4 million or more megawatt hours of electricity per year, the Commission must find the rates, terms and conditions of their wholesale power sales and transmission in interstate commerce to be just, reasonable and not unduly discriminatory or preferential, and their rate schedules or tariff authorizations must be on file at

FERC. These electric cooperatives are also subject to regulation of some of their corporate activities. As noted above, only 15 of the over 900 electric cooperatives in the United States are subject to regulation by the Commission as public utilities under the FPA.[1]

Other Regulation Under the Federal Power Act

While most rural electric cooperatives are not subject to FERC regulation as public utilities, they may nonetheless be subject to certain provisions of the FPA that apply more broadly to the wholesale sale or transmission of electric energy in interstate commerce. Major provisions affecting electric cooperatives are discussed below.

FPA Sections 210 and 211 Interconnections and Transmission Service

Under FPA section 210, the Commission may order on a case-by-case basis the physical connection of certain generation and transmission facilities upon request and a determination by the Commission that, among other things, such interconnection is in the public interest. Under FPA section 211, the Commission may order the provision of transmission service upon request and, again, a determination that, among other things, the service is in the public interest. Any person that sells electric energy is subject to the possibility of a mandatory interconnection order under section 210. Any entity that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce and for the sale for electric energy at wholesale is subject to the possibility of a transmission order under section 211.

Sections 210 and 211 therefore apply not only to public utilities but also to government-owned utilities and electric cooperatives. This means that the Commission, upon application by an eligible wholesale power seller or power customer, may order cooperatives to provide access to, and transmission over, their wires. Similarly, cooperatives as customers have the ability to request such service from public utilities as well as otherwise non-jurisdictional entities by filing requests pursuant to sections 210 and 211. While the Commission has exercised its authority under section 210 and 211 to require public utilities to provide service to electric cooperatives on several occasions, the Commission to date has not directed an electric cooperative to provide service to others under sections 210 or 211.

Open Access Transmission and FPA Section 211A

Electric cooperatives also have certain transmission-related rights and obligations under the Open Access Transmission Tariff (OATT) required to be filed by public utilities pursuant to the Commission's Order No. 888, issued in April 1996. In that order, the Commission required all public utilities that own, control or operate facilities used for transmitting electric energy in interstate commerce to offer non-discriminatory service on their transmission facilities pursuant to an OATT on file with the Commission. It also obligated such public utilities to "functionally unbundle" their generation and transmission services. This meant public utilities had to take transmission service for their own new wholesale sales and purchases of electricity under the open access tariffs and to separately state their rates for wholesale generation, transmission and ancillary services. Electric cooperatives that are wholesale sellers or wholesale buyers of electric energy may use the OATTs filed by public utilities to access transmission service on a non-discriminatory basis. This means that they, like other market participants, can reach alternative suppliers and buyers using the transmission systems of public utilities regulated by the FERC.

Last year, the Commission revisited the terms and conditions of the OATT and adopted several reforms to ensure that it continues to achieve its core objective of remedying undue discrimination in the provision of transmission service. Of particular interest to rural electric cooperatives, the Commission directed transmission providers to implement new service options for long-term firm point-to-point customers, increasing the ability to obtain transmission service when capacity is limited. The Commission also relaxed penalties for imbalances created by intermittent resources (such as wind) delivering power to the grid. The Commission directed transmission providers to implement open and coordinated processes for transmission planning and to develop consistent practices governing the calculation of available transfer capability (ATC). Taken together, these and other reforms adopt-

[1] These electric cooperatives are: ACES Power Marketing LLC; American Cooperative Services Inc.; Continental Electric Cooperative Services, Inc.; Cooperative Energy Incorporated; Energy Cooperative of New York, Inc.; Energy Cooperative of PA, Inc.; Georgia Energy Cooperative; Golden Spread Electric Cooperative, Inc.; GS Electric Generation Cooperative; Newcorp Resources Electric Cooperative, Inc.; Old Dominion Electric Cooperative, Inc.; PNGC Power; Rainbow Energy Marketing Corp.; Wabash Valley Power Assoc.; and, Wolverine Power Supply Cooperative.

ed by the Commission will better enable customers, including electric cooperatives, to obtain nondiscriminatory transmission service from public utilities.

It is important to note that, while the OATT obligations do not apply directly to most electric cooperatives, as a condition of an electric cooperative (or any other entity) taking service from a public utility under its open access tariff, the cooperative has an obligation to provide reciprocal transmission service to the public utility if the cooperative, or its affiliate, owns or controls transmission facilities. Unless the electric cooperative obtains a waiver of its obligation to provide reciprocal service, denial of service by the cooperative may result in denial of service by the public utility. Approximately 40 electric cooperatives have sought and obtained a full or partial waiver of the obligation to provide reciprocal transmission service. The Commission also established a voluntary "safe harbor" process whereby non-jurisdictional entities such as electric cooperatives could voluntarily submit their own OATTs to the Commission in order to meet the reciprocity condition and thus help avoid public utility complaints that they are not providing reciprocal service. Nine electric cooperatives have voluntarily submitted open access tariffs to satisfy their reciprocity obligations.[2]

To address the Commission's lack of direct jurisdiction to order electric cooperatives and other non-jurisdictional entities to provide non-discriminatory open access (i.e., access to all eligible customers) transmission services, in the Energy Policy Act of 2005 Congress provided the Commission with authority in new section 211A of the FPA to direct unregulated transmitting utilities to provide transmission service to third parties on a basis that is comparable to the service they provide themselves, at rates that are comparable to those they charge themselves. This authority is in addition to the open access reciprocity condition contained in public utility open access tariffs and the Commission's authority to order transmission on a case-by-case basis under FPA section 211, discussed above. Section 211A can be applied, however, only to those unregulated transmitting utilities that sell 4 million or more megawatt hours of electricity per year. To date, the Commission has found the voluntary reciprocity approach sufficient and no electric cooperative has been directed to provide transmission service pursuant to new section 211A.

FPA Section 215 Mandatory Reliability Standards

All users, owners and operators of the bulk power system, including electric cooperatives, are now subject to mandatory reliability standards approved by the Commission pursuant to section 215 of the FPA, which was enacted by Congress in the Energy Policy Act of 2005. There currently are 94 mandatory reliability standards that have been developed by the North American Electric Reliability Corporation (NERC) and approved by the Commission after receiving notice and comment from industry participants, including electric power cooperatives. Under section 215, NERC may impose penalties for violations of these mandatory reliability standards, subject to review by the Commission, or the Commission itself may impose such penalties directly.

FPA Section 220 Electricity Market Transparency

The Energy Policy Act of 2005 directed the Commission to facilitate price transparency in markets for the sale and transmission of electric energy in interstate commerce and authorized the Commission to issue rules requiring any market participant to disseminate to the public information regarding the availability and prices of wholesale electric energy and transmission service. This permits the Commission to require information to be provided by otherwise non-jurisdictional entities such as electric cooperatives, unless they have a *de minimis* market presence. However, the Commission to date has not issued any rules or orders under this new authority.

FPA Sections 221 and 222 Prohibitions on Filing False Information and Energy Market Manipulation

The Energy Policy Act of 2005 granted the Commission authority to prosecute the willful and knowing reporting to a Federal agency of false information related to the price of electricity sold at wholesale or the availability of transmission capacity if the person or any other entity knew the information to be false at the time of the reporting and intended to fraudulently affect the data being compiled by the Federal agency. It also gave the Commission authority to sanction the use of manipulative or deceptive devices in connection with the purchase or sale of electric energy or

[2] These electric cooperatives are: Basin Electric Power Cooperative; Big Rivers Electric Corporation; East Kentucky Power Cooperative; Hoosier Energy Rural Electric Cooperative; Southern Illinois Power Cooperative; Southwest Transmission Cooperative; Sunflower Electric Power Corporation; Tri-State G&T Association; and, Umatilla Electric Cooperative Association.

transmission subject to the Commission's jurisdiction. These provisions apply to any entity and, therefore, prohibit electric cooperatives from engaging in such false reporting or manipulative behavior.

Policies for Interconnecting Generators to the Transmission Grid

In order to facilitate the interconnection of new generation facilities to the transmission grid, the Commission has adopted standard procedures and agreements for the interconnection of generation facilities with the transmission facilities of jurisdictional public utilities. In the past, transmission providers with their own generating facilities had the incentive and ability to deny, delay, or make expensive the interconnection of rival generating facilities. The Commission eliminated that ability of public utilities to discriminate through a series of rulemaking proceedings to standardize the generator interconnection process. The resulting procedures and agreements vary depending on the size and nature of the generation facility, providing flexibility for small facilities and non-synchronous technologies, such as wind plants. Taken together, these standardized procedures and agreements offer comparable, open access to rival generators, including electric cooperatives seeking to interconnect with their local transmission provider. It should be noted, however, that the Commission's interconnection authority extends only to transmission facilities. It does not extend to local distribution facilities that are not used for wholesale sales.

Recently, the Commission has expressed concern regarding the growing backlog of generator interconnection requests. In some regions, many interconnection requests that are pending in study queues appear to be for speculative or unlikely projects. Because interconnection requests are studied on a first come, first served basis, the resulting backlog in study queues is causing delay for projects that wish to move forward. This problem seems to be particularly prevalent in markets operated by regional transmission organizations (RTOs) and independent system operators (ISOs), which have attracted significant new entry to the marketplace. RTOs and ISOs are nonprofit entities that, except for the ERCOT region of Texas, are regulated by the Commission as public utilities. They operate transmission facilities within a single state or within a region encompassing many states. They are not affiliated with any market participant and provide non-discriminatory access to the interstate transmission grid. They also operate organized real-time energy markets, and some also operate day-ahead markets.[3] Earlier this year, the Commission provided guidance to RTOs and ISOs regarding possible reforms that could be implemented to alleviate the backlog in processing generator interconnections. In response, interconnection queue reform proposals have been filed by the California ISO and the Midwest ISO. The Commission acted on the California ISO proposal earlier this month, while the Midwest ISO proposal remains pending.

Regional Transmission Planning

As noted above, last year the Commission directed public utility transmission providers to update their open access tariffs to include an open, coordinated and transparent process for transmission planning. This reform bears special mention given that transmission planning is vital to ensuring that customers, including rural electric cooperatives, have robust and reliable access to markets. In the past, however, there were very few specific requirements regarding how customers should be treated in the transmission planning process. As a result, transmission providers had the ability to unduly discriminate when planning for system expansions, potentially favoring access to their own resources over those of their customers.

To remedy that potential for undue discrimination, the Commission directed all public utility transmission providers to develop and implement planning processes that allow for customer involvement on a local and regional level. In adopting this reform, the Commission noted the particular emphasis that Congress placed on the development of transmission infrastructure in the Energy Policy Act of 2005. By opening the transmission planning process and granting customers access to planning-related studies and information, the Commission has ensured that investments in transmission infrastructure are made in coordination with the customers that are being served.

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[3] Currently there are six such entities regulated by the Commission: California Independent System Operator Corp. (California ISO); ISO New England Inc. (ISO New England); Midwest Independent System Operator, Inc. (Midwest ISO); PJM Interconnection LLC (PJM); New York Independent System Operator, Inc. (NYISO); Southwest Power Pool, Inc. (SPP).

Incentives for New Transmission and Allocating the Cost of Transmission Upgrades

Pursuant to a directive from Congress in the Energy Policy Act of 2005, the Commission within 1 year of the statute's enactment put in place rules to provide incentive-based rate treatment for new transmission facilities. In new section 219 of the FPA, Congress specified that these incentives must be "for the purpose of benefitting consumers by ensuring reliability and reducing the cost of delivered power by reducing transmission congestion." A number of incentive requests have been filed under the new rules, some of which involved projects to allow location-constrained resources, such as wind power, to reach the transmission grid and other upgrades necessary to meet state renewable energy portfolio standards. These types of upgrades can benefit both suppliers and customers of renewable energy.

With the nation's need for new transmission facilities and upgrades comes the difficult task of determining who will pay for that investment. This can be a particularly difficult issue for remote facilities needing to interconnect from long distances. The Commission's policy has been to encourage regional, consensual cost allocation solutions where possible. As part of the open and transparent planning processes discussed above, the Commission directed public utilities to work with their stakeholders to address the issue of cost allocation for new projects that do not fall under existing rate structures. The Commission has acted on a number of filings by public utilities seeking to comply with these provisions, while others remain pending before the Commission.

Competitive Power Markets

In addition to the Commission's policies and requirements regarding open access, interconnection, transmission planning, and incentives and cost allocation for new transmission facilities, Commission policies supporting the development of competitive power markets also may affect rural electric cooperatives both as power buyers on behalf of their members and as power sellers in those markets. In recent years, the Commission has encouraged the creation of RTOs, discussed above, to operate the transmission system as well as operate real-time and day-ahead auction-based markets for the purchase and sale of wholesale electric power. Two-thirds of the United States population is supplied by wholesale markets operated by Commission-approved RTOs. Earlier this year, the Commission instituted a rulemaking proceeding to consider reforms to RTO markets that would improve their operation, ensuring that they remain competitive and responsive to the needs of customers.

In order for entities that are subject to the Commission's ratemaking jurisdiction to sell electric energy into an RTO-operated energy market, they must obtain authorization to sell power at market-based rates. Such authorization is considered on a case-by-case basis and requires a showing that the requesting entity and its affiliates lack market power. The Commission has permitted market-based rates for generation sales by a variety of sellers, including traditional investor-owned utilities, independent generators, and independent and affiliated power marketers. Entities located outside of the RTO markets, or selling under bilateral contracts, may also seek authorization to make wholesale sales at market-based rates, again upon a showing that they and their affiliates lack market power. Of the 15 electric cooperatives subject to the Commission's ratemaking jurisdiction, all but one have sought and obtained market-based rate authority.

Hydropower Licensing and PURPA

In addition to the Commission's ratemaking jurisdiction under Part II of the FPA, the Commission has additional responsibilities under Part I of the FPA regarding the licensing of non-Federal hydropower projects located on navigable waterways or Federal lands, or connected to the interstate electric grid. In order to grant a license, the Commission must ensure that the project to be licensed is best adapted to a comprehensive plan for developing the waterway for beneficial public purposes. To the extent an electric cooperative owns or operates a hydropower project, the licensing requirements of Part I of the FPA may apply. To date, 14 electric cooperatives have sought and obtained licenses from the Commission for 21 hydropower projects.

The Commission also has responsibilities under the Public Utility Regulatory Policies Act of 1978 (PURPA) to enforce the obligations of electric utilities to purchase electric energy from and sell electric energy to qualifying cogeneration and small power production facilities (QFs). Under PURPA, electric utilities were generally required to offer to purchase available energy from QFs, and to provide electric service to QFs, at just, reasonable and nondiscriminatory rates. These mandatory purchase and sale obligations apply to all electric utilities, which PURPA defines broadly to

include all entities selling electric energy. Electric cooperatives are therefore subject to the mandatory purchase and sell obligations imposed by PURPA.

In the Energy Policy Act of 2005, however, Congress amended PURPA to direct the Commission to lift the mandatory purchase and sale obligation if it finds, in effect, that there is a sufficiently competitive market for the QF to sell its power. The Commission implemented this directive through a rulemaking proceeding in 2006, providing a process by which electric utilities may apply to be relieved of the requirement that they enter into new contracts or obligations for the purchase of electric energy from QFs. Prior to these reforms, a number of electric cooperatives had sought and obtained waiver from the Commission of the mandatory purchase and sale obligation. To date, no electric cooperative has requested termination of the purchase and sale obligation pursuant to the amendments adopted in the Energy Policy Act of 2005.

Conclusion

The Commission generally has no jurisdiction over distribution-only utilities, including rural distribution cooperatives. To the extent a cooperative engages in wholesale power sales or transmission in interstate commerce, relatively few of such cooperatives are subject to regulation by the Commission as public utilities.

The Commission does have limited authority over cooperatives under certain sections of the FPA, including interconnection and wheeling authority under sections 210 and 211, the enforcement of reliability standards under section 215, the wholesale market transparency provisions of section 220, and the prohibition of false reporting and manipulative behavior under sections 221 and 222. While the Commission has limited experience with, and jurisdiction over, cooperatives, its policies clearly can affect the consumers served by rural cooperatives. Cooperatives have nondiscriminatory access to transmission service under the Commission's open access policies, with corresponding obligations to provide service to public utilities from which they receive service. Cooperatives also may use the Commission's nondiscriminatory procedures for interconnecting generating facilities with the transmission facilities of public utilities. Further, they have access to competitive power markets, including the organized markets operated by RTOs, that enhance their ability to purchase and sell electricity generated from their resources.

To the extent an electric cooperative owns or operates a hydropower project, it may be required to obtain a license for that project under Part I of the FPA. To the extent it has not obtained a waiver from the Commission, an electric cooperative also will be required to offer to purchase and sell electricity to and from QFs under PURPA.

I would be happy to answer any questions that Members of the Subcommittee may have.

The CHAIRMAN. Thank you, Ms. Marlette. Mr. Andrew, can you elaborate on USDA's decision to suspend lending for coal-fired and nuclear-fired power plants?

Mr. ANDREW. In the early days of the 1970s and 1980s, a lot of generation was built, and we didn't have any subsidy rates established at that time. At this time when it became obvious that generation was going to be required to be built, we were trying to establish a subsidy rate to attempt to offset the cost of it. And we have a rate set, but we have not been able to get it in place. And the decision was made that we would not be able to make any generation, baseload generation that is, until we were able to assess a fee to convert the cost of the subsidy rate.

The CHAIRMAN. Mr. Andrew, can you possibly explain the difference between the approval process if a co-op was trying to finance a plant fired by coal for the environmental impact study compared to if they were seeking private financing, the difference in the concern for the community with environmental impact?

Mr. ANDREW. Well, for us, a coal-fired plant requires an EIS environmental study, which is a lengthy process. And I cannot speak to how that works if it is privately financed, but there is certainly some environmental process. But with us, it is very strict and to that degree it is one of the reasons that sometimes we are not get-

ting the loan requests that we had at one time because it does take a long time for environmental studies.

The CHAIRMAN. So you would have an extensive vetting process in an environmental impact study?

Mr. ANDREW. Yes.

The CHAIRMAN. And I know you said you couldn't answer this specifically, but probably private financing would be subject to some state rules and regulations?

Mr. ANDREW. Correct.

The CHAIRMAN. And finally, Mr. Andrew, the once a borrower, always a borrower has come under some recent criticism. I was just wondering if you think that policy should be changed? And are you able to keep your hands around some of these so-called bad actors that might be crossing the lines so to speak?

Mr. ANDREW. I do not think it should be changed, and the ones who have some notoriety, if you will notice were not borrowers of RUS. We have been able to monitor these things and keep a pretty tight rein on what goes on with our borrowers.

The CHAIRMAN. And you said you believe it should not be changed?

Mr. ANDREW. The once a borrower, always a borrower?

The CHAIRMAN. Yes.

Mr. ANDREW. It should not be changed, no.

The CHAIRMAN. Okay, thank you. Mr. Lucas.

Mr. LUCAS. Thank you, Mr. Chairman. Mr. Andrews, to follow up on the Chairman's comments about baseload issues, I suspect that there are a number of Members of this Committee like myself who were very disappointed that in the farm bill we were not able to rectify those issues as they dealt with RUS. One of the main comments I get from my constituents back home in the rural community is how do we maintain enough baseload.

And while I am a great proponent of wind energy, the wind only blows 40 percent of the time in Oklahoma, contrary to popular myth and belief back home. So you got to have baseload. Could you touch for a moment on what it means in rural America if we don't do something about the baseload generation issue?

Mr. ANDREW. As I understand it, generation is going to have to increase. Requirements in rural America are going to double by 2020, the capacity requirements. We need to get some more baseload. You mentioned wind and we mentioned other renewables which we are actively involved in now, and they will be developed. A lot of it will be developed. We have a lot of it under development right now. In fact, we have $1.6 billion worth of programs in-house that we are looking at now. They vary from wind to woody biomass to manure and so forth.

But the baseload generation, our estimation is that only 20 percent of the future requirements can be met by renewables. It has got to be provided by more baseload generation. During the time between the 1970s and early part of this century, we were able to get surplus power off the grid to make up what we needed to because we were short of baseload generation. We overbuilt frankly in the early 1970s and late 1980s.

So we were able to get that power off the grid thanks to some FERC regulations that allowed us to get onto the grid and take

power off. I know in my State of Georgia, we used to buy a lot of power out of Kentucky. But that power is gone now. It has been used up. We had one of our borrowers come in, and I asked him how much capacity was he building, was there going to be a surplus. And he said Jim, we are building for the year 1999. So it means that they have not built any baseload generation, and they need it desperately.

So we do need the baseload generation. Right now, we are supplementing with some intermediate load natural gas right now and some peaking turbines to pick up some of the slack. But the baseload—it takes a long time to build these things, and we can't wait a long time.

Mr. LUCAS. For the sake of the record then what we are saying is if wind, for instance, blows 40 percent of the time, the other 60 percent of the time, you got to have the power from somewhere. It is that other 60 percent that is the baseload, the stuff you count on because it will be there.

Mr. ANDREW. It is available 24 hours.

Mr. LUCAS. Twenty-four hours. And the issue in the farm bill, explain that again for the benefit of the record. Why it was important that we have legislation addressing those issues that didn't make it in there so we would be able to do baseload.

Mr. ANDREW. Well, in the farm bill, we were asking for the authority to assess a fee to cover the subsidy cost. The subsidy was estimated to be 1.92 percent, and 1.92 percent times $1 billion is quite a bit of money. The subsidy rate had to be appropriated. We asked all the generation transmission cooperatives if they would pay this as a fee up front. They agreed to. Therefore it would not be a cost to the government if we did baseload generation. But it was taken out of the farm bill so we are at that point now.

Mr. LUCAS. So by not having that language there, in effect it ties your hands?

Mr. ANDREW. Correct.

Mr. LUCAS. You can't be in the baseload business. It is not that you don't want to help expand base generation capacity, but mechanically the way the law reads right now, you can't do it.

Mr. ANDREW. That is right.

Mr. LUCAS. Is that a fair statement?

Mr. ANDREW. If Congress appropriated the funds, we could. But right now, I don't see that as a possibility.

Mr. LUCAS. And one more time for the record, no matter how much wind we put on, no matter how many solar panels we put up, the fact of the matter is if you don't have baseload generation, for instance in wind that proverbial 60 percent of the time when the wind is not blowing, or on a cloudy day even with solar, if you don't have that baseload, we have brownouts, we have problems.

Mr. ANDREW. Yes, sir. In my State of Georgia, for example, the wind only blows five percent of the time, and we are growing probably the fastest of any state in the Union at 10 percent a year. So we need it.

Mr. LUCAS. So this is a problem that won't go away?

Mr. ANDREW. It won't go away.

Mr. LUCAS. If we don't address the baseload issue, no matter how many good alternatives we use, we are fixing to slam into a wall somewhere in the near future.

Mr. ANDREW. Regardless of who makes the baseload loans, we got to have it.

Mr. LUCAS. Thank you, Mr. Andrew, Mr. Chairman.

The CHAIRMAN. The chair thanks the Ranking Member. The gentleman from Texas left. The gentleman from Colorado.

Mr. SALAZAR. Thank you, Mr. Chairman. I appreciate you having this hearing today. I guess my question, Mr. Administrator, is on transmission lines. In the San Luis Valley of Colorado where I live, we have one of the best places to produce solar energy. As a matter of fact, we have the largest solar farm in the country——

Mr. ANDREW. Yes.

Mr. SALAZAR.—presently. The problem that we have is transmission lines in and out of the San Luis Valley. In order to be able to encourage development of solar energy within that valley, we need those transmission lines. Can you talk about the feasibility of underground transmission lines *versus* overhead transmission lines? Because that is a big controversy with the EEIS or the environmental community.

Mr. ANDREW. Yes, I understand that, sir. And let me say that I am not an engineer, but I do know a little bit about that. The lines that you see overhead are not insulated. They are air cooled. So the capacity that those lines have is based on being able to be cooled by the air. If we have to put it underground, you have to insulate it, and it takes a larger wire to be insulated. Therefore, it could be very expensive.

I know in Colorado, our General Field Representative there tells me that a lot of developers have buried some transmission into their subdivisions, but they pay for it themselves. But long spans of it, Congressman Salazar, are going to be very expensive, and it is a matter of who pays for it.

Mr. SALAZAR. Okay, thank you, Mr. Chairman.

The CHAIRMAN. The chair thanks the gentleman. The gentleman from Kansas.

Mr. MORAN. Mr. Chairman, thank you very much. I appreciate the opportunity to hear more about impending challenges we face in the provisioning of power across our country.

A couple of specifics, Mr. Andrew, in regard to Kansas. First, Kansas has experienced a number of natural disasters, particularly in regard to electrical generation, with ice storms 2 years in the running. And at the moment, our rural electric cooperatives are in a debate with FEMA in regard to the nature of the cost returning those power lines and poles to a correct standard.

And it is my understanding that your agency has standards in regard to those transmission lines and poles, and that FEMA may have a separate standard. Do you know about this topic, and can you shed any light on that for me?

Mr. ANDREW. I just heard about this topic, and I can't shed a lot of light on it. But it is something that we need to deal with because we do have—as I said in my oral testimony, we do have rigid standards on how these things are built because we need for them to stand up.

And I understand that FEMA is dealing with costs, and that probably is where they are coming from.

Mr. MORAN. It is my understanding that FEMA determined that your standards were not what they call code-based, and therefore they did not want to use your standards in determining how to rebuild line sections.

And my guess is that—perhaps you can shed light on this—your standards, I assume, would be based upon some level of expertise about challenges that we particularly face in rural places in the country, long distances, lots of wind, snow and ice storms. Can you provide me with some justification for where your standards come from, in part, so I can visit with FEMA to tell them that they ought to be paying attention to what you are doing?

Mr. ANDREW. I understand, Congressman. And I was just advised that we are working with FEMA right now trying to iron these things out. And if you don't mind, I will get back to you with an answer.

Mr. MORAN. That would be satisfactory. Thank you very much. Second, a Kansas issue: We have received national attention on a decision by our state government to deny a couple of coal-fired plant permits, and again concern about baseload, in my opinion, concern about taking sources of energy off the table. In my opinion that is having significant consequences upon the price structure.

In fact, I recall reading in one of our newspapers that when the permits were denied, one of the quotes by an environmental group was this is a great day because it means electricity prices will be doubling in Kansas, and that means a lot more conservation. Doubling electricity prices in rural America or across the country has significant consequences to consumers, to economic growth, to job creation.

And I know that you are now involved in litigation in regard to the Sunflower permit process. My understanding of this is that RUS has little involvement in this project to build two new coal-fired plants. And I thought it might be useful for the record if you would place into the record the role that RUS now plays in financing Sunflower Electric Power Corporation.

Mr. ANDREW. We have no interest. We are not financing any of it.

Mr. MORAN. So as Sunflower requests permits to expand their capacity, they have not requested RUS to finance that expansion, true?

Mr. ANDREW. That is true.

Mr. MORAN. And you have originally some time ago financed operations at Sunflower. Is that true?

Mr. ANDREW. That is true.

Mr. MORAN. And when that occurred, was there an environmental assessment completed, impact statement?

Mr. ANDREW. Yes, it was, and that was in 1981.

Mr. MORAN. And at the moment, all RUS's relationship with Sunflower is that you are collecting payments on the debt they owe RUS. Is that true?

Mr. ANDREW. That is correct, and they are current.

Mr. MORAN. And I assume that there is a significant cost involved if RUS had to complete an environmental impact statement

any time any utility that you are financing, collecting debt from, would be an expensive process if they asked to do something more, and you were required to provide an impact statement for them to be able to do that.

Mr. ANDREW. Absolutely. It is very expensive, and sometimes we take as much as 15 or 16 months.

Mr. MORAN. Anything you would like to add to this conversation? Again as the Chairman indicated, there are some limitations since there is litigation. But anything you would like to say to kind of clarify the relationship with Sunflower and this litigation?

Mr. ANDREW. I am not sure that I can say much more than what you have asked me questions, because I had discussed with Counsel as to what you would like to know. And I don't think I am able to discuss anything further.

Mr. MORAN. I thank you. Thank you, Mr. Chairman.

Mr. ANDREW. Thank you.

The CHAIRMAN. The chair thanks the gentleman. The gentleman from Indiana, Mr. Donnelly.

Mr. DONNELLY. I have no questions at this time, Mr. Chairman.

The CHAIRMAN. The gentlewoman from New York.

Mrs. GILLIBRAND. Thank you, Mr. Chairman. And thank you both for coming in and testifying. This is a very important issue as energy issues are at the forefront of all my constituents' minds, and we want to be able to assure low-cost energy is available for the years to come. And my district in upstate New York is a largely rural one as well, so your work is essential to our communities.

What I would like to talk to you a little bit about today is oversight. You know I received a letter from my colleague Jim Cooper about the status of co-ops in America today, and he talks a little bit about how the purpose of the co-op system was to provide energy for rural areas, but that any excess revenue is supposed to return to customers in the form of capital credits and that noncompliance in this would actually lead to the co-ops—rather would threaten the co-op's tax-exempt status.

And Mr. Cooper highlights that co-ops nationwide have amassed $31 billion in excess capital credits, and 93 percent of co-ops now engage in business ventures beyond providing electricity. And he cites to three scandals throughout the country, one in Austin, Texas, Pedernales Electric Cooperative where executives were paid millions of dollars and wasted thousands and thousands of dollars of the public's money on frivolous personal expenses.

Another venture in Atlanta, Georgia where the executives subcontracted the entire operation to a for-profit entity that was secretly owned by the executives of the co-op. And a third one in Birmingham, Alabama where they had not held a Board of Directors election for 38 years.

So I would like you to comment a bit about what your oversight role is and whether it needs to be refined or expanded or whether more transparency is needed in the regulation and regulatory system.

Mr. ANDREW. First, let me say that the ones that you mentioned were not borrowers of RUS, and Pedernales or in Georgia are not borrowers of RUS. Therefore, we have no oversight of them whatsoever. And the activities——

Mrs. GILLIBRAND. But should you have oversight? I mean is the current oversight enough? Perhaps you should have oversight.

Mr. ANDREW. Over those two? Not over those two I wouldn't think. They are not borrowers of RUS, so we have no authority over them whatsoever. We do have authority—we have some oversight over the rest of them.

Mrs. GILLIBRAND. So FERC has the oversight?

Mr. ANDREW. You will have to let FERC answer that. But since they are not borrowers of ours, I would let FERC answer that question. We finance about 617 out of the 900 electric co-ops. Over the 617 we do have some oversight in that we see that they are financially stable, not how they elect their Board of Directors, nor how their Board of Directors operates their business. It is just like being elected to Congress. They are elected by the members, and they serve the will of the members.

So we don't have any authority over that. We do monitor. We have our field accountants. They go in there on a regular basis and monitor the books to see that they are financially feasible, that they are keeping their rates right, that the system is run right and so forth. As far as how they operate from a Board of Directors, no, we don't have any authority over that.

Mrs. GILLIBRAND. Ms. Marlette.

Ms. MARLETTE. I am not sure if the Commission actually regulates the ones you were talking about. There are 15 that are subject to Commission regulation, two of which are in Georgia. I don't know if those are the ones you are talking about, but I would make clear that to the extent the Commission regulates co-ops, one, we don't regulate if they sell less than 4 million megawatt hours per year. But also even for the ones we do regulate, we would not regulate the retail, the sales to the retail customers, those rates.

Mrs. GILLIBRAND. So are you both satisfied that you have the resources you need and the ability you need to regulate co-ops, the ones that you do have authority over, to make sure that these kinds of examples are not taking place in the ones that you do regulate?

Mr. ANDREW. I do. I can testify to that, yes.

Ms. MARLETTE. And again for the ones that the Commission regulates, the Commission does have sufficient authority again only going to the wholesale side of the transactions.

Mrs. GILLIBRAND. In my remaining time, can you just describe what your actual oversight process is? How often do you look at the co-ops? Do you review their books yearly? What is your actual process?

Mr. ANDREW. First of all, they have to send in statements monthly. Then they have to send annual reports to us with financial reports. We have our, what we call the field representative that goes in there very actively at least—I won't say how often because some of them are scattered kind of thin. But they go by and check the technology and the applications and so forth. Then we have field accountants that do audits on the books on a regular basis. Sometimes it depends on what kind of condition they are in as to how often it has to be done.

I will say this. Over the years, they have become a little more sophisticated. They have better accounting. They have computers.

They have all the things in their organization that we are able to monitor more closely than we ever have in the past even though we have fewer people in the field. Because of what we are able to do now, I feel very comfortable with the way we are monitoring, ma'am.

Now—this is an aside. Having served on the Board of Directors of an electric co-op, I can tell you when you go to a co-op meeting, it is very serious when we talk about the financial arrangements and how they operate their organization. We know that we have to respond to the membership, and the Board Members are elected by the membership. Therefore it has a responsibility to be—and, yes, we feel financially liable as well.

Mrs. GILLIBRAND. Ms. Marlette?

Ms. MARLETTE. Depending on the type of entity it is, the Commission has two ways of regulating. One, some utilities are served under cost-based regulation; others have market-based rates. And depending on what type of regulatory authority they have, the Commission may be more detailed in how it regulates, and the Commission always has access to the books and records of companies.

Mrs. GILLIBRAND. Do you look at the books and records of companies?

Ms. MARLETTE. Yes, but more so for the ones that are under cost-based regulation. Almost all transmission rates are cost-based regulated. For the generation side, we probably have more that are market-based regulated.

Mrs. GILLIBRAND. How often would you review the books and records?

Ms. MARLETTE. It is going to depend. I mean the Commission has an audit program. And again if they are under cost-based rates, we periodically audit. So I couldn't give you a specific number. It would depend on what the Commission is looking for and the type of issue.

Mrs. GILLIBRAND. And do you feel you have sufficient resources? And do you feel that you think the regulatory basis that you have to use is sufficient?

Ms. MARLETTE. Yes.

Mrs. GILLIBRAND. Thank you.

The CHAIRMAN. The chair thanks the gentlewoman. The gentlewoman from Kansas.

Mrs. BOYDA. Thank you, Mr. Chairman, and thanks to the witnesses for being here. I am also from Kansas and just wanted to kind of follow up on what you were seeing in the rest of the country, your perspective. When the Sunflower plant was discussed, most people in Kansas, not everybody, but most people in Kansas, understood that coal was going to be part of our future in some way or another.

We came in with some coal sequestration and a closed-loop system that was really quite exciting. And are you financing; are you involved in any programs? Is there one up in North Dakota that we are talking about carbon sequestration? What is happening in your world with those new technologies?

Mr. ANDREW. Of course, we are not able to finance any baseload generation which basically would eliminate any coal.

Mrs. BOYDA. Can you help me explain that? I am not sure I heard the entire—you are not able to fund any baseload?

Mr. ANDREW. Well, we are able to, but we are temporarily suspended, I would guess would be a better way to say, until we arrive at a conclusion about fees to cover the subsidy rate.

Mrs. BOYDA. Yes, this is why we stay right here.

Mr. ANDREW. We need to have have this in place so we can make loans on baseload generators. Now, understand that baseload means 24 hours a day, 365 days a year. We have intermediate generation which takes up some of the slack there. As far as the one in North Dakota, that is Basin Electric in North Dakota. And we have been working with them for a long, long time, and they are very innovative. And they have an idea——

Mrs. BOYDA. A long time is?

Mr. ANDREW. Pardon?

Mrs. BOYDA. How long is a long time?

Mr. ANDREW. Probably 40, 50 years.

Mrs. BOYDA. Oh, my. Not on sequestration?

Mr. ANDREW. Not on sequestration.

Mrs. BOYDA. Okay, you had me worried there for a minute. Okay.

Mr. ANDREW. They use a lot of coal in their generation. Therefore, they have been working with sequestration, figuring out the best way to do these things.

Mrs. BOYDA. Right, and this is an existing plant that we are talking about?

Mr. ANDREW. Yes. Well, two plants. They have one plant that is making gas, natural gas out of coal, and they have some byproducts from that that are selling. But the CO_2 that is generated at that plant is put into a pipeline, transmitted 250 miles to Canada, pumped into oil wells which brings oil out of the ground.

So, we are going to take one of their coal-fired generating plants that is nearby. They have a technology that has been tested in Ohio. They are going to expand it up to a big project now and put it at the back end, where the coal-fired generating plant will take the emissions out of that plant, transport it over to this other plant that is now taking the CO_2 and putting it in a pipeline. They will put this CO_2 in the pipeline.

As I understand it, there is some oil in North and South Dakota. So, they might tap on this pipeline and do the same thing, and that is inject this down into the soil and force oil out.

So yes, there is a project we are interested in. The technology looks good. They have researched it quite well.

Mrs. BOYDA. And are you helping to finance some of that then? Is that part of your——

Mr. ANDREW. They are telling us that they want to come in, and we are willing to help finance it. Yes, ma'am.

Mrs. BOYDA. And I am just again curious. Do you know if it has broader application, or is this pretty site specific or——

Mr. ANDREW. Well, we think it has broader application. In fact, generation and transmission cooperatives across the United States think it has broader application. We will see. We think it will.

Mrs. BOYDA. All right, thank you. Do you, Ms. Marlette?

Ms. MARLETTE. Pardon me?

Mrs. BOYDA. Ms. Marlette, do you have anything to add? And just again this is so interesting to get just opinions. And I know you don't have a crystal ball any more than the rest of us do. But with the closed-loop bio-system; the algae in there; do you see any interest in that with existing plants? And I know you are not working with baseload plants. Do you see people coming to talk about that?

Mr. ANDREW. I have been looking at that a little bit lately, and especially about 3 weeks, 4 weeks ago, there was an agency in USDA that brought in some college projects for us to observe. And one had to do with algae, and I am very interested in that. It is not ready to go commercial yet, but the idea seems to be working. Put the CO_2 in the water, the algae consumes it, and you burn the algae as diesel. I think it is going to work, but it is not ready for commercial application.

Mrs. BOYDA. All right, what is so interesting—and then I will yield back my time. But what is so interesting are technologies that really weren't even being discussed 2 and 3 years ago are absolutely moving forward in real ways. So we appreciate what you are doing to help finance some of that. Thank you very much.

The CHAIRMAN. The chair thanks the gentlewoman. The gentleman from Ohio.

Mr. SPACE. I will yield my time, Mr. Chairman. Thank you.

The CHAIRMAN. The gentlewoman from South Dakota.

Ms. HERSETH SANDLIN. I have just one question for this panel. Administrator Andrew, your written testimony—and I apologize if this has been addressed before I was able to arrive at the Subcommittee meeting. But your written testimony notes that the October 2007 report by the North American Electric Reliability Corporation finding that in 2010, the capacity margins in the region that include South Dakota will fall below target margin levels needed to meet summer peak and avoid brownouts or blackouts.

How do you think the region should address this challenge, and how are USDA programs helping them meet the challenge?

Mr. ANDREW. That margin is 15 percent, as I recall. I think that is correct, and what that means is it is like if you have total capacity—like at your home. If everything in your home is turned on and you reach capacity of your circuit breaker panel that is in there, you need a margin above it just in case something goes wrong. Well, their report says that in South Dakota that they are going to reach a point where that margin is going to start decreasing. And we think it is going to decrease all across the United States down to as low as 10 percent within 2 years. And it is critical that that margin be there just in case we have a big outage if one plant goes down or whatever. And if it does, then that margin will not be there to take up the slack.

Ms. HERSETH SANDLIN. So if the margins are going to go down, what policy should we be implementing? Is it increasing the capacity, a new transmission grid upgrade? I mean what——

Mr. ANDREW. All of the above. You are going to need some more transmission. You are going to need more generation. Generation is going to be the key to all this stuff along with transmission now. Like I have said several times, you can build all the wind farms

you want to in North Dakota and South Dakota, but if you can't get it to Chicago, you have not done a good job.

And right now, frankly, the low-hanging fruit is what we are gathering. We know where the wind is. And we are building the wind farms where there is transmission available. But when we run out of that and we still have places where the wind blows and we want to build these wind farms and other farms actually, transmission is going to be required to get it out of there.

Ms. HERSETH SANDLIN. And then with generation, so USDA programs are helping meet the challenge on the generation front as well? As you know, in South Dakota, we have a project that is looking to expand in the far northeastern corner of the state that is hitting some challenges as it relates to regulatory approval in the neighboring State of Minnesota.

We have a new possible plant going in through base and electric in north central South Dakota. Can you elaborate for the Subcommittee on how USDA programs are facilitating these efforts on the generation front?

Mr. ANDREW. Well, as we said earlier, we are not able to—right now, baseload generation has been suspended, and that is some of what you are going to have in South Dakota. We can still make loans for intermediate power and peaking power, but baseload generation right now is on the back-burner.

Ms. HERSETH SANDLIN. Okay, thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Andrew, the farm bill directed a study for electricity generation in rural America. What is the status of the study?

Mr. ANDREW. I am sorry. Say that again, sir.

The CHAIRMAN. In the farm bill, we directed a study for electric generation in rural America.

Mr. ANDREW. It has been completed, and it is going through clearance right this minute.

The CHAIRMAN. And how many days did we give you to present that to us? I forget. It was——

Mr. ANDREW. Any minute.

The CHAIRMAN. So we will be receiving that any minute?

Mr. ANDREW. Yes.

The CHAIRMAN. Thank you, Mr. Andrew. Ms. Marlette, what is the annual percentage of growth and usage of electric power?

Ms. MARLETTE. Well, I don't have an answer for you on that right now. I could try to get one for you. I don't know. I can say that just as a general matter, as was alluded to earlier, reserve margins are going down. Generally, the country as a whole needs to focus very much on increased capacity to meet growing demands. Demand response is another issue, but the other piece of this I would point out is that transmission infrastructure is key to all of the future.

The CHAIRMAN. Thank you. Any Members have any additional questions for the panel?

Mrs. BOYDA. Yes, I would like to, Mr. Chairman.

The CHAIRMAN. The gentlewoman from Kansas.

Mrs. BOYDA. And again I apologize. I think you addressed this earlier, but could you help me understand why baseload is on hold

again? Can you explain that to me? I didn't catch it the first time if you did.

Mr. ANDREW. We have not been able to arrive at a conclusion about how to deal with subsidy rates. We can, then establish a subsidy rate that the appropriators will provide for us, or we can be allowed to charge a fee, which we would like to do, so we don't have to have appropriations. Then we could make baseload generation loans.

Mrs. BOYDA. Is it Congress that is holding that up by any chance?

Mr. ANDREW. I am sorry?

Mrs. BOYDA. Who is holding that up? Is that——

Mr. ANDREW. Well, no one is really holding it up. It was established by OMB that we needed a 1.92 subsidy rate, and we had it in the farm bill that we could charge a fee up-front to cover that cost. And it was taken out of the farm bill. I think it was taken out of the farm bill at the last minute.

Mrs. BOYDA. All right. Thank you.

The CHAIRMAN. The chair recognizes the Ranking Member.

Mr. LUCAS. Mr. Chairman, we have talked about the subsidy rate. If I could just touch on that for a moment. That is a very important issue. When OMB required that, in effect it stopped the program unless this number could be matched. The effort in the farm bill was to, in effect, give RUS the authority to charge almost two percent for a co-op wanting to come in and generate at the generating capacity.

The language was removed at the highest level when we were in the farm bill conference. The highest level is not the minority side. It is not this Committee. It was removed at the highest level. It would appear, speculation, that it was removed because someone didn't want baseload generation to be created from coal or from nuclear.

So in a polite response to the lady's question, that is where it went. Ask the Speaker.

The CHAIRMAN. The chair recognizes the gentlewoman from South Dakota.

Ms. HERSETH SANDLIN. Thank you, Mr. Chairman. One last question, Mr. Andrew. In your testimony, you mentioned that cooperatives are energy efficiency and demand side management leaders. I agree, and I am just wondering from your perspective how can Congress best support such efforts to help low-income homeowners in rural states like South Dakota install energy efficiency measures; which, by all accounts, are additional low-hanging fruit to achieve the substantial percentage of conservation on efficiency measures in the country?

Mr. ANDREW. We have this year $6 million to be used for high energy cost grants, and that is what they are, grants. It is the only grant program we have. It is a very competitive thing, and we could have used more. But some of the projects that we have seen have been very innovative and very effective.

So to say where it could be—that number is down right now, but the place that we can use—where the money is being used is in Alaska, Alabama, and other places. I think South Dakota got a cou-

ple this year. So the high energy grant is an important factor about this.

Now, to take that one step further, in our announcements, we are saying we are talking about efficiencies because efficiency is not only our job, but it is the job of the electric co-op to sell it to the members of the co-op. For example, they have been handing out these compact fluorescent light bulbs by the thousands. We have been talking about what we call phantom power. If you walk in your house and you see all the little lights turned out, this counts for about 20 to 25 percent of your electric bill. You don't realize if you turn it off at night, turn your television off, your cell phone charger is using electricity even when the cell phone is not hooked up. Those kind of things are what we are talking about to the co-ops, and they are adhering to it.

I think I read that somewhere we have about 90 percent of our co-ops are participating in some sort of renewable projects or in some kind of efficiency projects and conservation projects.

Ms. HERSETH SANDLIN. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. The gentlewoman from Kansas wants to ask another question if the panel would just wait a moment please.

Mr. LUCAS. Mr. Chairman, while she is doing that if, on the next panel, some of the comments that were made about the integrity of the co-ops in this country, I would hope that we will hear a response and clarification at the appropriate time.

The CHAIRMAN. I am sure we will. I see the Ranking Member; are there no further questions? Well, the chair thanks the panel for its testimony and welcomes the second panel. We would like to call them to the table. The Honorable Glenn English, CEO, National Rural Electric Cooperative Association. Mr. Revis W. James, Director of Energy Technology Assessment Center, Electric Power Research Institute. The Honorable Jim Nichols, former Minnesota Secretary of Agriculture and former Minnesota State Senator from Lake Benton, Minnesota. Mr. Paul Champagne, President, PPL Development Company, Allentown, Pennsylvania.

Mr. English, welcome to a room you are very familiar with. I remember when you were sitting a few seats down from me, and I was all the way down there. I could barely see you. So when you are prepared, Mr. English.

STATEMENT OF HON. GLENN ENGLISH, CEO, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, ARLINGTON, VA

Mr. ENGLISH. Well, thank you very much, Mr. Chairman. It is a delight to be back in this Committee room, and I have a lot of fond memories. Not as many folks here that I served with that was just a few years ago, but certainly it is a pleasure to be here and certainly a pleasure to discuss with you what is a very critical issue not only for agriculture but for the country at large.

The challenge that we are facing is not that different than the rest of the industry is facing, but only from a standpoint that electric cooperatives are growing twice as fast as the big power companies are. So with all this growth, obviously that is having an impact as far as the amount of power that is necessary.

I think, Mr. Chairman, the Committee is probably well aware of the fact that electric cooperatives are not for profit. They are owned by their members, and they have local governments. And they are private. They are always very pleased to point out to me that they are independent and autonomous, and they act so. They certainly have a lot of different varieties in the way that they carry out their business and meet the needs of their community.

The big issue I want to bring to your attention is one of the facts that we are running out of capacity. We simply don't have the generation capacity, and in the country certainly electric cooperatives do not to meet what the Department of Energy tells us is going to be a great demand.

In fact, the Department of Energy is talking about over the next 20 years we are going to need somewhere in the neighborhood of 264 gigawatts of power, which is about 2½ times the amount of power that the State of Texas produces today or about four times what the State of California produces. And that is assuming that we implement all the efficiency provisions that we think can be the case, particularly as far as the electric utility industry is concerned.

We think the next 10 years is going to be the most difficult simply because coal is not likely to be a part of the mix. We expect that there will be climate change legislation in the next year or 2 that will take coal out of the picture until we are able to get some kind of carbon capture and storage in place.

I will let EPRI talk about what their expectations are as to when that will likely come about, but it is my understanding it will be somewhere in the neighborhood of 2020, 2025, somewhere in that neighborhood.

And we are really looking at 118 gigawatts of power that this country is going to have to have before 2020 and have to be done without the use of what has been our primary fuel, namely coal. And, of course, that is going to make our job very difficult. Our role is to try to keep our electric rates as low as we can, those electric bills as low as we possibly can while trying to keep the lights on and meeting the needs of our members in rural America.

That means we have to use other elements, and we are going to have to be innovative. And we are going to have to be committed, and this is going to have to be a partnership between the Federal Government and the electric utility industry, and certainly a partnership between this Committee and the electric cooperatives.

Efficiency is going to have to play a major role. That is the so-called low-hanging fruit that we can probably harvest earliest, and we are already doing that. The Administrator talked about compact fluorescent light bulbs and co-ops across the country handing those things out by the millions. And we are looking for other ways in which we can address it.

But, the point that we are going to have to deal with is low-income folks. Those are the people that are going to get hurt the worst. They are the people that are least in a position to be able to deal with this kind of a challenge, namely because they have the most inefficient homes, least insulation, most inefficient windows and doors, most inefficient appliances. And the Congress is going to need to address that.

Renewables, which I know is a favorite of this Committee, can play a major role as well. How big a role is going to be determined by the amount of transmission we are able to build. Wind is going to be the primary fuel for generating renewable energy.

It is the most advanced, and certainly we are looking at the Great Plains. We have established a national renewable electric cooperative, which allows cooperatives all across the nation to invest in the most cost-effective renewable projects that we can find, which we believe will be in the Great Plains. But we can generate far more power out there than we have people to use that power. So we need that.

We need technology to speed up carbon capture and storage, and we need an even greater investment than the Congress has made in that area. And certainly nuclear power has to play a very major role as well where it can be utilized. And it may call for some very drastic measures on the part of the Federal Government.

We have even advanced the idea that the only way that we can get the amount of power we are going to need over the next decade may be for the Federal Government itself, using the model of the PMAs, to go out and build nuclear power plants so we can reprocess the fuel. So we don't have to worry about that nuclear waste that so many folks in Nevada are worried about, Mr. Chairman. And to be able to site those plants where they need to be sited and also take care of the security needs that are going to accompany any kind of nuclear power plant.

We are going to have to have some different kind of thinking to meet this challenge, Mr. Chairman. And it is always a pleasure to be here. Thank you very much for letting me run over about 34 seconds.

[The prepared statement of Mr. English follows:]

PREPARED STATEMENT OF HON. GLENN ENGLISH, CEO, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, ARLINGTON, VA

Executive Summary

The nation is facing an unparalleled energy crisis and lacks a national policy to handle the problems of electricity capacity, reliability and rising prices. While it is important to find solutions to global climate change, it is equally critical to establish policies that will ensure there is enough electricity to assure consumers have a secure and affordable energy future.

By 2030, according to the U.S. Department of Energy (DOE), even with relatively aggressive efficiency gains, the nation will still need 264 new gigawatts of installed electricity capacity. To better understand the magnitude of this need, consider that 264 gigawatts is roughly 2.5 times the power now generated in the State of Texas. Efficiency and conservation are necessary and must be pursued wherever such projects are economic, but efficiency and conservation alone cannot meet the new capacity needs.

Working with the Rural Utilities Service (RUS), the nation's electric cooperatives have, over the past 75 years, built incredibly reliable and efficient systems for distributing electric power to 75 percent of the nation's land mass. Although the smallest segment of the electric utility industry, electric cooperatives are experiencing the highest growth percentages. Because of our historic service footprint, cooperatives also serve some of the nation's poorest consumers. We are deeply concerned about the impact of rising electricity prices and additional charges for new environmental programs on these consumers.

The obligation to serve our 41 million consumers drives us to tackle these problems head on. Across our 47 state service territory, which encompasses 75 percent of the nation's land mass, cooperatives are actively engaged in discussions with our consumers and our elected officials, seeking balanced solutions that will protect the

environment and assure consumers have a basic human right—affordable electric power.

Areas of discussion, study and policy advocacy where cooperatives are engaged include:

- Renewable energy, including formation of a "National Renewable Cooperative Organization."
- Energy efficiency, with a focus on helping low-income consumers.
- Nuclear power, ensuring that cooperatives can access the latest technologies and partner with other utilities.
- Climate change solutions.
- Clean coal technologies such as Carbon Capture and Storage.
- Support for new transmission projects.
- The Rural Utilities Service's role in helping electric cooperatives meet these new challenges.

Chairman Holden, Ranking Member Lucas and Members of the Subcommittee:

My name is Glenn English, and I am the Chief Executive Officer of the National Rural Electric Cooperative Association (NRECA). I appreciate the invitation to appear before you today to discuss what our nation and electric cooperatives can do to help ensure a secure and affordable energy future. I had the distinct honor of Chairing this Subcommittee during the latter part of my service in Congress. In a way, I feel like I'm back home with you this morning.

Overview of Electric Cooperatives

NRECA is a trade association consisting of nearly 1,000 cooperatives providing electricity to 41 million consumers in 47 states. As member-owned, not-for-profit organizations, cooperatives have an obligation to provide a reliable supply of electricity to all consumers in our service areas at the lowest possible price. We take our obligation to serve very seriously—the personal and economic health of our members, our communities, and our nation depends on it. Cooperatives serve primarily the more sparsely populated parts of our nation but cover roughly 75 percent of the nation's land mass.

Electric cooperatives are:

- Private independent electric utility businesses,
- Owned by the consumers they serve,
- Incorporated under the laws of the states in which they operate,
- Established to provide at-cost electric service, and
- Governed by a Board of Directors elected from the membership.

Electric cooperatives were born in the 1930s, when few rural Americans could access electricity at all. President Franklin Delano Roosevelt, champion of the Rural Electrification Administration (now the Rural Utilities Service or RUS), observed that "electricity is no longer a luxury, it is a definite necessity." Seventy-five years later, RUS loan programs are still an essential ingredient in bringing affordable, reliable electricity to all parts of America. Investor-owned and municipal utilities have access to substantial Federal support for infrastructure development through the tax code. Electric cooperatives, as private not-for-profits, do not have this access to this level of support and instead rely on lower-cost loans that must be paid back.

Today, electric cooperatives continue their work, based in the strong belief that affordable, reliable electric power is a fundamental right for all Americans. However, this right has never been more in question than it is today.

The U.S. Faces a Daunting Energy Crisis: Reliability, Capacity and Prices

A serious energy challenge faces this nation. Frankly, I believe that many in Congress are focused on only one half of the looming challenge—global climate change. But the other half is just as critical, though it has not received the same spotlight, and that is the fundamental question of whether the nation will have enough electricity capacity to meet consumer energy needs.

Some background facts are essential. EIA has projected, taking reasonably expected efficiency improvements into account, that electricity demand will grow 30 percent by 2030, requiring 264 new gigawatts of electric generating capacity. To better understand the magnitude of this need, consider that 264 gigawatts is 2.5 times the capacity now in the State of Texas. The more critical and immediate problem will come in the next ten years. The Department of Energy, again taking reasonably expected efficiency improvements into account, forecasts that U.S. economic and

population growth will drive a 17 percent increase in demand between 2006 and 2020, requiring a capacity increase of 118,000 MW.

Among electric cooperative consumers, demand growth is projected at about double the national average. Additionally, cooperatives serve some of the nation's poorest consumers, including several Native American reservations. Electric cooperatives take seriously our responsibility to meet our consumers' electricity needs, while also taking a leadership role in the development of renewable energy, energy efficiency and the portfolio of new technologies and approaches needed to solve our nation's energy challenges.

Section 6103 of the Senate farm bill would have allowed cooperatives to continue, as they have for 75 years, accessing RUS financing to construct baseload generation. Unfortunately, this provision was dropped in the farm bill conference. However, NRECA thanks the many Members of the Agriculture Committee who supported the provisions. Without RUS financing for baseload generation, co-ops will have to buy increasing amounts of power on the open market because they cannot generate enough power to meet their consumers' needs. With this significant policy shift, only electric cooperatives, among the three utility sectors, have been denied their primary source of Federal support for generation. Preventing cooperatives from accessing the RUS program places an additional heavy burden on their efforts to build generation that will reduce carbon emissions.

Without significant changes in our national energy policy to meet capacity demands, in the next decade, U.S. consumers will be significantly exposed to rising and volatile electricity prices beyond anything experienced to date. In the absence of a true national energy policy, some advocacy groups are proposing piecemeal solutions, recommending over-reliance on their preferred technology or fuel. The reality—there is no one silver bullet and all the technologies at our disposal must be used to both meet our capacity needs and achieve new environmental goals.

The reliability problems posed by a lack of adequate capacity will begin to manifest as early as 2009, according to the North American Electric Reliability Corporation (NERC), the self-regulatory organization responsible for monitoring and strengthening the bulk power system's reliability. In some regions, demand will soon outstrip capacity unless generation and transmission are added. Rapidly thinning capacity means that technicians and operations personnel, whose daily behind-the-scenes efforts keep the electric grid intact, are already seeing reliability "near-misses" when key lines or power plants go down. These events haven't resulted in widespread blackouts and so far, haven't received attention in the press or from policymakers. But, if we fail to address our growing energy infrastructure and technology development needs, some regions face increasing probabilities of brownouts and blackouts in the near future. (See attached NERC map of U.S. regions facing near-term reliability threats.)

The Electric Power Research Institute (EPRI) has researched and written extensively on the need to have a full portfolio of solutions in order to ensure adequate capacity and achieve carbon reduction goals. EPRI conducts research and development on technology, operations and the environment for the global electric power sector. EPRI, a nonprofit organization, brings together its members, the Institute's scientists and engineers, along with experts from academia, industry and other research centers to meet challenges in electricity generation, delivery and use. EPRI supports multi-discipline research in emerging technologies, which drives long-range research and development planning. EPRI's members represent more than 90 percent of the electricity generated in the United States. (See attached EPRI "prism.")

This spring, NRECA brought over 3,000 co-op advocates to Washington, D.C. to talk with their Federal representatives about the nation's energy challenges and the types of bold ideas needed to solve these problems and provide Americans with a secure and affordable energy future. Congress will need to make significant policy decisions soon to address the coming electricity crisis and provide options for shifting the nation's generation fuels while minimizing costs. It is important that these issues be reconciled before a formal national policy to tax and regulate carbon is set in place. Working together, government and industry can make the investments and plans that are critical to ensuring that any carbon reduction policy is sustainable over the decades.

Many Pieces of an Energy Policy Solution: All Require Concerted, Long-Term Efforts

Energy Efficiency

NRECA supports efficiency and conservation as a least-cost means of reducing some of the need for increased capacity over the next decade. But consumers and policymakers are receiving a great deal of information about efficiency and it is very difficult to determine precisely how much energy savings efficiency technologies and

measures can yield. Some advocacy groups believe that increased energy efficiency can absorb up to 80 percent of the projected growth in electricity demand. Others see potential for a 20 percent savings in total electricity demand.

EIA has projected a need for 347,000 new megawatts of electricity capacity by 2030. EIA believes that allowing for the efficiency improvements we can reasonably expect, the new capacity demands will still equal, as I stated earlier, 264,000 megawatts by 2030. The 2005 California residential and commercial building code is said to have the potential to save 180 megawatts in annual energy demand. Judging from the cited capacity needs projection (without efficiency measures) of 347,000 new megawatts, the nation would have to identify and develop and then consistently fund, operate and verify nearly 2,000 projects on the scale of California's to meet 100 percent of the new 2030 needs with efficiency and conservation. Utilities with an obligation to provide electric power would still be required to own generation sufficient to meet consumers' needs in case efficiency programs could not be consistently maintained.

Electric cooperatives are engaged in many efforts to increase efficiency, conservation and demand response. For instance, NRECA is a member of the Energy Efficiency Codes Coalition (EECC), which is actively working to strengthen model building codes. Existing buildings are responsible for over 40 percent of the world's total primary energy consumption and account for 24 percent of the world's CO_2 emissions. Energy efficiency is often the most cost-effective way to increase energy security, reduce energy costs, and cut emissions. While Congress took some steps toward improving standards for appliances and manufactured housing in the Energy Independence and Security Act of 2007, even more gains are needed.

NRECA is also working to ensure that efficiency and conservation programs reach the people who can least afford to pay for efficiency improvements but whose homes are often most in need of new appliances, insulation and other measures. Personal income tax credit incentives can't help large segments of the population whose income is too low to pay significant taxes.

Studies of successful low-income efficiency programs show that investments of about $2500 per household to replace or upgrade components such as windows, refrigerators, lighting and HVAC systems, can lower energy bills as much as 32 percent. Therefore, the nation should get started and provide the poorest fifth of American households even $500 dollars of direct assistance with energy efficiency—at a cost of over $12 billion a year. Such a program would give *immediate* help to reduce growth in national power demand and keep their electric bills affordable.

Nuclear Power

Nuclear power can provide significant amounts of the clean capacity we need by 2020 and 2030. EPRI estimates four new plants will need to come online each year from 2015 to 2020 for nuclear power to make its contribution to meeting electricity needs and reducing carbon emissions to 1990 levels by 2030. This projection will not be met. The new fleet of baseload nuclear plants is progressing slowly, with virtually none expected to come online before 2020. These new plants also face opposition and substantial financial risks. In some cases, cost estimates for proposed plants match or exceed the entire value of the utilities proposing to build them. A 30 year U.S. hiatus from the business has resulted in suppliers, industry expertise and workforce being largely located overseas.

Still, these plants are needed as soon as possible to achieve reliable and affordable power and reduced greenhouse gas emissions. In order to move past the many bottlenecks, policymakers must recognize: (a) the need for innovative funding which minimizes risks; and (b) that safe, on-site waste storage and reprocessing are possible for the next century until long-term storage is available. A comprehensive energy policy should also recognize the contributions cooperatives can make to nuclear projects and allow RUS to continue making baseload loans for generation, including nuclear generation. Electric cooperatives should also be able to lower their construction costs by accessing the nuclear tax incentives provided in the Energy Policy Act of 2005 and other bills.

Cooperatives see these delays in increasing our nuclear capacity as a situation so urgent that Federal involvement is necessary in the form of incentives and new partnerships. For instance, the Defense Department has the capability to manage the construction of large projects and to protect sensitive sites. It also has priority access to materials, decommissioning expertise and many other skills which make the Defense Department a suitable partner. When the nation faced other serious electricity roadblocks, there was no hesitation to build these kinds of partnerships. We are at such a point in the nation's history again.

Renewable Energy

The small amount of renewable generation in the current electricity fuel portfolio is welcome and needed. Including hydropower, renewable generation is eight percent of the overall portfolio. Non-hydro renewable generation (primarily biomass and wind, with smaller contributions from solar and geothermal) is only 2.5 percent of the overall portfolio, up from 2.2 percent in 1995. The growth percentages in non-hydro renewables are positive developments, but create misperceptions. Polls show that many mistakenly believe that renewable energy alone can satisfy increased demand for power and that non-hydro renewable energy is now a large percentage of the nation's electricity generation. Even wind generation, the primary source of recent renewable energy additions, is a tiny fraction of overall U.S. generation—0.6 percent in 2006 and an estimated 0.8 percent in 2007.

Like all electricity power sources, renewable energy generation growth faces large hurdles in the next decade. Without large Federal subsidies, investment virtually stops. Construction costs, especially for wind, are rising rapidly and there are bottlenecks for equipment delivery—current wait times exceeding 2 years. Since wind and solar are intermittent resources, current projects are only commercially viable where conventional resources, usually gas, are sufficient to back them up. Finally, public opposition to siting projects, such as offshore wind farms and farms on public land, has stopped many renewable developments.

Transmission capacity is inadequate to deliver renewable power from remote areas where renewable resources are located to the population centers where power is needed. Cooperatives are strong advocates for a strengthened and expanded transmission grid. For example, NRECA supports the Federal Energy Regulatory Commission's new rules for siting transmission lines in national interest corridors. In addition, NRECA believes the Federal Government must be willing to develop policies and funding mechanisms for transmission lines that could exceed $2.5 million per mile.

Electric cooperatives across the country recently formed the National Renewable Cooperative Organization (NRCO) to accelerate the development and deployment of renewable energy resources. Formed in March 2008, NRCO's membership already represents approximately 500 distribution cooperatives, collectively serving 23 million Americans in 36 states. NRCO reflects the commitment of cooperatives around the country to the responsible development of cost-effective renewable resources in a manner that benefits their consumers, their communities, and the nation as a whole. NRCO will allow cooperatives to pool expertise in developing renewable energy, share access to sites that are conducive to renewable production, and potentially lower the high capital costs of these projects. National energy policy must recognize that renewable energy is more cost-effective and available in some regions than in others. For example, NRCO will permit southeastern cooperatives to invest in solar and wind where these resources are cheaper and more plentiful.

Co-op planned and owned renewable energy projects are already underway in many of your states. The 2005 Energy Policy Act established, for the first time, a financing tool for renewable energy that gave cooperatives a level playing field with investor-owned renewable energy developers. The Clean Renewable Energy Bond (CREB) allows not-for-profit cooperatives access to low-cost financing, much as the production tax credit provides low-cost financing for profit-making entities. So far, 40 electric cooperatives have developed or are developing $430 million worth of renewable energy projects using this program. I thank the many Members of the Agriculture Committee who have supported legislation to continue and expand the CREB program.

As historic customers and champions of the Federal hydropower program, cooperatives are actively speaking out on the need to upgrade the dams and other key infrastructure under the jurisdiction of the Bureau of Reclamation and Corps of Engineers. A study conducted jointly by the Departments of Interior, Defense and Energy concluded that 2,500 MW of new generation could be produced through rehabilitating and upgrading Federal facilities.

Research, Development and Deployment of New Clean Energy Technologies

Technology is the key to retaining our nation's diverse menu of electric generation fuel options and for lowering the costs of carbon reduction. The sooner an array of clean energy and efficiency technologies are commercial, the sooner we will pass through this dangerous period. Congress can speed the arrival of that day by substantially increasing funding to $2 billion per year for the next decade for carbon capture and storage (CCS) technology and all other options for low- or no-carbon technology solutions.

EPRI has assessed the economic impact of reducing carbon emissions to 1990 levels by 2030, assuming the availability of different fuel portfolios. EPRI emphasizes

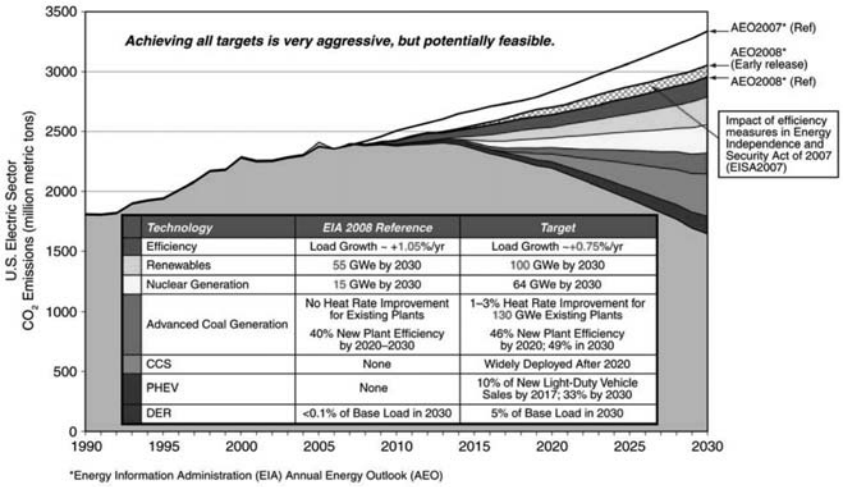
that new advanced clean coal plants are a critical part of a resource mix needed to provide adequate electricity and achieve aggressive carbon reductions. Based upon the EPRI analysis, if the U.S. adopts carbon reduction goals and builds new nuclear power plants as well as new highly efficient coal plants equipped with CCS technology, utility rate increases attributable to a climate strategy would average about 10 percent in real dollars. Electric rates would increase drastically by 2050, however, if the U.S. relies solely on natural gas, renewables and energy efficiency to meet capacity needs, and fails to invest in new nuclear and clean coal technologies.

Some advocates mistakenly assert that CCS is already commercial and ready to be deployed on a wide scale. To ensure that coal will remain part of the nation's electricity fuel mix, a significant technology "push" is needed to make applications like CCS commercially feasible. Scientific experts agree that CCS will not be available until 2020 at the earliest—even with significant investments in research and development. Extensive testing is needed for all phases—capture, transportation and long-term storage. The Federal Government, along with industry, must wrestle with complex issues of carbon ownership and liability.

Recently, cooperatives worked with Congress to introduce the Carbon Reduction Technology Bridge Act of 2008 (S. 3208), which seeks to establish much-needed tax incentives for an array of CCS and efficiency technologies for clean coal. I anticipate this bill will also soon be introduced in the House and I ask for your support. Cooperatives brought this legislation to Congress in a good-faith showing of our willingness to partner with the Federal Government to solve our nation's energy crisis. We are proud, that as the smallest segment of the electric utility industry, we brought this forward and are actively gathering support for it.

Conclusion

Seventy-five years ago, the Federal Government, helped greatly by your predecessors on the Agriculture Committee, created the Rural Electrification Administration so that all Americans could one day have safe, reliable and affordable electric power. Today, virtually all U.S. citizens enjoy this basic right, but it may slip away from future generations unless we all act now to reconcile energy needs and climate goals. Electric cooperatives are committed to developing wise and balanced energy and climate plans now and in the future. We will do this by continuing to work with Congress, RUS and thousands of locally elected cooperative leaders. Thank you for the opportunity to talk with you today. I look forward to answering your questions.



Technology	EIA 2008 Reference	Target
Efficiency	Load Growth ~ +1.05%/yr	Load Growth ~+0.75%/yr
Renewables	55 GWe by 2030	100 GWe by 2030
Nuclear Generation	15 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Heat Rate Improvement for Existing Plants 40% New Plant Efficiency by 2020–2030	1–3% Heat Rate Improvement for 130 GWe Existing Plants 46% New Plant Efficiency by 2020; 49% in 2030
CCS	None	Widely Deployed After 2020
PHEV	None	10% of New Light-Duty Vehicle Sales by 2017; 33% by 2030
DER	<0.1% of Base Load in 2030	5% of Base Load in 2030

*Energy Information Administration (EIA) Annual Energy Outlook (AEO)

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EPRI ELECTRIC POWER RESEARCH INSTITUTE

Year When Resources Drop Below Target Capacity Margins (Committed Resources Only)

The map above identifies the years when a region/subregion drops below target capacity margin levels required to meet peak demand using committed resources. Those region/subregions not identified are not projected to drop below their target margin levels in the next decade.

A "committed resource" is existing, under construction, or planned generation capacity the utility owns or has a firm contract for and for which a firm transmission capability has also been committed to meet peak demand.

National Rural Electric Cooperative Association

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The CHAIRMAN. Thank you, Mr. English. Mr. Champagne.

STATEMENT OF PAUL T. CHAMPAGNE, PRESIDENT, PPL DEVELOPMENT COMPANY, ALLENTOWN, PA

Mr. CHAMPAGNE. Thank you. Good morning, Mr. Chairman, Members of the Subcommittee. My name is Paul Champagne. I am President of the development subsidiary of PPL Corporation. I appreciate the opportunity to provide a broader view of the energy business and energy markets from PPL's perspective.

PPL is a Fortune 500 company located in Allentown, Pennsylvania. It ranks among the largest utility companies in the country. It engage in the generation, marketing and trading, transmission and distribution of electricity. Our competitive generation portfolio consists of nuclear, coal, hydro, natural gas, and we also own an expanding renewable generation portfolio.

PPL's generation is located in the Commonwealth of Pennsylvania, and the States of Maine, New York, Connecticut, Illinois, New Jersey, and Montana. One of our partners includes Allegheny Electric Cooperative, which owns 10 percent of PPL's nuclear generating facility located in Berwick, Pennsylvania.

In the U.S. electric markets, electric grids connect major regions of the country and they themselves are interconnected, making it possible, where economically feasible, to move power back and forth across long distances creating reliability and service and economies of scale.

In 13 eastern and midwestern states and the District of Columbia, the electric grid is operated by the PJM Interconnection, and independent, nonprofit regional transmission organization, of which PPL is a member. PJM plays a key role in ensuring that existing grid is operated in a reliable, cost-effective manner and that new infrastructure to meet steadily increasing demand for electric is developed.

This infrastructure includes new generation transmission lines to move power from where it is generated to where customers need it. Owners of the transmission lines, including PPL and PJM, earn a FERC-approved regulated rate of return on their asset.

PJM also is responsible for running a robust and competitive energy market that provides an opportunity for generators or sellers of load or buyers to transact. Generators who are no longer regulated like PPL rely on the competitive marketplace to recover their investment and earn a rate of return over time. They also rely on adequate price signals from the market when making decisions on whether to expand or build new facilities.

This is a major commitment involving many risks, which includes the high cost of construction, long lead time to site, permit, and build new generating facilities. Recently PJM has identified a need for additional infrastructure in the region including several new high-voltage transmission lines that are critical to maintaining reliability.

PJM also recognized that generators were not being sufficiently compensated for the electricity they were generating. The result was some generating units were retired, and additional generation needed to meet growing and future demand was not being built. In response, PJM changed the structure of the competitive markets.

These changes appear to be working by helping to provide correct incentives for companies in making decisions to expand or build new generating facilities that are needed.

What does the future look like from our perspective? Energy prices are increasing everywhere, whether the state is regulated or non-regulated. On the supply side, the price of fuels used to generate electricity, primarily uranium, natural coal and gas, have increased dramatically. On the demand side, we see increasing demand in the near term and over the long haul.

What can be done to address these higher energy prices? PPL is taking a number of steps on many fronts. We are working to increase generation, infrastructure in PJM and other regions. We are working to increase electricity transmission infrastructure, and we are working aggressively with customers to help them use energy more efficiently.

Increasing generation capacity is important for our nation's energy security and to be able to meet growing customer demand for electricity. At PPL, we are increasing the output of our existing nuclear facility by about 10 percent. We are expanding renewable and clean hydroelectric generating capacity in Pennsylvania, Montana, and Maine. We are investigating opportunities to build new, efficient, natural gas-fired generating plants. We have supported research in carbon capture and storage technologies through our membership in the Future Generation Alliance.

We are expanding our renewable energy business in wind, solar, biomass, and landfill methane. We plan to invest more than $100 million in new renewable energy projects and another $500 million in hydroelectric projects over the next 5 years. We are also preparing a combined operating license application for a new nuclear unit adjacent to our existing nuclear generation facility, and we plan to submit that to the U.S. Nuclear Regulatory Commission before the end of the year.

At PPL, we are optimistic about the ability of nuclear energy to provide significantly increased generation capacity in the United States, but with the significant cost of nuclear generation, the financial backing of the Federal Government in the form of loan guarantees will be essential if projects are to be moved forward.

We encourage the legislators to build a foundation based on the Energy Policy Act to support and expand a nuclear loan guarantee program. PPL already generates about 40 percent of its electricity from non-carbon emitting resources. And as a major generator, we recognize the need to address climate change in a reasoned way.

Thank you for the opportunity to testify before you this morning. I will be happy to answer any questions.

[The prepared statement of Mr. Champagne follows:]

PREPARED STATEMENT OF PAUL T. CHAMPAGNE, PRESIDENT, PPL DEVELOPMENT COMPANY, ALLENTOWN, PA

Good morning Mr. Chairman and Members of the Subcommittee: My name is Paul Champagne, and I am president of the development subsidiary of PPL Corporation. I appreciate the opportunity to provide a broad overview of the energy business and energy markets from PPL's perspective.

PPL is a Fortune 500 energy holding company headquartered in Allentown, Pa., and ranks among the 10 largest electricity companies in the country. We are engaged in the generation, marketing and trading, and distribution of electricity. All

of the approximately 12,000 megawatts of generation capacity we own are in deregulated, competitive wholesale electricity markets, primarily in the mid-Atlantic region and secondarily in the northwestern United States.

On the regulated transmission and distribution side of our business, we serve more than four million customers through subsidiaries in Pennsylvania and the United Kingdom, and own and operate 52,000 miles of electricity transmission lines in Pennsylvania.

Our competitive generation portfolio consists mainly of nuclear, coal, hydro and natural gas power plants, although we also own and operate a growing portfolio of biogas and solar generation assets. Our energy marketing and trading arm, PPL EnergyPlus, buys and sells energy in key U.S. competitive wholesale and deregulated retail markets, and provides energy solutions to business, industry, government and institutions. We have a long track record of providing reliable electricity in regions where we do business.

In the U.S. electric market, PPL and other companies are able to buy and sell electricity widely because of the infrastructure that is in place: an electricity transmission and delivery system interconnected in a grid. Electric grids connect major regions, and are themselves interconnected, making it possible—when economically feasible—to move power back and forth across long distances, creating greater reliability of service and economies of scale.

Here's a brief example. Say PPL generates a quantity of electricity at its Susquehanna nuclear plant near Berwick, Pa., and wants to sell that electricity to a wholesale buyer in Delaware. With price and other terms set, the plant generates the electricity, and the buyer in Delaware then takes an equal amount off the grid for use.

In 13 eastern and midwestern states and the District of Columbia, the electric grid is operated by the PJM Interconnection, an independent, nonprofit entity whose main roles are to operate the grid reliably, plan for its expansion when necessary, help establish the correct price signals for new generation and transmission where needed, and oversee the electricity markets enabled by the grid.

PJM, as an independent, regional transmission organization, can be seen as a very astute traffic cop who possesses an in-depth understanding of how a complex system of roadways, with many on and off ramps—in this case, the electric grid—works. PJM looks at the demand requirements of customers and communicates with generators and transmission owners regarding the amount of power needed, and where and when that power is needed; and PJM plans for future needs. PJM is the largest and most liquid electricity market in the United States, and it is in this market that most of PPL's generation assets are located.

PJM plays a key role in enabling the new infrastructure needed for energy companies to meet steadily increasing demand for electricity. This infrastructure includes new generating plants and new transmission lines to move the power from where it is generated to where customers need it.

If someone wants to build a generating plant in the PJM region, that plant may require an upgrade to the grid to handle its output and balance the overall system. PJM, working with the transmission owners and local electric delivery companies like PPL Electric Utilities, conducts interconnection studies for new sources of generation, and has a queue process through which generators get a place in line, pay for the costs of interconnection, and become interconnected in an orderly and controlled manner. PJM ensures that the system is not disrupted by additional generation sources and that the costs of interconnection and any required system upgrades are borne by the appropriate parties or customers.

Owners of transmission lines on the grid earn a regulated rate of return on their assets. The return is set by the Federal Energy Regulatory Commission (FERC). Generators, who are no longer regulated in deregulated markets such as Pennsylvania, rely on the competitive market to recover their investment and earn a return over time. And they rely on adequate signals from the market when making a decision whether to build a new plant—a major commitment because of the risks involved, including the high cost of construction and the long lead time required to site, permit and build a new generating facility.

Generators make their money in three ways—by selling energy, by selling capacity (which is the right to have generating units available to operate and provide power, if and when needed) and by selling ancillary services (which include needed voltage support services that are required to balance and operate the grid reliably and avoid disruptions).

Recently, PJM has identified the need for additional infrastructure in the region—both transmission and generation, including several new transmission lines that are critical to maintaining reliability. Those lines are currently undergoing siting and related approvals. PJM conducts Regional Transmission Expansion Planning every

year. Through this process, PJM can call for additional power lines to be built in the grid to handle increased demand for electricity or the need for more electricity capacity to serve markets in the grid.

One example of this is a new 500,000 volt power line called for by PJM to run between Berwick, Pa., and Roseland, N.J., to prevent overloads on other power lines due to increasing demand for electricity. PPL Electric Utilities, in its role as an owner and operator of transmission, has been assigned by PJM to build the Pennsylvania portion of the line and is now in the process of choosing a preferred route and preparing to submit it the Pennsylvania Public Utility Commission for approval.

As you know, the Energy Policy Act of 2005 granted "backstop" siting authority to the FERC for certain transmission lines. To date, FERC has not had to exercise this authority. It would be needed only if the traditional state siting process breaks down, and it is determined that a transmission line in a designated National Interest Electric Transmission Corridor (NIETC) must be built for grid reliability purposes. In the case of the Susquehanna–Roseland transmission line, PPL does not believe the NIETC process will be required because of the success the company has had with the state approval process in the past.

Also, PJM identified that generators were not being sufficiently compensated for the electricity they were generating. Consequently, since generators were not earning sufficient revenues, the result was that some generating units were retired or were not being infused with adequate capital investment. Also, additional generation needed to meet growing and future demand was not being built.

Because there is no practical way to store electricity after it has been generated, power grid operators constantly must match electricity production with electricity use. When electricity use increases, grid operators call on power plant owners to generate more electricity. To maintain the highly reliable supply of electricity we have come to expect, grid operators always have some generating capacity in reserve to meet increasing use or make up for plants that unexpectedly shut down.

That "reserve margin" has been declining in recent years as the growth in electricity use has outpaced the addition of new generating sources. These tighter reserve margins are affecting the balance between supply and demand, and are contributing to higher electricity costs.

In response to these various factors, PJM changed the structure of its competitive markets. These changes, which instituted a reliability pricing mechanism (RPM) and revised the price that PJM believes is appropriate to send the right signals for new generation to be built called the cost of new entry (CONE), appear to be working. These mechanisms seem to be helping to provide the correct incentives companies require to make decisions to build the new power plants that are needed—and to build them in the right locations—to meet current and future demand.

That is a basic overview of the energy business and energy markets in the PJM region. What does the future look like?

Energy prices are increasing everywhere—in deregulated states and in states where the electricity business remains regulated. Prices are going up for a few main reasons. On the supply side, the prices of fuel used to generate electricity—primarily uranium, natural gas and coal—have increased dramatically. The price of coal has increased 56 percent and natural gas has gone up 200 percent since 2000. Uranium prices on the spot market have gone from about $10 a pound in 2000 to $65 a pound today—an increase of 550 percent.

Costs of other key components of generation and transmission, such as steel, labor and other factors, have also risen significantly. On the demand side, the country continues to use more electricity. PJM has seen a 1.6 percent annual increase in electricity demand.

In many states, including Pennsylvania, where policymakers recognized the benefits that competitive electricity markets can bring, transition periods with capped rates are coming to an end, and customers are seeing or will be seeing increases in prices of electricity. However, these price increases are not the result of competition. They are the result of significant and sustained increases in fuel prices and costs of materials needed to generate and distribute power. And these price increases are occurring in regulated jurisdictions as well as non-regulated jurisdictions.

PPL firmly believes that competition will bring lower prices to consumers in the long run, and that competition has a number of other benefits as well. Competitive wholesale electricity markets have shifted the risk of building and operating generation from consumers to generators, and it is competitive wholesale electricity markets that will ensure reliable and lower cost energy supplies for consumers while promoting development of renewable energy and conservation.

What can be done to address higher energy prices? PPL is taking steps on a number of fronts. We are working to increase generation infrastructure, we are working to increase electricity transmission infrastructure, and we are working aggressively with customers to help them use energy more efficiently.

Increasing generation capacity is important for our nation's energy security, and to be able to meet growing customer demand for electricity. There is no single solution to this issue, and the answer lies in a portfolio approach to new sources of generation coupled with demand-side management and conservation programs.

Regarding generation sources, non-carbon sources should be promoted—including renewable sources, clean coal technologies and nuclear power. PPL already generates about 40 percent of its electricity using non-carbon sources, and as a major generator, we recognize the need to address climate change in a reasoned way. Reducing greenhouse gas emissions requires the development of new technologies and regulations that support capture and storage of carbon dioxide emissions so that we can continue to use coal—our most abundant domestic energy source—as part of our future energy mix.

In the meantime, we face important decisions on how to meet increasing demand for electricity to power our economy and support our quality of life. Renewable energy is an important, but intermittent, source of electricity, and its cost is still high. It should be developed wherever possible, but renewable energy alone will not fulfill the country's future energy needs. Continuing uncertainties about climate change legislation make coal an unlikely choice. Natural gas has significant cost concerns as the rate of use grows faster than increases in production. Nuclear energy does not emit carbon and has a strong safety record, but questions remain about the cost, and the political and regulatory climate.

At PPL, we are considering whether to build a new nuclear power plant adjacent to our existing power plant in Berwick, Pa.; we are implementing plans to increase the output of our existing nuclear units by nine percent; we are expanding renewable hydroelectric generating capacity in Pennsylvania, Montana and Maine; we are investigating opportunities to build new, efficient natural gas-fired generating plants; we have supported research into carbon capture and storage technologies that would enable continued use of our abundant coal resources; and we are expanding our growing renewable energy business, which invests in wind, solar and landfill methane generation projects.

We are preparing a Combined Operating License application for a new nuclear unit, which we expect to submit to the U.S. Nuclear Regulatory Commission before the end of this year. Expanding nuclear power is essential for the nation's energy policy. With reserve margins declining, and carbon regulation on the horizon, nuclear power is an increasingly attractive option to provide the nation with reliable, affordable, baseload electricity.

At PPL, we are optimistic about the ability of nuclear energy to significantly increase our generating capacity in the United States. But with the significant cost of nuclear generation, the financial backing of the Federal Government, in the form of loan guarantees, will be essential if new projects are to move forward. We encourage legislators to build on the foundation of the Energy Policy Act by supporting a workable, effective and stable loan guarantee program—a key element for a successful renaissance of nuclear energy in the United States.

We also have made significant gains in improving the operating efficiency of existing power plants, largely due to incentives created by the competitive wholesale energy markets where PPL does business. Plants that in a regulated environment operated about 75 percent of the time currently operate more than 90 percent of the time in a competitive market. Getting the most out of existing resources has enabled PPL and other generators to defer new power plant construction for several years.

PPL produces about eight percent of its energy from renewable sources, including hydroelectric generation. We currently own, operate or are developing about 950 megawatts of hydroelectric generating capacity and a total of 30 megawatts of capacity of renewable energy projects, including two projects that have been honored by the U.S. Environmental Protection Agency.

In addition, PPL has made a 20 year commitment to buy the electricity generated at two wind farms in Pennsylvania and has agreed to buy half of the renewable energy credits produced by a new wind farm in West Virginia. The three projects total 132 megawatts of renewable energy. PPL has 10 megawatts of solar generation, either in place or under construction or contract, in New Jersey; and we continue to look for new opportunities to develop solar generation as part of our larger renewable energy portfolio. We plan to invest more than $100 million in new renewable energy projects and another $500 million in hydroelectric projects through 2011.

Regarding helping our customers use energy more wisely, we now have in place a web-based tool that allows our regulated delivery customers in Pennsylvania to

view their daily electricity use, and, in the very near future, their hourly electricity use. This tool gives customers a better understanding of how their homes use electricity and provides personalized tips to save. This fall, we distributed more than 150,000 compact fluorescent light bulbs to customers in our service territory to help them reduce energy use, raise awareness about energy efficiency and encourage them to use the Energy Analyzer online.

We have arranged with an independent, nonprofit company to bring our customers an online store that sells a wide variety of energy-efficient products. PPL Electric Utilities customers can receive a 20 percent discount on all items they buy.

We are also supporting rebates for small businesses that upgrade their lighting and providing grants for companies that "go green" when renovating or building new commercial or industrial facilities. Grants are available for companies that seek a "green" certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design program.

Last but not least, we are reaching out to customers through community presentations, home shows, energy fairs, advertisements and a newsletter inserted with customer bills to promote energy efficiency.

In summary, our view is that the essential elements of a national energy policy include a commitment to domestic resources, a program to encourage "clean coal" technologies, nuclear power initiatives, new electricity transmission infrastructure, research and development of renewable power, and effective demand management and conservation measures.

The CHAIRMAN. Thank you, Mr. Champagne. Mr. James.

STATEMENT OF REVIS W. JAMES, DIRECTOR, ENERGY TECHNOLOGY ASSESSMENT CENTER, ELECTRIC POWER RESEARCH INSTITUTE, WASHINGTON, D.C.

Mr. JAMES. Thank you, Mr. Chairman, Ranking Member Lucas, and Members of the Subcommittee. I am Revis James of the Electric Power Research Institute. I direct the Energy Technology Assessment Center at EPRI. EPRI is a 30 year-old nonprofit research foundation that has been focused on the electric sector, and we are focused primarily on the U.S. but also on quite a lot of the other areas of the world.

A unique convergence of major challenges is facing the electric sector currently; substantial long-term growth and electricity demand, decreasing margins between maximum generation capacity and maximum loads, and anticipated CO_2 emissions constraints, which we expect soon.

While significant expansions of electric generation capacity and transmission systems are needed to support demand growth and maintain system reliability, accomplishing substantial and permanent reductions in electricity-related CO_2 emissions will require new technology capabilities.

Our analysis has shown that a full portfolio of advanced technologies would enable substantially lower emissions from the electric sector by 2030, on the order of 45 percent less in comparison to business-as-usual projections by the Energy Information Administration.

But it is clear that there is no silver bullet. Achieving such reductions relies on a portfolio consisting of advanced levels of both performance and increased deployment of several technologies: end-use efficiency, renewables, advanced coal with CO_2 capture and storage, nuclear power, plug-in hybrid electric vehicles, and distributed energy resources.

Furthermore, many of these technologies haven't yet reached the levels of performance and deployment that would be necessary to enable the kinds of emissions reductions that I just discussed. Sus-

tained, focused research development and demonstrations are going to be needed over the next 20 to 25 years in order to realize that full portfolio of advanced technologies.

Meeting these challenges will result in increased cost of electricity. Substantial deployment costs for new power plants and transmission infrastructure and new costs for CO_2 emissions reductions are going to be principal factors. The commercial availability of key technologies will take different lengths of time to develop, and cost of materials and labor have been rising at significant rates.

EPRI's economic analyses indicate that investments in RD&D can significantly reduce the costs of future climate policy through earlier availability of a wide array of technology options. Wholesale electricity production costs will increase much less with a full portfolio of advanced technologies.

A very important part of this technology benefit is the eventual availability of, relatively speaking, decarbonized electricity for the remainder of the industry and enabling the rest of the economy to reduce it emissions.

Differences in the time to full technology availability and the risk of unforeseen RD&D barriers reinforces the importance of concurrent aggressive RD&D, and demonstrations in particular, to minimize the time before the full portfolio will become available.

Collaborating with its networks of technical advisors from across the electric sector, EPRI has identified several critical technology demonstration projects, which are central to the development of this whole portfolio. We have created a framework for each of these projects, and we are currently pursuing their development and implementation.

To summarize, our research concludes that to serve increasing demand for electricity and at the same time substantially reduce CO_2 emissions, first, we are going to have to substantially decarbonize generation itself. Second, we are going to have to develop a smart grid, which will enable much more efficient use of electricity. And third, we are going to have to use decarbonized electricity in a wide range of other sections of the economy to enable productions in those other sectors, for example in transportation.

Sustained RD&D, starting now, can help lower the economic impact of creating this low-carbon future. Mr. Chairman, this concludes my vocal remarks, and thank you for the opportunity to address the Subcommittee.

[The prepared statement of Mr. James follows:]

PREPARED STATEMENT OF REVIS W. JAMES, DIRECTOR, ENERGY TECHNOLOGY ASSESSMENT CENTER, ELECTRIC POWER RESEARCH INSTITUTE, WASHINGTON, D.C.

Thank you, Chairman Holden, Ranking Member Lucas, and Members of the Subcommittee. I am Revis James, Director of the Energy Technology Assessment Center at the Electric Power Research Institute (EPRI). EPRI appreciates the opportunity to provide testimony to the Subcommittee.

EPRI is an independent, nonprofit research organization that brings together its members, scientists and engineers, along with experts from academia, industry and other centers of research to:

- collaborate in solving challenges in electricity generation, delivery and use;

- provide technological, policy and economic analyses to drive long-range research and development planning;
- support multi-discipline research in emerging technologies and issues; and
- accelerate the commercial deployment of advanced electricity technologies.

During its 35 year history, EPRI's mission has been to define strategic technical challenges in the electricity sector and to clearly identify viable technology options to address them. In this context, and in anticipation of a low-carbon energy future, EPRI is conducting ongoing research on how climate change and potential goals to reduce greenhouse gas emissions affect the production and delivery of electricity.

A convergence of major challenges: demand growth, decreasing capacity margins, CO_2 emissions constraints

Meeting potential CO_2 emissions constraints and the projected demand growth for electricity is complicated by several risks. Advanced technology provides a path to mitigating these risks while addressing the concurrent challenges of demand growth, anticipated CO_2 emissions constraints, and diminishing generation reserve margins.

Demand growth

Meeting the expected growth in electricity demand and maintaining system reliability presents a major challenge that drives the need for substantial new generation capacity. In its most recent Annual Energy Outlook,[1] the Energy Information Administration (EIA) projects U.S. electricity demand will grow by 29% between 2005 and 2030, an increase in consumption of 1046 TWh. This increase is roughly equivalent to the 2006 electricity consumption of the top five consuming states in the United States: Texas, California, Florida, Ohio, and Pennsylvania. Growth at this scale will demand a huge increase in electricity generating capacity. The magnitude of new generation required to simultaneously meet demand growth and achieve major reductions in CO_2 emissions will be enormous. The Energy Information Administration estimates than 200 GW of new generating capacity,[1] for example, will be required to meet U.S. electricity demand in 2030, highlighting the need for low-carbon generation sources to ensure this growth is accomplished with fewer emissions.

Decreasing capacity margins

Expansion of generation and transmission resources has not kept pace with electricity demand growth, leading to decreasing margins between peak consumption and generating capacity. The deployment of new capacity is also a priority to ensure electricity grid reliability and stability. The North American Electric Reliability Corporation (NERC) estimates that these margins will decrease below acceptable levels between 2009–2015 in the eight U.S. reliability areas.[2]

CO_2 emissions constraints

It is clear that goals for reducing greenhouse gas emissions and the timeframe over which they will be targeted are likely to be large and very demanding. Significant progress on reducing emissions will have to begin very soon and continue for many decades if probable goals are to be met. Most of the proposals discussed to date require large scale emissions reductions by 2050 over most or all of the economy. The magnitude of these reductions can be appreciated by considering the difference between current annual emissions levels and projected 2050 levels based on the proposed legislation. This difference is over 1½ times the total CO_2 emissions from *all* U.S. electric utility companies[3] in 2006. In essence, expected emissions constraints will ultimately require almost no emissions from new generating capacity while reducing emissions from the existing fleet, either via reduced electricity consumption, increasing efficiencies of existing coal and gas plants, or retrofitting CO_2 capture on existing coal and gas plants.

Additional factors complicate risk mitigation

- Timing of technology deployment: The commercial availability of key technologies will take different lengths of time to develop and deploy. Delays could have significant impacts on electricity costs, the generation mix, and the ability to meet a given emission constraint.
- Costs: The costs incurred to deploy advanced technologies will be substantial, but will ultimately prove to be a valuable investment in leading the electricity sector to decarbonization. Moreover, because many of these technologies are not yet commercially mature, cost uncertainties exist until they have been demonstrated at large scale.

Timing of Technology Deployment

Recent EPRI work [4] has illustrated the necessity and the urgency to develop a full portfolio of advanced electricity technologies as part of the solution to satisfying our future energy needs in an environmentally responsible manner. Our analyses suggest that with aggressive research, development, demonstration, and deployment of advanced electricity technologies, it is technically feasible to slow down and stop the increase in U.S. electric sector CO_2 emissions, and then eventually reduce them over the next 25 years while simultaneously meeting the expected increased demand for electricity and minimizing the economic impact of reducing emissions.

To develop this analysis, we compiled data on the current and likely future cost and performance of various electricity technologies from our own internal work, various public-private technology research, development, and demonstration (RD&D) roadmaps, and expert opinions from academia, industry, and the NGO community in the published literature. From this information, EPRI assessed the benefits of achieving substantial improvements in performance and aggressive deployment of advanced technologies in seven areas: end-use efficiency, renewables, nuclear generation, advanced coal generation, CO_2 capture and storage (CCS), plug-in hybrid electric vehicles (PHEV) and distributed energy resources (DER). We then calculated the net change in CO_2 emissions from the electric sector which would result from achieving each of those technology targets compared to the underlying assumptions in the reference case of the 2008 Annual Energy Outlook published by the Energy Information Administration (EIA). [1] The calculated potential for CO_2 emissions reductions is based solely on the technical capabilities, assuming no economic or policy constraints. Called the PRISM analysis because of the spectrum-like appearance of its graphical representation (*Figure 1*), the study's major finding is that it is technically feasible to halt and ultimately reverse the currently rising trend in CO_2 emissions from the electricity sector. If aggressive RD&D of the full portfolio of advanced technologies is successful, annual emission levels could be reduced by roughly 45 percent relative to reference-case projections for 2030 in the U.S. Energy Information Administration's 2008 Annual Energy Outlook. [1] There is no silver bullet technology that can provide the majority of potential emissions reductions, but rather a diverse combination of new and existing technologies will be required to meet aggressive emission targets.

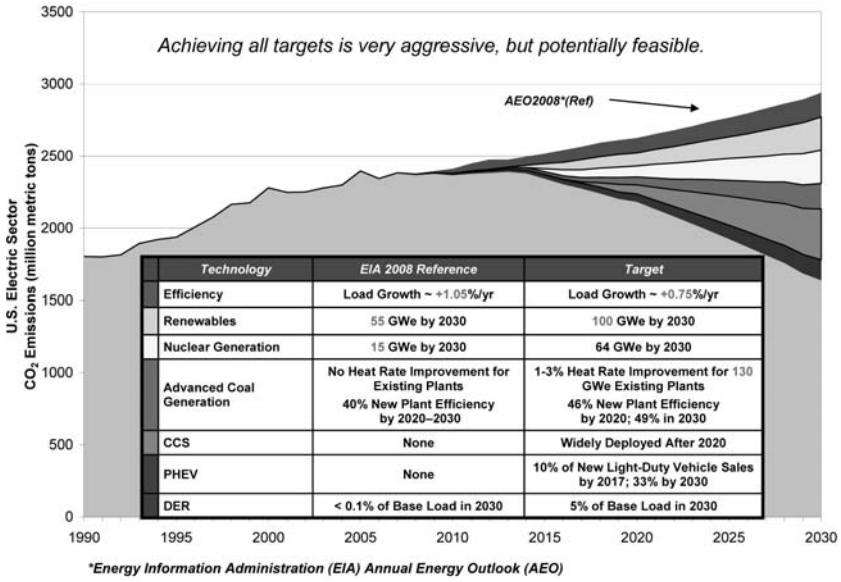


Figure 1: *Technical potential for CO_2 emissions reductions from the U.S. electric power sector, assuming significant new technology RD&D investments and the aggressive deployment of the resulting technologies over the next 25 years.*

Costs

EPRI conducted a companion economic analysis [4] showing that investments in RD&D which lead to the creation of a full portfolio of advanced, low-carbon elec-

tricity technologies, including advanced coal-based power plants with CCS and new expansions in nuclear power, can significantly reduce the costs of future climate policy. For a scenario in which we aspire to reduce U.S. emissions of CO_2 in 2050 to less than half of today's levels, this "full portfolio" would result in average wholesale electricity prices equivalent to approximately 9¢ per kilowatt-hour, compared to 21¢ per kilowatt-hour—more than twice as much—in the case where a "limited portfolio" of electricity technologies (i.e., excluding CCS or expansion of nuclear power) is available. Carbon prices are also twice as large in the world of the "limited portfolio". In a world without CCS and nuclear, future CO_2 constraints would be met by massive fuel switching to natural gas (with resulting price increases and increasing import dependence) and by increasingly expensive energy conservation as consumers respond to very large carbon and electricity prices.

For this hypothetical CO_2 constraint, the existence of the "full portfolio" reduces the overall cost of the climate policy to the U.S. economy by approximately $1 trillion between now and 2050. Furthermore, the low-cost, low-carbon electricity provided by the "full portfolio" would play an essential role in enabling CO_2 reductions from other sectors of the economy.

Transition to a Low-Carbon Future

Since the key technology capabilities in the full portfolio will take different lengths of time to develop and deploy, their relative importance within the portfolio will shift over time. Over the decade of 2010–2020, availability of cost-effective and efficient CO_2 capture technology or of commercial CO_2 storage sites is unlikely, and little or no deployment of new nuclear plants will occur. During this period, natural gas, wind and biomass, demand reduction, and improvements to existing coal plant heat rates are likely to be particularly important. The lack of availability of larger baseload generation options will make capacity planning much more uncertain. Combined with CO_2 emissions reduction policies, consequences of this initially more limited technology availability will result in higher electricity production costs and natural gas prices. Rising electricity and CO_2 costs will drive technology development. Beyond 2030, emergence of significant deployments of nuclear, advanced coal with CCS, wind and biomass will expand the technology portfolio. However, delays in technology development will directly affect the ultimate costs of achieving CO_2 emissions reductions.

The importance of multiple technologies within an economically optimal portfolio, coupled with the risk of unforeseen barriers in technology development reinforces the importance of concurrent, aggressive RD&D actions to maximize options by which the full portfolio can be achieved. In addition, full scale technology demonstrations for the key technologies will determine the time that it takes to reach full availability of the full portfolio.

EPRI's Response to the Challenges: Technology Demonstrations

Based on its 2007 research,[4] EPRI identified four major technology pathways in which substantial RD&D progress will be needed over the next 20–30 years to achieve the full portfolio of advanced technologies that will allow demand growth to be met while minimizing the cost of compliance with a CO_2 emissions constraint:

- Development and demonstration of smart distribution grids and communications infrastructures to enable widespread end-use efficiency technology deployment, distributed generation, and plug-in hybrid electric vehicles.
- Development and demonstration of enhanced transmission grids and associated energy storage infrastructures with the capacity and reliability to operate with 20–30% intermittent renewables in specific regions of the United States.
- Expanded deployment of advanced light water reactors enabled by continued safe and economic operation of the existing nuclear fleet.
- Development and demonstration of commercial-scale coal-based generation units operating with 90% CO_2 capture and with the associated infrastructures to transport and sequester the captured CO_2.

EPRI subsequently identified particularly critical technology demonstration projects within these technology pathways necessary to ensure long-term achievement of the full portfolio. In concert with its network of technical advisors from across the electric sector, EPRI technical experts evaluated several candidate projects before identifying the following six for immediate action:

- Post-Combustion Carbon Capture and Storage Demonstrations.
- IGCC With Carbon Capture and Storage Demonstration.
- Ion Transport Membrane for Low-Cost Oxygen Production.
- Advanced Compressed Air Energy Storage Demonstration.

- Energy Efficiency Demonstration.
- Smart Grid Demonstrations.

The above projects address pivotal technologies within the full portfolio which contain considerable technology uncertainty associated with performance, ease of scale-up, and cost. Through large scale demonstrations, these projects will ultimately enable commercially viable deployments of key advanced technologies. EPRI has created a collaborative framework for each of these projects and is currently pursuing them.

Conclusion

Decarbonization of electricity generation, development of a smart grid, and increasing use of electricity in other major economic sectors, such as transportation, will all occur in response to the combination of CO_2 constraints and demand growth. Since all of the needed technology capabilities do not yet exist or are not yet economically available, the U.S. faces an unavoidable period of responding to demand growth and emissions reductions with a limited technology portfolio. If emissions reduction targets currently under serious discussion are to be achievable and affordable, a sustained and focused RD&D program is needed to develop, demonstrate and eventually deploy the full portfolio of advanced electricity technologies. A decarbonized electricity sector is the key to meeting economy-wide CO_2 emissions goals.

Timely, sustained collaborative RD&D can enable a low carbon future while lowering the cost of compliance with CO_2 constraints, but concurrent actions in several technology areas must begin now to minimize this cost while continuing to meet demand growth. Thank you for the opportunity to address the Subcommittee.

Endnotes

[1] "Annual Energy Outlook 2008", Energy Information Administration, U.S. Department of Energy, June 2008, DOE/EIA–0383(2008), *www.eia.doe.gov.*

[2] "2007 Long-Term Reliability Assessment: 2007–2016", North American Electric Reliability Corporation, October 2007, *www.nerc.com.*

[3] "Benchmarking Air Emissions", National Resources Defense Council, *http://www.nrdc.org/air/pollution/benchmarking/default.asp.*

[4] "The Power to Reduce CO_2 Emissions: the Full Portfolio", EPRI 1015461, August 2007, *www.epri.com.*

The CHAIRMAN. Well, thank you, Mr. James. Secretary Nichols.

STATEMENT OF HON. JIM NICHOLS, FORMER SECRETARY OF AGRICULTURE, STATE OF MINNESOTA; FORMER SENATOR, STATE OF MINNESOTA, LAKE BENTON, MN

Mr. NICHOLS. Thank you, Mr. Chairman, and thank you for the opportunity to come here with you and Colin Peterson. Very briefly, I will summarize my testimony and talk fast. Colin and I served together in the Senate, and we passed progressive legislation in Minnesota. My testimony says that.

Over 14 years ago, Mr. Chairman, we passed our mandates for wind and ethanol, and it saved us actually $4 billion now. So we are very fortunate.

My first handout there, if you go with me, it shows the price of E85 a week ago in Minnesota was $3.49. Today it is $3.29. Talked to the cabbie coming in here that brought me. He paid $3.99, and it was over $4 here in Washington. So if you have a progressive energy policy in the state, it saves you a lot of money. So I am lucky to get to live there.

Also the thing I want to emphasize, the next thing in front of you I signed a power contract—I have a wind turbine on my farm—for 3.35¢. Wind energy is the cheapest power in America. There is nobody that can generate it for 3.35¢, and I wish the REAs would participate a little bit more on this because we could provide a lot of cheap power to the REAs.

The reason why Minnesota has Xcel Energy, their cost to the consumer is 6.6¢, Mr. Chairman, because they get 41 percent of their power from non-fossil fuel sources, wind, hydropower, and nuclear.

I grow energy on my farm, and let us never forget this, I grow distiller's grain. People think somehow we are causing a food shortage. Actually when we run our corn through the fermentation, as you well know, Mr. Chairman, we get a better food product in a high protein distiller's grain.

Now, here is the problem. We would like to build more turbines, and I was the first farmer owned turbine in my county. I own it with my brother and our families, wives and our kids. All of the other turbines are owned by corporations, and the reason for that, Mr. Chairman, is because you have a law, as you well know, the production tax credit, that is only for corporations.

Worse than that, the major owners of wind turbines in America beyond GE and FDL, are foreign corporations. So now we have created a situation where, because of the corporate tax credit, most of our wind turbines are owned by foreign corporations. And that is what surrounds me.

Now, we would like to build more. We could supply 10,000 homes with electricity on our two farms. We are not big farmers. And they could plug in their cars at night so 10,000 cars at well, just for two farms, Mr. Chairman. The problem is you got to buy them in Euro dollars.

And the next document there shows what I paid for the turbine was $1.5 million to build 1.5 megawatt turbine. To build a coal plant now, and the document includes that, it costs $3 million per megawatt to build a turbine. Wind energy has historically been $1 million a megawatt, and the wind is free. It is the cheapest power in America.

But because our tax credit expires every 2 years, as you know—and I commend the House. You passes a pretty good energy bill. The Senate—enough said about that.

Well, anyhow, we keep hoping out in the countryside you guys actually do some things here because it is discouraging. But it increases the cost of a turbine by $600,000 just in the exchange rate. Most of the turbines in America are installed by three major companies, Vestas, Siemens, and Gamesa. And Gamesa is a Pennsylvania company, I think. At least they have a factory in Pennsylvania. Is that correct?

So we are getting more here, but still on half the bids, Mr. Chairman, you have to buy them in Euro dollars. And the GE turbine is a German turbine that is assembled here. Now, we are getting better because we build a lot of blades here now and a lot of towers. But they still want to charge you in Euro dollars. And because there is such a demand, I am on a 2 year waiting list to get a turbine. And if you argue about price, you are off the list.

We need American manufacturers, Mr. Chairman, and that is my plea here. If we had a longer term tax credit, the manufacturers—you know you are going to make money in this business. And you know there is a demand. Everybody else is on a 2 year waiting list. If we can get American manufacturers, then we could get cheaper prices for our turbines. And the problem is if your turbines cost a

lot of money because of the Euro dollar, that has to be reflected in the price to the consumer.

So we can't build $4 million of megawatt anymore like we used to. It is closer to $2 million a megawatt. It is still cheaper than coal and anything else, but we can get back to $1 million there.

Now, I really want to encourage you—and that is part of the plan the Department of Energy has—the 20 percent energy by 2030. It creates 500,000 jobs. And with that, they have their transmission. That is the other color thing you have in front of you, Mr. Chairman. We need to build a transmission system. Now, we have done a lot in Minnesota. The problem is when you get outside of your state, it is harder. You know, we can mandate wind and ethanol in Minnesota, and we can build transmission.

But the real customers are in Los Angeles and New York and the big cities. There are only 800 farmers in my county, and my turbine supplies 500 homes. You know, the market is not—the power is out in the Midwest, but the customers are in the cities. The beauty of it is it moves at the speed of light.

A wind turbine is better than an oil well. I will finish up here. It produces more energy. I want to get into that. And it moves at the speed of light. This is a crop that I grow on my farm, instantly convert wind to energy and transport at the speed of light to my customers that live in Minneapolis and St. Paul, and it is there just like that. No pollution.

So now just very quickly, if we could get to the plug-in hybrids, Mr. Chairman, and you have the handout there on the Ford Escape—we are Americans—we are not going to drive those little cars or anything like that. I drive a four-wheel-drive pickup, and you probably do too. You can't live without it.

But T. Boone Pickens is right. All those pickups that we drive should be converted to run on natural gas, compressed natural gas, propane. We did it in the 1970s, and we can do it again. The conversion kit is pretty cheap. So we can convert the existing vehicles we have to natural gas, and we can go the plug-in hybrids.

Quickly to economics: My pickup uses—it is 15 miles to the gallon so it takes two gallons to drive 30 miles and more because I drove to the airport fast this morning. Usually it costs me almost $80 to fill the thing, but if I could plug it in, it takes 10 kilowatt hours to charge up the car. And I can drive 30 miles. I pay 7.2¢ for my REA co-op. So for 72¢, I could drive 30 miles if I could plug it in. But because I got to buy gas from the oil companies and the Arabs, it costs me $7.20. I could cut my fuel cost by 90 percent if we can solve this problem, Mr. Chairman.

And finally, people don't realize this that wind turbines, they are oil wells. Our wind turbine, at full production, produces as much as 21 barrels of oil. We have a half a million oil wells, 507,000 oil wells in America. Those oil wells on average produce 10.3 barrels but 400,000 of them are stripper wells, and they produce 2½ barrels. A wind turbine will produce 10 to 12 barrels on average every day. A wind turbine is an oil well, Mr. Chairman, and it will never run dry. Thank you.

[The prepared statement of Mr. Nichols follows:]

PREPARED STATEMENT OF HON. JIM NICHOLS, FORMER SECRETARY OF AGRICULTURE, STATE OF MINNESOTA; FORMER SENATOR, STATE OF MINNESOTA, LAKE BENTON, MN

For the record my name is Jim Nichols. I have lived and farmed my entire life at Lake Benton, Minnesota. I had the privilege of serving four terms as a Minnesota State Senator and Minnesota Secretary of Agriculture. I served in the state Senate with my friends and colleagues that served here in Congress, Collin Peterson, Tim Penny, Gerry Sikorski and Bill Luther. Almost 15 years ago we passed legislation in Minnesota that mandated renewables, ethanol and wind. That legislation has saved Minnesotans more than $2 billion dollars in energy cost and I was pleased to have been a part of that legislation. This year Minnesota passed even more progressive legislation that requires 25% wind energy by 2025. Governor Tim Pawlenty has proposed to increase the required 10% ethanol blend to 20%. T Boone Pickens brought an excellent message to Congress last week and we have already adopted much of his message in Minnesota.

My first two documents show the current price of ethanol blended gasoline in Minnesota at $3.49 per gallon and the Power Purchase contract that we signed with Xcel Energy in Minneapolis at a contract price for electricity of 3.35¢ per kilowatt hour and that price is locked for the next 25 years. Xcel Energy provides power to its consumers for 6.6¢ per kwh which is some of the cheapest power in America. Xcel Energy now gets 41% of its power from non-fossil fuel sources—wind, hydropower and nuclear. Consumers in Los Angeles now pay 14¢ per kwh and New Yorkers pay 12¢ per kwh. It is nice to live in a state that has an energy policy.

I own and operate my 630 acre farm and I grow energy and a high protein feed—distillers grain. Each year I produce 180,000 gallons of ethanol from the corn on my farm. Four years ago we purchased and built a 1.5 megawatt wind turbine on my farm and now produce the electricity for 500 homes. I own that wind turbine with my brother Kelly and our wives and children. Our grandchildren will be producing energy on that farm 100 years from now. We have plans to build 20 wind turbines on our farms and produce electricity for 10,000 homes. We cannot buy a wind turbine at this time because there is a 2 year waiting list. All of the wind turbines now standing in America are supplied by eight manufacturers. Three European manufacturers have most of the market. The European manufacturers are Vestas, Siemens and Gamesa. The GE Energy turbine is a German turbine assembled in America. The other manufacturers are Suzlon from India and Mitsubishi from Japan. Clipper and Acciona also have a small market share. We now manufacture many of the towers and blades in America but each turbine is sold as a package and the towers and blades are part of the package and usually must be purchased with Euro dollars.

The next article shows wind projects stopped in South Dakota and around the nation because Congress has failed us once again. The House of Representatives did pass a pretty good energy bill and I commend you for that. The Senate did not pass a good energy bill. Wind turbine costs have moved closer to $2 million per megawatt in the past 3 years because the exchange rate for the Euro dollar is now $1.60. I have price quotes with me for turbines that I would like to purchase and you can see that the payment must be in Euro dollars. We have no American manufacturers because the tax credit for wind energy expires every 2 years. The tax credit is for corporations only and with six major corporations owning most of the turbines in America there are no buyers without the corporate tax credit. Four of the major corporate owners of wind turbines are foreign corporations with a U.S. subsidiary. I do not understand why Congress would give a tax credit to foreign corporations and not give an energy tax credit to American citizens. A longer term tax credit would immediately create American manufacturers. The wind industry invested $9 billion in America in 2007 and will create 500,000 jobs if we adopt the Dept of Energy plan for 20% wind energy by 2030 (document cover is attached, the full report can be accessed at *http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf.*) I contrast that with the big oil companies that have not built a refinery in 30 years and as you can see in the next article the big oil companies are not investing their profits in oil exploration. More than 70% of the exploration oil wells in America are now being drilled by the small, independent oil producers. These independent oil producers are investing in America.

The next document shows that the actual cost of our turbine was $1.5 million for a 1.5 megawatt turbine and the document shows that the construction cost of a new coal plant proposed on the Minnesota border is $3 million per megawatt. The constructed cost of wind turbines has historically been $1 million per megawatt and the wind is free. With the escalating price of coal, and the expensive construction costs of coal plants, the American consumers are facing very high prices for electricity if Congress does not enact an energy policy. T. Boone Pickens is absolutely

right when he says that we should use compressed natural gas to power our trucks and buses and not to generate electricity.

The next document shows that wind energy and electricity can solve our fuel crisis. Ford now has the Escape plug-in hybrid that will get 120 miles per gallon and cut fuel costs by 90%. My truck that I drove to the airport this morning gets 15 miles per gallon. It takes two gallons and costs me $7.20 to drive 30 miles. It takes 10 kilowatt hours to provide the charge to drive 30 miles. I pay 7.2¢ per kwh on my farm so a plug-in hybrid would cost 72¢ to drive 30 miles.

The last document from the Dept. of Energy is the proposed transmission map for America. This transmission system will be paid for with a user fee and will give consumers in Los Angeles and New York access to the cheap energy that we have in the Midwest. That electricity will move at the speed of light from the farm fields to the big cities.

We now produce five million barrels of oil per day from the 507,000 oil wells in production in the United States, including Alaska and offshore. The average oil well produces 10.3 barrels per day. At full production a 2 megawatt turbine produces as much energy as 28 barrels of oil per day with an average of 12 barrels per day. The conversion factor for wind is 3,412 BTU per kwh and for oil is 5,800,000 BTU per barrel. With 500,000 wind turbines we can produce as much energy as we now produce from oil in America. The combination of oil and wind will produce 66% of the power needed for our cars. Ethanol, Biodiesel and Natural Gas will provide the remaining 33%. We must continue to grow corn, soybeans and cellulose and we must continue to drill new oil wells in America. The wind turbines will never run dry.

ATTACHMENT 1

ATTACHMENT 2

ARTICLE II

PURCHASE AND SALE

2.1 **Term**. This Agreement shall be effective upon execution by authorized representatives of both Parties, and shall continue unless otherwise terminated in accordance with its terms until the end of the 25th year after the Commercial Operation Date. NSP's obligation to purchase the Capacity and Net Energy of the Plant as set forth herein shall be effective on the Commercial Operation Date.

2.2 **Sale and Purchase.** NSP agrees to purchase the entire Capacity and Net Energy of the Plant during the Term and to accept delivery of the Capacity and Net Energy at the Point of Interconnection during the Term, subject to the terms of the Agreement. Seller agrees to deliver and sell the entire Capacity and Net Energy from the Plant to NSP at the Point of Interconnection for the Term. Seller shall not contract to sell any Energy or Capacity from the Plant to any Person other than NSP for the Term and Seller acknowledges that NSP is entitled to receive all Capacity and Energy from the Plant during the Term.

2.3 **Guaranteed Price.** NSP shall pay Seller for the Net Energy delivered to NSP based on the Guaranteed Prices set forth in Appendix A. NSP and Seller agree that the applicable Guaranteed Price is intended to compensate Seller for both the Net Energy and Capacity delivered to NSP, and that Seller is not entitled to a separate price or payment for the Capacity of the Plant to which NSP is entitled. NSP shall purchase all Trial Energy produced by the Plant during startup and testing at the price set forth in Appendix A.

PRICING

1. Guaranteed Price. The Guaranteed Price for Net Energy, Capacity and Green Tags purchased by NSP during the Term and delivered to the Point of Interchange shall be $33.50 per MWh. 3.35¢

   Net Energy shall be measured by the meter located at the Point of Interconnection and rounded to the nearest MWh. The adjusted reading shall be used as the basis for billing NSP.

2. Trial Energy. NSP shall purchase all Trial Energy generated by the Plant, measured and adjusted as described in paragraph 1, at a price of $25.00 per MWh.

ATTACHMENT 3

LARA NIEL / ARGUS LEAD

Turbine blades turn at MinnDakota wind farm east of Brookings. Wind power projects might depend on Congress renewing tax credit

Stalemate threatens S.D. wind industry

Deal on incentives stalled in Congress

BY FAITH BREMNER
Argus Leader Washington Bureau

WASHINGTON – South Dakota's wind energy industry is being held hostage in a high-stakes game of political chicken, delaying construction on new wind farms across the state and causing sleepless nights for at least one utility project manager.

An important tax subsidy for electricity generated from wind, solar and geothermal sources is set to expire at the end of the year, and House Democrats and Senate Republicans are squabbling over whether to extend it for one year and how to pay the $8.2 billion cost.

Projects scuttled when credit isn't renewed

Basin Electric already has ordered the project's turbines and is going forward with its plan to break ground in spring 2010, Rebenitsch said. If Congress fails to renew the tax credit, Basin Electric will pass on the cost to its customers through higher rates, he said.

"I'm the project manager. That's been my call," Rebenitsch said. "I'm very concerned about the production tax credit. I lie awake at night thinking about it quite often."

Congress has allowed the tax credit to expire three times since it was created 16 years ago – in 1999, 2002 and 2004. Each time, installation of new wind projects plummeted, according to the U.S. Department of Energy. Industry experts are betting Congress will renew the tax break late this year or early next year.

However, banks and investors are in no mood to gamble on that, said Wanda Davies, director of development for Navitas Energy, a Minneapolis-based company that builds and sells wind farms. Navitas is building a 200-megawatt plant, the White Wind Farm, near Brookings. The project now is owned by Babcock & Brown. Attempts to reach Babcock & Brown were unsuccessful.

"You're not going to get funding based on the assumption it will be there," Davies said about the overall dilemma facing wind developers. "The bankers are not going to take a risk. If you have a business plan that shows (the project) would work without the production tax credit, you would get the financing. If you say, 'trust Congress,' you're not going to get financing at any affordable rate."

How to pay for credits is at heart of dispute

Fights over how to finance it aside, extending the wind-energy subsidy is popular with members of Congress and President Bush.

The Senate voted 88-8 in April to add the extension to legislation that would rescue banks and homeowners from bad mortgages. The House subsequently stripped the provision out of the mortgage rescue bill because the Senate did not include a way to pay for it.

Senate Republicans refuse to go along with House Democrats' plan to offset the cost of extending the tax credit. That plan consists of raising taxes on deferred compensation for offshore businesses and delaying the effective date for a tax break on foreign interest payments paid by U.S. multinational companies.

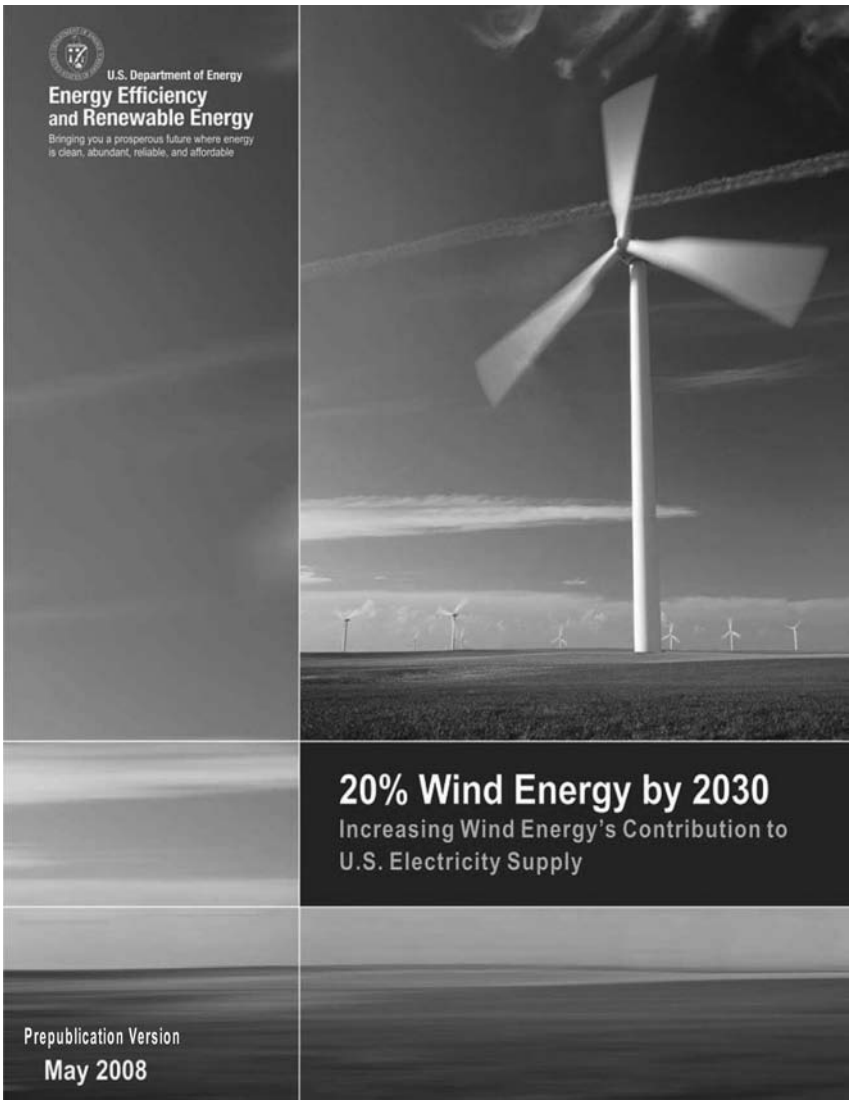
Top S.D. Democrats insist on no borrowing

A handful of Senate Republicans tried but failed to reattach the tax credit measure to the housing bill July 10, once again with no offsets to its $8 billion cost. The tax credit extension remains in limbo with no resolution in sight.

House Democrats, led by the fiscally conservative Blue Dog Coalition, have a rule that all new spending, unless it's for an emergency, must be paid for by trimming costs somewhere else in the federal budget or by raising fees or taxes. The Senate does not have a similar requirement.

"This isn't emergency spending," said Herseth Sandlin, a member of the Blue Dog Coalition.

ATTACHMENT 4



ATTACHMENT 5

Big Oil is making big money, but critics say it's misspent

● Industry giants are putting more dollars into stock buybacks and dividends than the search for new reserves of petroleum.

By JOHN PORRETTO • Associated Press

HOUSTON – As giant oil companies like Exxon Mobil and ConocoPhillips get set to report what will probably be another round of eye-popping quarterly profits, just where is all that money going?

The companies insist they're trying to find new oil that might help bring down gas prices, but the money they spend on exploration is nothing compared with what they spend on stock buybacks and dividends.

It's good news for shareholders, including mutual funds and retirement plans for millions of Americans, but no help to drivers dealing with the high cost of fuel.

Oil profits continues: Critics say industry is too focused on stock. D2 ►

Big Oil investing big cash in stock buybacks

◄ OIL PROFITS FROM D1

The five biggest international oil companies plowed about 55 percent of the cash they made from their businesses into stock buybacks and dividends last year, up from 30 percent in 2000 and just 1 percent in 1993, according to Rice University's James A. Baker III Institute for Public Policy.

The percentage they spend to find new deposits of fossil fuels has remained flat for years, in the mid-single digits.

The issue has become more sensitive as lawmakers and Americans frustrated by high gas prices have balked at reports of oil industry profits. ConocoPhillips is to kick off the latest round of Big Oil earnings reports Wednesday.

Oil prices are set on the open market, not by the oil industry. But that hasn't stopped public protests, a series of congressional grillings for top oil executives, and a failed attempt by lawmakers to slap Big Oil with a windfall profits tax.

In the first three months of this year, Exxon Mobil Corp., the world's biggest publicly traded oil company, shelled out $8.8 billion on stock buybacks alone, compared with $5.5 billion on exploration and other capital projects.

ConocoPhillips has already told investors that its stock buybacks for April to June of this year will come to about $2.5 billion — nine times what it spent on exploration.

Stock buybacks are common in corporate America. They shrink the amount of stock on the open market, essentially increasing its value and giving individual shareholders a bigger stake in the company.

But some critics say Big Oil focuses too much on boosting stock prices, in an industry that sometimes ties executive pay to stock price. And in focusing on buybacks and dividends over exploring for new oil, some critics say, oil companies jeopardize their share of world supply.

"If you're not spending your money finding and developing new oil, then there's no new oil," said Amy Myers Jaffe, an energy expert at Rice University who has studied spending patterns of major oil companies.

Investor-owned companies like Exxon Mobil and Chevron hold less than 10 percent of global oil and gas reserves, way down from past decades. And finding new oil has become harder and more expensive.

State-run oil companies, like those in Saudi Arabia and Venezuela, control about 80 percent of oil reserves.

The cash the biggest oil companies bring in from running their businesses, or operating cash flow, is four times what it was in the early 1990s.

So what's Big Oil to do?

The companies say they are doing what they can to find more fossil fuels around the world, but the easy oil is gone. Exploring these days may mean expensive projects in thousands of feet of water in the Gulf of Mexico or costly ventures pulling petroleum from Canada's vast oil-sands deposits.

TransCanada Corp. and ConocoPhillips Co. just said they'd spend $7 billion to nearly double the amount of crude flowing through a pipeline from Canada's tar sands to the U.S. Gulf Coast.

Exxon Mobil often touts its $100 million contribution to Stanford University's Global Climate and Energy Project. By contrast, BP says it plans to spend $8 billion over the next decade developing alternative energy using wind, hydrogen and other means.

In Washington, one Democratic proposal would impose a 25 percent tax on "unreasonable" profits of the top five oil companies, which together made more than $120 billion in 2007, and put the money toward a trust fund for investment in alternative energy sources. Republicans say it's a gimmick that won't help at the pump and will discourage domestic oil production.

But Sen. Charles Schumer, D-N.Y., said the fervor for stock buybacks is a clear sign Big Oil isn't interested in new production or alternative energy.

"When you hear that," he said, "it screams out for a windfall profits tax."

ATTACHMENT 6

JJN Windfarm Financials

Project Costs	
Micon Turbine	$ 1,090,000.00
Turbine Construction	$ 259,000.00
MISO Study	$ 41,000.00
Xcel Interconnect	$ 74,000.00
Legal Costs Incurred	$ 4,695.00
Permits County	$ 1,387.00
Accounting Consult	$ 419.00
Wind Easement	$ 3,600.00
Legal Costs Payable	$ 3,000.00
Loan Costs	$ 4,175.00
Freight Estimated	$ 50,000.00
Total Costs	**$ 1,531,276.00**

Cost estimate for coal-fired S.D. power plant escalates

◄ BIG STONE FROM A1

Higher costs would mean higher electric bills for customers, but the bigger question is whether the project itself may be delayed or even jeopardized.

Otter Tail senior vice president Ward Uggerud said that even with the higher estimate, the project would be less expensive than producing the same power from renewable energy or natural gas.

However, environmental leaders challenge those claims, and have said that the plant will emit too much mercury and other air pollutants, diminish stream flow and water quality in the Minnesota River, and consume land with its high-voltage transmission lines.

South Dakota officials approved two important permits for the power plant recently, one of them specifically against the wishes of the Minnesota Department of Natural Resources. The project still needs permits from Minnesota regulators because it includes about 85 to 125 miles of new or upgraded power lines in the state, depending upon which routes are chosen.

PROPOSED POWER LINES FOR MINNESOTA

If a large new coal-fired power plant is built in South Dakota, its major transmission lines will cross into Minnesota. One new line would go from Big Stone to Granite Falls. A second line would also be needed: Either a 41-mile line between Big Stone and Morris, or an 80-mile line between Ortonville and Willmar.

Existing lines that would be upgraded — New lines that would need to be built

Source: ESRI, TeleAtlas, USGS — Star Tribune

UTILITIES INVOLVED

Partners in the Big Stone II power plant project and their ownership percentage:

Western Minnesota Municipal Power Agency, Sioux Falls, S.D.: 25
Great River Energy, Elk River, Minn.: 19.3
Montana-Dakota Utilities Co., Bismarck, N.D.: 19.3
Otter Tail Power Co., Fergus Falls, Minn.: 19.3
Southern Minnesota Municipal Power Agency, Rochester: 7.8
Central Minnesota Municipal Power Agency, Blue Earth,: 5
Heartland Consumer Power District, Madison, S.D.: 4.2

Coal-fired S.D. power plant's price escalates

- A large project proposed near Minnesota's border is stirring concerns about pollution.

By TOM MEERSMAN
meersman@startribune.com

The largest power plant in South Dakota history, a proposal already under fire from environmental advocates for using coal instead of wind, would be 50 percent more expensive than previously estimated, according to utility executives.

Otter Tail Power Co. officials told Minnesota regulators last week that the price of building the coal-burning Big Stone II plant could reach $1.8 billion, up from $1.2 billion, because of higher costs for labor, steel, pollution control equipment and other factors.

At stake are the first major coal-fired power plant to be built in the region in more than two decades, and the interests of seven electric utilities — led by Otter Tail Power — that are partners in the project.

120 mpg may become a real possibility

Escape plug-in prototype shows huge potential

Ford Motor via

Results: A vigorous drive showed 55 mpg, but Ford says up to 120 mpg is reasonable in flatter, moderate driving

Automakers are moving fast to determine whether plug-in hybrid electric vehicles can be put onto the market affordably.

PHEVs can up to triple fuel mileage in short trips, and recharging costs less than gas to go the same distance. It appears that plug-ins cut tailpipe emissions more than enough to make up for any pollution caused by the plants that generate the electricity to charge them.

By James R. Healey

Win-win-win.

"I'll take two," you say. Hold on, sport. Plug-ins require costly additional battery capacity and plug-in rechargers. Regular gas-electric hybrids can't be plugged in and don't have capacity to run battery-only.

Automakers are uncertain how much costlier plug-in hybrids would be over normal hybrids, which, in turn, cost at least $2,000 more than gasoline vehicles.

Still, it's intriguing enough and possible enough to take plug-ins seriously and to drive 'em if you got 'em.

Test Drive examined a prototype Toyota Prius plug-in hybrid last Friday. This time we'll look at a prototype version of Ford Motor's Escape SUV plug-in hybrid.

The Escape plug-in hybrid, on display at the auto show in Washington, D.C., this week, is rolling into service at Southern California Edison, where some will go to individuals to measure results in ordinary driving.

Before delivering it to the show, Ford engineers gave USA TODAY wheel time in the front-drive prototype.

Short take: excellent mileage, extraordinarily smooth integration of gasoline and electric powerplants. Escape's aging design hobbles the package overall, but it's likely to be redesigned by the time a plug-in hybrid version would be available.

Ford, Toyota, General Motors and others developing plug-ins won't yet vouch for the reliability of the lithium-ion batteries probably needed for practical PHEVs. They hope furious development brings long-life, low-cost lithium batteries soon — 2010 or so.

The idea of PHEVs is to run on battery power as long as possible before hailing the gasoline engine for help, with no gas use or tailpipe emissions for that time.

Here's what you probably want to know first about the Escape PHEV: 55 miles per gallon, according to Ford engineers' on-board computer.

That was in 23 miles of snowy suburban driving that included rolling hills, hard acceleration and slick-street wheel spin just for the fun of it. And here's a nugget: Escape's traction control actually allows some wheel spin, which is good on many surfaces. Too often today's traction systems in nanny vehicles don't.

Ford's Greg Prenette, chief engineer for plug-in and fuel-cell vehicles, says up to 120 mpg in town is reasonable in flatter, moderate driving. He forecasts 70 to 80 mpg on the highway, where the gas engine works more, and 30 miles of light driving up to 40 mph on a charged battery alone.

The prototype Toyota Prius PHEV reviewed last Friday showed 71.3 mpg on its trip computer in a downtown Detroit loop and a freeway spurt. It has twice the battery of a normal Prius, but it uses some to boost power, so it goes about 7 battery-only miles.

Escape PHEV has five times the battery and uses it all for extended range, which is how it hits 30 miles.

In search of real-world results, no special restraint was exercised driving, so results were worse than the automakers' theoretical maximums. Ford, notably, seems to have nearly erased the shudder common in hybrids when the gasoline engine joins the party. "Our engineers worked very hard on that," Prenette says.

The transition among electric-only, electric-and-gas and gas-only modes was undetectable in the test — up there with the $105,000 Lexus LS 600h L hybrid.

The Escape PHEV's battery is bigger and weighs more than the current Escape hybrid battery. Thus, there's less cargo space and slower acceleration.

Prenette says the goal is a production PHEV with the same capacity and capability as the regular hybrid.

Otherwise, the Escape PHEV was pretty much an Escape hybrid. And the hybrid seems the smoothest and most pleasant of the entire Escape line.

The prototype's brakes didn't have the feel of an anchor tossed overboard that you get from most hybrids' regenerative braking systems, which recharge the batteries as the vehicle slows. Its signature on most hybrids is a sudden scrubbing of speed when you release the throttle and more when you press the brake.

The Escape interior's been redone for 2008, an upgrade only partly successful. Some controls operate more smoothly, and the '08 is quieter. But the rear

Ford Escape SUV plug-in hybrid prototype

▸ **What is it?** Plug-in version of the Escape compact SUV gasoline-electric hybrid. Has five times as much battery capacity and hardware as the current Escape hybrid to recharge the battery from a standard household outlet.

▸ **What's the point?** Minimize fuel consumption by using battery-only power as long as possible before the gasoline engine kicks in.

▸ **How soon?** It's a prototype. If tests are positive, it could be on the market in five years.

▸ **How much?** It's unclear how much the bigger battery and charging hardware would boost the price. Today's normal Escape hybrid starts at $27,170.

▸ **What's the drivetrain?** Same as a non-plug-in Escape hybrid, but with a 10-kilowatt-hour battery vs. 2-kilowatt-hour battery. Has 2.3-liter gasoline engine rated 133 horsepower at 6,000 rpm, 124 pounds-feet of torque at 4,250 rpm, mated to an electric motor rated 94 hp, driving through continuously variable automatic transmission.

▸ **What's the rest?** Features, furnishings are similar to normal Escape hybrid, which can be found at www.fordfdirect.com.

▸ **How big?** Typical small SUV: 174.7 inches long, 71.1 inches wide (81.3 inches including mirrors), 67.7 inches tall on a 103.1-inch wheelbase. Weight is listed as 3,900 pounds, about 260 more than non-plug-in Escape hybrid. Ford expects to cut that by 45 pounds.

Prototype has slightly less cargo space than the production hybrid because the battery is bigger, but Ford says the production plug-in would have the same cargo and passenger space as a non-plug-in. Turning circle diameter is listed as 36.7 feet, curb-to-curb.

▸ **How thirsty?** Ford claims up to 120 miles per gallon in city driving, 70 to 80 mpg on the highway.

Ford says that careful drivers could stay on battery-only power up to 40 mph for the first 30 miles, using no gas oline. After that, the vehicle becomes a conventional gasoline-electric hybrid.

2008 Escape hybrid is rated 34 mpg in town, 30 mpg on the highway, 32 in combined driving (front-wheel drive) and 29/27/28 (all-wheel drive); 2009 models get a different engine, but Ford hasn't forecast mileage ratings.

The experimental trip computer wa faulty in the FWD prototype test vehicle. Ford says a separate computer in th vehicle showed 55 mpg for the test — 23 brisk, suburban miles on snow-slick wheel-spin-inviting streets.

▸ **Overall:** Smoothest hybrid drivetrain yet tested; excellent mileage. Can Ford bring it to market at the right price?

ATTACHMENT 8

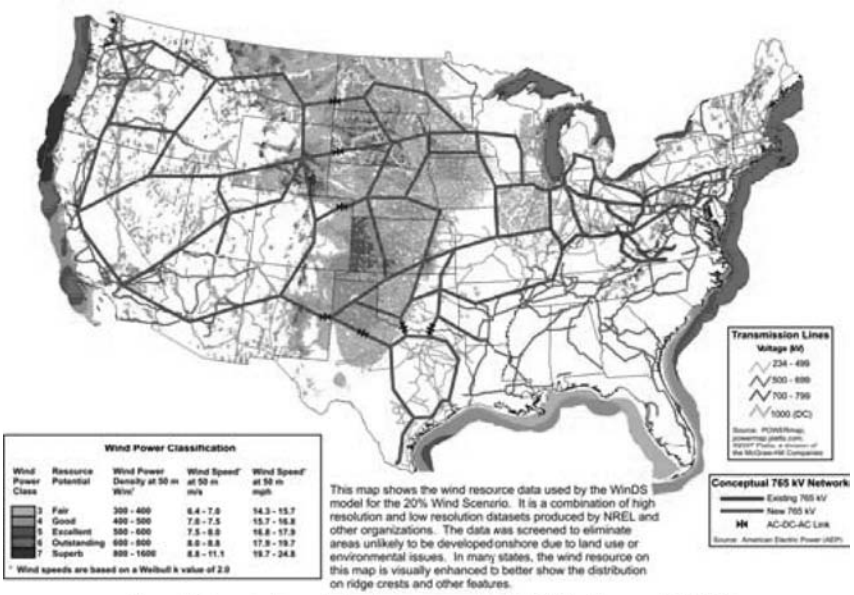


Figure 1-9. Conceptual transmission plan to accommodate 400 GW of wind energy (AEP 2007)

The CHAIRMAN. Thank you, Mr. Secretary. Your enthusiasm for what has been done in Minnesota is evident, and we enjoyed very much visiting there and seeing what you are doing at Buffalo Ridge.

Mr. NICHOLS. We were so glad when you came, Mr. Chairman. Thank you.

The CHAIRMAN. It was a very good learning experience. Mr. English, I assume that you were in the room for most of panel one and heard the gentlewoman from New York's question dealing with our colleague from Tennessee's report as well as the statement by Mr. Lucas at the end of the first panel.

I just wonder if you can elaborate on some of the accusations of non-paid dividends, elections not being held, shell corporations, and where you are on the whole process of oversight in dealing with that.

Mr. ENGLISH. Well, thank you very much, Mr. Chairman. I appreciate that. I guess my first point with regard to the capital credit's issue and that is member equity. And basically it is invested mostly in infrastructure. I think Mr. Cooper points that out. There is about $3.8 billion in cash throughout the electric cooperative system nationwide, all 47 states. What that amounts to is about 45 days operating expense for electric cooperatives, which I understand is very much within the realm of what most businesses would like to carry. Certainly one that is as resource intensive as electric cooperatives are.

So most of what Mr. Cooper is talking about is tied up in wires and lines and poles and also infrastructure. And that is the invest-

ment, of course, that the membership owns. There is no question about that.

As far as any kind of regulation, most of that is done, as you know, on the state level through public utility commissions. They normally handle that kind of duty with regard to utilities throughout the states. Different states have different laws as to how they handle that, how they deal with it. And that certainly is the case with regard to electric cooperatives. I believe, if I remember correctly, somewhere around 45 of the 47 states in which electric cooperative are located have some kind of regulation as far as those cooperatives are concerned.

The not-for-profit aspect is probably the one that is the most sensitive. That gets down to salaries, and as Members of Congress know, those are always sensitive issues when we talk about pay. And that is true at the local cooperative and certainly the expenses of Boards of Directors and the managers. Those are issues that are now going to be a public record. They had been a public record. They are going to be even more extensively covered under the new form 990 in that the Internal Revenue Service requires each cooperative to file as a not-for-profit organization, including not only what your salary is, not only what you are paid in *per diem,* but also any conflicts of interest that you might have and goes further even than the SEC requires with regard to private entities that are filed with that organization.

And certainly as the Administrator pointed out, any cooperative that borrows from the Rural Utility Service also is subject to the rules and regulations governing the loans made by the Rural Utility Service. That has been the case for many years, and it was pointed out to me that the Rural Utility Service even still today has authority, if they so wish and find it necessary, particularly if the loan is in jeopardy, to remove the manager or even to deny the hiring of a particular manager that a board may choose if they find that that person does not stand the test as far as protecting the government's investment in the loans.

And the other point that I would make, Mr. Chairman, along those lines is that we have to understand that while I know many people in this country look upon electric cooperatives—in fact, many of them call them the REAs. I have heard them mention the REAs. That is not exactly the way it happened.

The Federal Government was a lender, made it possible and certainly supported and assisted the local people who did not have electric service back in 1937 to come together to, in effect, develop their own electric utility and to have the resources necessary to build the infrastructure to provide themselves with electric power. Franklin Roosevelt made the observation at that time that electric power was no longer a luxury in this country. It was a necessity. And we think that goes to the heart of affordability, and that is what electric cooperatives have been about throughout their history. And they continue to do that today.

We do have an obligation, of course, to treat every member fairly and justly, and the bylaws of each electric cooperative are aimed at doing that; the policies of that cooperative as well.

Are there differences? Certainly that is the case. It is much like voting for school boards. We have differences among individuals.

Local politics and personalities come into play in electric cooperatives just like they do the local school board. And certainly there is a recognition and an understanding of every officer, whether they be a director or manager or staff of electric cooperatives, that it is the membership that owns that electric cooperative. And it really is theirs.

The CHAIRMAN. Thank you, Mr. English. I just wanted to give you a chance to respond to that and let you be aware that there have been some serious concerns that have been raised by our colleagues. We want you to get your hands around it and see what you can do to make sure that the integrity of the system is maintained. And I know my time has expired, but if the Subcommittee would——

Mr. ENGLISH. Could I continue just a minute on that——

The CHAIRMAN. Absolutely, Mr. English.

Mr. ENGLISH.—Mr. Chairman? There is one other point that needs to be understood here, and we all see this. I know whenever I was taking civics in high school, I studied our form of government. When I came to Washington as a Member of Congress, I didn't find that our government operated exactly the way the civics books laid it out. Whenever you have all these different personalities together, when you got people involved, it took some twists and turns, and it didn't always operate the way it should. And it didn't always operate as smoothly as it should. That is the rule with people.

And I would suggest that you have to look at the governance of electric cooperative much in the same way. These are people who are elected by the same folks that elect Members of Congress and state legislators and those same school board members. And the people that they elect to those offices all have different capabilities, and in some cases, differing degrees of integrity. And we have certainly seen that in every elected body, all the way from the highest levels of our government down to the lowest.

And you run into people from time to time that go astray, stub their toe, do some things that they probably shouldn't. But the system that we have, whether it is our system of governance or whether it is the system of governance within electric cooperatives, works. And that is what we have seen take place, certainly in Texas with Perdenales. We saw it take place with regard to the co-op down in Alabama, and we have seen numerous other instances around the country throughout the history of this program. The membership takes care of those kinds of problems.

The CHAIRMAN. Okay, Mr. English, getting back to the original purpose of the hearing. If you are restricted from borrowing from RUS because of the baseload generation problem that we are facing right now, would you be able to seek private financing? And would it be your intention to do that for coal-fired plants?

Mr. ENGLISH. Well, our members are going to do whatever they can to try to meet the requirements of our members, to try to provide them the electric power they need and try to keep those electric bills as low as they can. They are going to look at all the options that they have before them. I think there is a real question as we move forward and we anticipate, as I said, some kind of climate change legislation is going to be passing in the next year or

two. And obviously whatever is done is going to have to be done in recognition of that and dealing within those parameters.

But we are going to be taking whichever option tries to keep those electric bills as low as we possibly can. It is going to be a heck of a challenge.

What I have a greater fear of, Mr. Chairman, is whether we are going to be able to provide the amount of electric power the country is going to need. I think that there was a mention of NERC and their study that they came forward with. There is a real possibility and likelihood, in fact, that in the next 5 to 6 years we are going to see rolling blackouts in this country because of the inadequate amount of power. And, it very well could happen in areas served by electric cooperatives.

And, that is the real challenge. The country needs to come together and certainly the Congress needs to reconcile our objectives with regard to climate change with this 118 gigawatts of power that is going to be necessary in the next 10 years before we are able to have carbon capture and storage and bring coal back into, fully into play and being a major player as far as the deal.

The CHAIRMAN. But private financing is available for your members?

Mr. ENGLISH. It is. It is going to cost us more. It means electric bills are going to be higher than they would otherwise be, and quite frankly, we have a little bit of difficulty understanding this. What started out as a fiscal problem, the Office of Management and Budget, said, "Hey, we are not charging enough as far as interest on baseload generation loans. Therefore you can't do anything, make any more until we make this correction, this adjustment."

We agreed and said, "Okay, charge more on interest for baseload generation, and we will gladly pay it." That is what was contained in the farm bill and unfortunately got knocked out.

The CHAIRMAN. Thank you. Mr. Lucas.

Mr. LUCAS. Thank you, Mr. Chairman, and I certainly would be remiss, Mr. Chairman, if I didn't note coming from the great State of Oklahoma where one million of our 3½ million Oklahomans, are members, are family members, of co-op participants, literally 28 co-ops. Oklahoma is an example of the 1937 Act because, quite simply, the reason we have so many people who are co-op members and consumers of co-op electricity is we were a poor state, and nobody wanted to come there and invest the money. And had it not been for the 1937 Act, we might still be sitting in the dark, many of us.

So it has served its purpose, and I offer that as a disclaimer acknowledging the nature of my state and how successful the program has been.

These hearings, to our friends on the panel who perhaps have not participated before, are very educational in that we occasionally educate each other. You provide insights. We build the record. We move forward and make decisions based on that, and I am very pleased that the Chairman gave an opportunity to address some very interesting public comments about the nature of co-ops.

And I would note, for the record, my observations to my friend from Kansas, that certain decisions were made above and beyond the station of this Committee that very much affected the jurisdic-

tion of this Committee. And when the language that would have basically put RUS back into base generation loaning capacity, when that language was stripped out, it had a very definitive effect on our folks back home.

With that, addressing that if you would once again, Mr. English, observe if we don't give co-ops the maximum number of opportunities in which to generate new capacity to produce that capacity, repeat one more time for the record what folks out in rural areas can expect in the near future.

Mr. ENGLISH. Well, this is true, not just with regard to electric cooperatives, I think there is a real question whether the industry is going to be able to meet the demands and the need. We have been living with a surplus of generation for the last 25 years, and that has enabled us to keep electric bills low. That is not going to be the case in the future.

The best case scenario may be that we are going to have very big increases, big spikes, in electric bills much like we have seen in gasoline. We are very fearful we are going to have a large number of our members who are not going to be able to pay their electric bills, not going to be able to afford that electricity that Franklin Roosevelt was talking about being a necessity. And we are not going to be able to achieve that goal.

But certainly it is going to cost more on the electric bills in acquiring money on the open market as opposed to, obviously, money that is loaned to us through the Rural Utility Service.

Mr. LUCAS. Mr. James, if we take all these other options off the table, and I serve with a number of people who would say that conservation is the key. Let prices go high, which will drive the market in the other direction, whether it is gasoline or electricity. Let us force people to make the move. Can we conserve ourselves?

Mr. JAMES. Well, what we would say is that it is a question of the cost of producing energy or using energy in the economy. You can choose different strategies which are going to be a lot more expensive to commerce and business with a given amount of energy. Conservation, over-reliance on one technology, and I would include others including conservation in that, will generate a higher cost than a balanced portfolio.

Mr. LUCAS. So does that go back to what Mr. English is talking about? If we push the conservation or any particular area with that kind of intensity and we raise cost, there is an adverse effect on the poorer part of our society or the less economically advantaged part of our society?

Mr. JAMES. I would say electricity prices would go up.

Mr. LUCAS. Nobody wants to sweat in the summertime in Oklahoma——

Mr. JAMES. That is right.

Mr. LUCAS.—when it can get very hot. So there will be an adverse effect on those least able to pay those costs reflecting that agenda?

Mr. JAMES. Unless we try to find an optimum portfolio, reduce the impact of building new generation and meeting emissions constraints.

Mr. LUCAS. Mr. Nichols, I was very impressed with the tour that the Agriculture Committee took to Minnesota last year or year be-

fore. Very impressed. But it sounds—just very impressed. That is the best way I should leave that description.

Mr. Chairman, thank you for calling this hearing. I appreciate——

Mr. NICHOLS. Mr. Chairman, Congressman, the gentleman from Oklahoma. I had a group from Oklahoma that came to my wind farm about 10 days ago. Great independent oil producers. Great people. And I learned so much from them. First of all, 70 percent, almost 80 percent of the oil exploration in America is done by the independents. The big companies—and I have that handout here—they don't spend their money. Exxon Mobile isn't investing in exploration. They are just handing it out to their stockholders.

And these little producers, they are our future. They would like to get into wind energy because you have it in Oklahoma, as you well know, Congressman. The problem is in the oil industry, their tax credit doesn't expire every 2 years. So they are trying to figure out how to deal with this tax credit that expires every 2 years.

And when I get home, Mr. Chairman, several projects came to see me yesterday because they heard I was going to be here. We have so many projects pending. What they want to know is do you think Congress will do anything with the PTC? So I know I will be faced with that tomorrow morning, those questions. And I know it is hard for you to answer those questions with the Senate over there, but we talk about the shortage, Glenn.

It takes 1 day to build a wind turbine. You know you can build 100 megawatts in 100 days. And if you have three cranes, you can build it in 30 days.

With the REA co-ops, and I am a co-op member, when the wind is blowing you don't run the water over the dam because a lot of our power comes from the Missouri River. So the REA co-ops—and we don't ask for any loans or any of those guarantees or anything. The wind industry doesn't want any of that. All they need is some stability so we could buy the turbines in America, Mr. Chairman. And tens of thousands of megawatts could go up very, very quickly.

We need to build 500,000 wind turbines, which would be the same as the 500,000 oil wells we now have. And then we could get out of this crisis between the wind and the oil from the independent producers, biodiesel, ethanol mostly, and natural gas. We wouldn't need to import from the Arabs anymore.

Mr. LUCAS. Mr. Nichols, I wholeheartedly appreciate what you are saying and as a proponent of all forms of American energy, stability in the tax credits so the wind people could count on it, access to punching holes everywhere where it is environmentally sound and resources may be, I am a proponent of that. I am a great proponent of all renewables. I watch the no-ethanol stickers now appearing on the gas pumps in Oklahoma. Someone is pushing back on us.

But the bottom line is we need all sources of American energy to meet American needs. But we face challenges. Just as Ways and Means wants to dole out or dribble out the tax credit, just as certain people don't want us to be able to have all of the options for baseload generation, we face some internal problems here.

But as our friend, Mr. English said, it is not exactly the way the civics books implied the system would work, but it is the best sys-

tem on Earth. And all of us together will continue to work until we achieve what is in the best interest of our folks back home. Thank you, Mr. Chairman.

The CHAIRMAN. Okay, I thank the gentleman. The gentlewoman from South Dakota.

Ms. HERSETH SANDLIN. Thank you, Mr. Chairman. Mr. Nichols, I am a neighbor of yours if not——

Mr. NICHOLS. I know your father. I have never met you, and glad to now say hi to you, your father is a great guy.

Ms. HERSETH SANDLIN. Thank you. He has shared with me some of what you have been doing and the potential that has for my constituents in South Dakota. And I agree with you that the Midwest, including South Dakota, Minnesota, other states, has an important role to play in developing wind energy to serve the nation's needs.

And I also appreciate what you have to say about how we have structured the production tax credit. Not just our inability for the multi-year extensions, but how we have structured it to benefit larger developers rather than the community-based energy development that you have been able to facilitate across the border in Minnesota more effectively than we have.

You know today I am introducing legislation that you may be aware of with my colleague, Mr. Fortenberry, who is also a Member of this Committee. He is from Nebraska. That is intended to support community wind generation similar to the 1½ megawatt turbine on your property, and it would target projects in the range of 5 to 20 megawatts. The bill would prevent the so-called production tax credit haircut that you are probably familiar with, in which under current PTC rules, the value of the farm bill REAP Grant can be reduced by as much as 50 percent when local farmers and cooperate partners join together on these projects.

And the haircut reduces the capital investment then for local producers and what they can bring to the project and lowers the value of the PTC to the corporate investor and delays the time at which the ownership flips back. In the case that I know that many folks in Minnesota have been able to flip that ownership back to the local owner.

On the question of transmission, however, I mean there is a reason that Minnesota, which, in all due respect, does not have the same potential wind resource that we have in South Dakota. You have good wind. We have great wind. There is a reason——

Mr. NICHOLS. You do. That is correct.

Ms. HERSETH SANDLIN.—you are far ahead of us in developing wind, and that is the issue of transmission. So I am interested in hearing your thoughts on how we can enhance the transmission capacity to transport all of this clean, renewable energy resource to other parts of the country.

Mr. NICHOLS. Thank you, Congresswoman, and first of all, for the rest of the Members, I brought this, and thank you for this. The projects that are stalemated in South Dakota because of the PTC, and I am right on the border. So some of the people who will come to see me tomorrow are going to be South Dakota people, and I appreciate what are you trying to do there. And you have worked hard on that.

The transmission issue, we built a lot of transmission in Minnesota, but the map here, it is a color map, and you are familiar with that. If Congress would just move forward with the Department of Energy plan for 20 percent by 2030, that is all you have to do.

Now, we can't quite do it as a state, and the beauty of this—and I have spent most of my life in South Dakota. You got a great wind resource. You don't have many people there. Your market is not in South Dakota for your wind. Your market is in Los Angeles is the first big market that desperately needs it. And this is crop that you can grow in South Dakota and deliver instantly to your customers in Los Angeles.

These transmission lines are not expensive. They are, I mean relatively compared to a road, much cheaper. And they are a farm-to-market road. And people say we don't have a corridor. And what kind of baloney is that? Every road ditch is a corridor. We have hundreds and thousands of miles of road ditches, and that is where we build. So we have the corridors. You just need to move forward with this transmission plan.

And great engineers from all the utilities put it together. This is designed, and it will work, and it will deliver the power from where the wind is, the Midwest, your state, to the customers that need it around the nation.

Ms. HERSETH SANDLIN. Just a quick follow-up question. In your opinion, do you think that to get Department of Energy's plan with the transmission map that they have laid out——

Mr. NICHOLS. Yes.

Ms. HERSETH SANDLIN. Do you think that needs to be an investment of, the estimates are about $70 billion that Congress makes directly? Or do you think that there will be enough money in the private market to meet that need and to build it on the timeframe that we need to have it? Or do you think it needs to be a public-private approach?

Mr. NICHOLS. I think it needs to be public-private in this respect, and you have already done that in so many ways. You have just bailed out the Fannie Maes and the Freddie Macs. Loan guarantees would move this thing forward just immediately. The problem is the utilities, we don't reach across state lines, as you well know, Congresswoman. So it is very hard to do it state by state because how do we in Minnesota, how do you in South Dakota figure out a way to get your power to Los Angeles where they really need it?

So loan guarantees would immediately solve that problem, and that would be my plea to you on that. It will be paid for with a user fee because the power is produced so cheaply on your farms in South Dakota. You know it is 14¢ a kilowatt hour in Los Angeles for electricity. I am producing it on my farm for 3.3¢.

You know there is a market out there. We just got to get it there. Now, I am lucky in Minnesota because we have created our market with our own state mandate which is 25 percent. But in your state, even if you had a mandate, you don't have enough people.

Ms. HERSETH SANDLIN. That is why we have at-large members in South Dakota and North Dakota. Thank you, Mr. Nichols.

Mr. NICHOLS. Thank you.

Ms. HERSETH SANDLIN. Just a quick question for Congressman English. You focused on the need to assist low-income individuals in part of your testimony with energy efficiency efforts. And my understanding of that is 90 percent of the cooperative members are residential accounts, and that totals nearly 60 percent of co-op electricity sales. So obviously there is a large potential here as it relates to efficiency savings to be found.

Now, one of the leading co-op efficiency efforts has been the installation of advanced metering infrastructure to improve load monitoring and control. And as you know, a Congressionally-directed Federal Energy Regulatory Commission staff report in 2006 concluded that rural electric cooperatives showed the highest rate of market penetration of advanced metering at nearly 13 percent, double the overall national rate.

Two questions: To what do you attribute the higher rate for rural electric co-ops? And what are the key steps to increase the installation of AMI nationwide?

Mr. ENGLISH. The first thing would be because we are owned by our members, and that is where our focus is, and that is where our concern is. It is those electric bills that we are trying to deal with.

The second one comes down to the issue that basically this has to be a national commitment. It has to be a recognition, an understanding, a determination by, quite frankly, the United States Government that we are not going to go backwards. That we are, in fact, going to make certain that the observation made by Franklin Roosevelt in 1936 continues into the future. That we are not willing to let our citizens, a large portion of our citizens, be without what we regard as a necessity in this country and downgrade the quality of life and standard of living for our citizens. I think this is a fundamental principle, and if we are not careful, I am afraid we are going to step back into that reality without really making any kind of decision that that is where we wanted to go.

And if I could add very, very quickly, the one thing is not going to be financing in my opinion with regard to the transmission line, and I think that Secretary Nichols and I agree on this. We need it. It is going to be sited, and there is going to be a lot of political—the political price is going to be far greater, quite frankly, than what it is going to take to build it. But that is what we are going to have to do.

Ms. HERSETH SANDLIN. I appreciate you making that point, and I thank the Chairman for the additional time. As you know, that additional but limited authority we gave FERC in 2005 has been under assault repeatedly, and we need not only to retain that authority, but to enhance it, if we are going to effectively site the corridors. Yes, in certain parts of the country they may already be there, but we already know from certain pushback that we are getting, certain areas of what DOE has identified in that map may be problematic if we don't have the authority that FERC needs to do so, understanding that states and local communities and tribes need to be consulted and have a say. But the authority needs to be there to move forward; otherwise, the timetable will be slowed down dramatically. Thank you.

The CHAIRMAN. Thank you. The gentleman from Kansas.

Mr. MORAN. Mr. Chairman, thank you. I appreciate the panel's testimony. It's been an interesting morning. I am fearful that we are headed down the path. We are spending a lot of time here in Congress today and weeks to come and weeks in the past on the cost of energy, as our constituents visit with us, in almost every conversation about the price of fuel at the pump.

And it appears to me, based upon your testimony, but what I just intuitively know, what common sense tells me, is that we are in the process of creating similar circumstances for our customers of electricity. My fear is that, as we have done in gasoline, in the price of diesel, in the fears and concerns and consequences that we have today in our energy costs, that we waited too long to address the issue. And we are playing catch up as we try to solve this problem.

I would love to be assured by any or all of you that there is some effort, industry-wide, government officials, the Department of Energy, that someone has a plan. The Congressman indicates that we may want to involve the Federal Government in nuclear power, and it does appear to me that probably almost no companies are capable of investing the resources necessary to build a nuclear power plant. But is there some place within the Federal Government, within the industry, that we are actually planning to meet this country's future needs for electricity?

Mr. NICHOLS. Can I——

Mr. MORAN. Yes, sir, Mr. Nichols.

Mr. NICHOLS. Mr. Chairman, I was in your state many times. I was the manager of your wind farms when I worked for Vestas, the largest wind company in the world. You have a great wind resource, and I know that the power purchase price from those wind turbines was very low.

So when they talk about—and we all hear the same thing—the price of gas. When they talk about what is going to happen to energy, wind energy is cheap energy, and you have a lot of it. And the cost of a turbine, it is all debt service. You know, the rest of it is—the wind is free, and there isn't much maintenance.

If we could build these in Kansas so we could buy them in American dollars, and if we could get some competition into this, we get the price of these turbines back to where they always were, which was $1 a watt, $1 million a megawatt. And that is what the Garden City, Montezuma, and all those down there, I was part of that. That was very low-cost energy for the consumers, and we need to move forward with the plug-in hybrids, Mr. Chairman.

And we need more oil exploration. We need to find more in America. It is in Kansas, and it is in Texas and Oklahoma. And the little oil producers can do that. We are going to need nuclear power. Let us admit that.

We are going to need every source of power that we can get, but we need to get away from importing the oil from the Arabs that are going to jack up the price to $200 a barrel. They have told us what they are going to do. We know what they are going to do to us. And we need to produce it on our own, and so the plan again, the Department of Energy plan, is 20 percent by 2030. It is right there.

Mr. MORAN. Mr. Secretary, I understand what you just said and believe what you just said. I recognize the importance of wind in Kansas and across the country. I am pleased that we have the industry that we do. It is growing. Facilities that you are talking about have contemplated expansion.

Mr. NICHOLS. Yes, they are.

Mr. MORAN. And in addition to that, we have a couple companies that are seriously looking at locations in Kansas to build turbines. That would be, based upon what you suggest, would be a wonderful development.

Mr. NICHOLS. Yes.

Mr. MORAN. My question is it just seems to me that we are—there is no clear direction. There is no plan. There is no strategy. We simply respond hodge-podge. I don't know how a utility company could make a decision about investing in wind based upon the inability for Congress, for example, to pass a tax credit encouraging that development. And if we do pass one, pass it with such short timeframe that no business can make an intelligent decision about what the future holds.

Mr. NICHOLS. Two years is worthless.

Mr. MORAN. And so I guess the point I would make perhaps just rhetorically, because my time is about to expire, is that I am fearful that the Department of Energy, Congress, the administrative branch, the Legislative Branch of Congress, and perhaps the industry itself needs to respond with—this is the challenge.

And I think it is important for you all—Mr. English's comments about the demands and what they mean for consumers. I think that is an important story to tell. There is a belief that electricity prices, if they go up, it is like the comment that I read in the paper, doubling energy prices in Kansas is a wonderful thing. Well, I represent lots of Kansans who struggle today certainly to pay their gas bill, their electric bill, their grocery bill, their doctor bill. Doubling energy prices is not a good thing for many people who struggle today and will struggle even more.

And so the story about the demand, the growing demand for energy, is one that has to be told. But I also think that once the story is known, once the facts are there, I would love to see a more serious and concerted effort, a much more aggressive approach to the idea of filling that demand in an environmentally sound manner.

And I would support conservation. It is a combination of things that we all can come together, and yet in the circumstances we find ourselves in, we are headed down the same path of responding too late to meet our country's needs.

The gentlewoman from South Dakota is not in the room, but I am interested in her legislation. I would encourage her to visit with me about it. Because wind energy is an opportunity not just for the large production facilities that you mentioned in your comments, Mr. Nichols, but for communities, community colleges, businesses, families, to decide this is an opportunity for us to help meet our own and therefore the country's energy needs. Thank you, Mr. Chairman.

Mr. JAMES. Mr. Chairman, may I offer a——

The CHAIRMAN. Yes.

Mr. JAMES.—add a comment on his question?

The CHAIRMAN. Sure.

Mr. JAMES. What I would just like to say is that the industry certainly has been trying to develop a coherent technology strategy based on which it can move forward and minimize electricity costs, the growth and costs and we go forward. And the thing I would just ask the Committee to consider is that one option is always looking for cheaper technologies, looking for a technology that exists today that can generate electricity in cheaper costs.

The other option is improving technology so you can reduce the cost of promising technologies so they can produce cheaply. That we work together to develop a portfolio of technologies and a development plan with research and demonstration projects to develop those technologies. And we are working with essentially the entire industry on those technologies and have been now for several years.

Mr. MORAN. Mr. Chairman, may I briefly respond? Just a thought, and I don't know a lot about this topic, but I do know that the land-grant universities have had a tremendous impact upon the efficiencies of agriculture in this country. And what you suggest, Mr. James, is very appealing to me. There may be great opportunity with government-private partnerships to advance research that moves us in the direction of greater efficiencies, higher technology, and less consumption. Thank you, Mr. Chairman.

The CHAIRMAN. The chair thanks the gentleman.

Mr. NICHOLS. Mr. Chairman, can I just say one thing about the cost, Congressman, because the great thing about electricity it is a regulated industry. I don't have to worry in Minnesota if I have a plug-in hybrid, when I plug it in that Xcel Energy or the REAs or any of them are going to jack up the rates. They can't.

You know most of these haven't had a rate increase in 10 and 20 years. And the great thing about that is if the cost of the turbine is too high, Xcel Energy won't sign a contract, and rightly so. They just say our consumers can't pay this, nor should they. We got to drive the cost down with American manufacturing.

So the fact that it is regulated solves a lot of those problems. You don't have to worry about that price, and that is not something Congress has to worry about. The states have to control that. All you have to do is adopt the plan of the Department of Energy and make it the law. It is going to be 20 percent by 2030. That is the law, and we are going to build this transmission system, and we are going to have a tax credit that goes more than 2 years. And that is all you got to do.

The CHAIRMAN. Well, thank you, Mr. Secretary.

Mr. NICHOLS. It is simple. Thank you very much.

The CHAIRMAN. Thank you, Mr. Secretary. Mr. James, what is the biggest impediment to carbon sequestration?

Mr. JAMES. Well, okay, carbon sequestration is the storage of carbon. Technically I would say the biggest impediment is demonstration at large scale. We have experience in storing carbon at smaller scales, enhanced oil and gas recovery. Although those projects are not really designed to store carbon for long periods of time. We know what it is like to inject into the ground.

What we haven't done is had experience with injecting and storing and monitoring over a long period of time millions of tons of

CO_2, which is the scale of CO_2 you would expect from an ordinary coal plant, for example. So demonstrations of these projects at large scale is what is needed.

The CHAIRMAN. You know it is hard to imagine that we could put a man on the Moon 8 years after President Kennedy said we are going to, and then people are talking about 20 to 25 years before we have the ability to store carbon in large quantities. It is hard to understand.

Mr. JAMES. Well, I——

Mr. CHAMPAGNE. Mr. Chairman, if I could add something to that. In the Future Generation Alliance, and PPL was part of that, was the effort that started by this Administration, supported by the Congress to really demonstrate on a large commercial scale. We were going to sequester over a million tons a year for a long period of time.

And the industry was really looking at that project as kind of the milestone to say does this work on a commercial scale. It was going to integrate many technologies that are going to be necessary to demonstrate it.

In addition to the technical issues that Mr. James recognized, there are other issues that are needing to be addressed. One of the biggest ones is how you deal with the liability issues of putting that amount of carbon dioxide underground. You know, people may think it is an inert gas, but it is not. And you really have to look at what will you do to ensure that companies will want to make that kind of investment to deal with the fact that that stuff is going to have to be there, essentially, forever.

The CHAIRMAN. Mr. Champagne, I did not forget about you, and I should know the answer to this question. But does Pennsylvania have a renewable portfolio standard in place?

Mr. CHAMPAGNE. Yes, there is a standard in the Commonwealth of Pennsylvania, and we are participating in that. It has several tiers. It supports not only the traditional renewables like wind, solar, biomass, and landfill gas. But they are also looking at waste, coal technologies, and hydro and other demand-side response.

The CHAIRMAN. How is the implementation of that moving?

Mr. CHAMPAGNE. I think it is moving forward very well. I think you are seeing the technology starting to come. There has been a significant amount of wind energy in the state. There has also been a biomass and landfill gas push, and we are actively participating in it. And I think it is a good program.

The CHAIRMAN. In your written testimony, you talk about your plans at Berwick for your nuclear expansion. Can you just elaborate on how that is proceeding as well?

Mr. CHAMPAGNE. Yes, we have roughly a 2,500 megawatt two unit facility at the Berwick site. We are looking to put a third unit in the vicinity of that site. We are in the process of preparing the combined operating application. We have joined with the UniStar Nuclear Consortium, which is made up of Constellation Energy out of Baltimore and the big French utility, EDF. And we are very encouraged by what we have seen so far in terms of moving forward on that with the NRC.

I think one of the things that we are very concerned about is the level of loan guarantees. The Congress has appropriated $18.5 bil-

lion worth of loan guarantees. We think that is sufficient for maybe one or two, maybe three at most, units to be built in the country. So if there is going to be a nuclear renaissance, loan guarantees are going to be very important in seeing that renaissance happen, we are going to need additional support for that loan guarantee program.

The CHAIRMAN. Well, the chair thanks the panel for their testimony and for the cooperation with the question-and-answer session that we had. I think it has been very, very productive and informing.

Under the rules of the Committee, the record of today's hearing will remain open for 10 days to receive additional material and supplementary written responses from witnesses to any question posed by a Member of the panel. This hearing of the Subcommittee on Conservation, Credit, Energy, and Research is adjourned.

[Whereupon, at 12:30 p.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED QUESTIONS

Response from Hon. James M. "Jim" Andrew, Administrator, Rural Development Utilities Programs, U.S. Department of Agriculture, Washington, D.C.

Question 1. Can you explain your regulatory responsibility over rural cooperatives? What is the difference between your role and the role of FERC?

Answer. Rural Electric Cooperatives are self-regulating and as long as they are borrowing from us they, with minor exceptions, are exempt from FERC regulation. Cooperatives are owned by their member/consumers who elect a Board of Directors that govern their activities. USDA is a lender and as long as the cooperatives are complying with their mortgage and loan contract requirements, USDA only monitors financial soundness, periodic reviews of operations and management and compliance with other Federal statutes.

In reviewing loan applications USDA does review and approve long range financial forecasts, load forecast (demand for electricity) and the engineering plans and specifications, but does not serve as a regulatory body.

Question 2. Can you please describe the electric portfolio at USDA? What kind of loans and guarantees do you provide? Are cooperatives your only customers?

Answer. The outstanding loan portfolio is over $35 billion, composed primarily of loans to distribution and generation and transmission cooperatives. We have also made a few loans to municipally owned utility systems, Native American Tribes, and U.S. territories over the years and recently have begun to finance renewable energy applications from private developers. Applications from private developers will necessitate evaluation of the subsidy rate to determine if the financial risk is materially different than financing similar cooperative sponsored projects.

Question 3. How many rural cooperatives currently borrow from RUS? Are you starting to see a trend toward rural cooperatives going to private financing instead of RUS? If so, why?

Answer. We have about 617 active distribution borrowers and 57 generation and transmission borrowers. We are seeing some distribution borrowers that bought out of the program in the 1990s return to the program and more are discussing returning. Some Generation and Transmission borrowers, those with ratings, have accessed private capital for a number of years for a portion of their needs and more are considering that route due to the fact that financing of baseload generations is not currently available through the Electric Program. One Generation and Transmission Cooperative bought out of the program last year joining a few others that had previously bought out of the program.

USDA has had periods in which there were insufficient funds to meet the demand for loan funds resulting in 2 years or longer before applications could be funded. That is one reason some borrowers left the program. Presently, the inability to finance baseload generation is the reason the generation and transmission cooperatives are looking to commercial capital to finance their needs.

Question 4. The "once a borrower, always a borrower" has come under fire due to some bad actors in the system. How does RUS follow up with a borrower to make sure the facility stays in compliance with regulation, and does not become a bad actor?

Answer. We employ General Field Representatives that visit the borrowers frequently to assist with applications, construction work plans load forecasts, and long range financial forecasts, and to conduct operational and management reviews. We also require annual audits of financial statements and periodically conduct loan fund reviews to ensure the funds borrowed are used for approved purposes. Additionally, borrowers are required to submit independent annual audits of financial operations. Further, we conduct annual financial analyses to determine if borrowers may be in technical default, and if so, we work with the borrower to develop a corrective action plan. None of the recently publicized "bad actor" co-ops are Electric Program Borrowers.

Question 5. What stipulations come with being a RUS borrower? For example, what regulations must a customer follow?

Answer. USDA has a very comprehensive set of regulations designed to protect loan security. But, the compelling piece is the mortgage which provides that the Agency has first lien on all of the borrower's assets, including assets that may be required in the future. Additionally, borrowers cannot dispose of assets without our approval. USDA approves all contracts for construction and monitors the expenditure of all loan funds and to some extent the use of general funds.

Question 6. You mention renewable portfolio standards (RPS) in your testimony, and that 26 states including the District of Columbia have RPS standards. Are

these standards fairly similar or are there big differences in state law and implementation?

Answer. There is some commonality among the standards, but there are differences in terms of the percentage of demand requirement and the effective date.

State Renewable Portfolio Standards

State	Requirement	Effective Year
Arizona	15%	2025
California	20%	2010
Colorado	20%	2020
Connecticut	23%	2020
District of Columbia	11%	2022
Delaware	20%	2019
Hawaii	20%	2020
Iowa	105 megawatts	
Illinois	25%	2025
Massachusetts	4%	2009
Maryland	9.5%	2022
Maine	10%	2017
Minnesota	25%	2025
Missouri *	11%	2020
Montana	15%	2015
New Hampshire	16%	2025
New Jersey	22.5%	2021
New Mexico	20%	2020
Nevada	20%	2015
New York	24%	2013
North Carolina **	12.5%	2021
Oregon	25%	2025
Pennsylvania	18%	2020
Rhode Island	15%	2020
Texas	5,580 megawatts	2015
Utah *	20%	2025
Vermont *	10%	2013
Washington	15%	2020
Wisconsin	10%	2015

* Missouri, Virginia and Vermont have set voluntary goals with binding targets.
** North Carolina has specific targets for wind and biomass within the Standard.

Question 7. Can you please provide a breakdown of baseload generation loans made over the past 10 years? When, where, and to whom were these loans made?

Answer. See the Table below:

Borrower	Approval Date	Amount for Generation	Capacity in Mega Watts	Comments
East Kentucky Power Cooperative	09/23/2003	$413,753,000	268	Gilbert Plant
East Texas Electric Cooperative	06/17/2004	$79,403,000	182	Ownership in three Entergy units
Cornbelt Electric Cooperative	08/12/2004	$65,395,000	42	5.6% of Council Bluff Plant
Central Iowa Power Cooperative	08/12/2004	$89,923,000	60	8.0% of Council Bluff Plant
Dairyland Power Cooperative	09/07/2005	$280,000,000	150	30% of Westin Plant #4
East Kentucky Power Cooperative	02/23/2006	$481,388,000	278	Spurlock #4 Plant

Question 8. On average, how long does it take to build a new generation plant?

Answer. Assuming you are referring to baseload generation, it can take 8 to 12 years for planning, permitting and construction. The construction phase of a new baseload plant can take 4 years. This is true of projects developed by Investor Owned Utilities (IOUs) as well.

Question 9. What do you see as the role of the RUS in the next decade and beyond? Are rural areas growing in their use of electric power?

Answer. I see the primary role as continuing to meet the financing needs of the rural electric cooperatives. Rural areas, just like the rest of the country, are experiencing increasing demand for electricity and they are dependent on the financing available through USDA Rural Development to enable them to provide safe, reliable

and affordable electricity. We will continue to provide the same services we have been providing for decades, plus assisting in more renewable energy projects as well as energy efficiency and demand side management.

In addition, as mentioned in my written statement, we are also planning to assist Basin Electric Cooperative in North Dakota in adding CO_2 capture technology to an existing coal fired plant. This particular technology has, on a small scale, demonstrated a 90% capture of CO_2. Our objective is to further the implementation of clean coal technologies. We will also continue to examine other opportunities to further this and other clean coal technologies.

Question 10. No one disputes the role of the REA in energizing rural America. With some 95 percent of the nation having access to electric power, where do you see the need for the Agency exists?

Answer. There are several needs: (1) financing the replacement of aging infrastructure, some of the infrastructure has been in place for over 50 years and we view this as a high risk; (2) financing the renewable energy resources the cooperatives and other developers are engaged in; (3) financing the transmission infrastructure needed to move renewable energy to the grid; (4) continuing to finance improvements to existing generation systems, environmental controls, and peaking and intermediate generation facilities, and financing energy efficiency and demand side management in efforts to reduce the need for new generation plants; and (5) resumption of financing baseload generation plants.

Rural electric cooperatives are committed to the goal of reducing greenhouse gas emissions from existing and new generation facilities and Rural Development is equally committed to assisting generation cooperatives meet these challenges.

Electric Cooperatives are still rural, averaging seven customers per mile of line. They also serve 90 percent residential member/owners with low load factors. For both reasons, they depend on low interest, long term financing to be financially feasible.

Question 11. In the Food, Conservation and Energy Act of 2008, Congress directed USDA to do a study on rural electric power generation. What is the progress of that study and when do you expect to be able to deliver it to the Committee.

Answer. The report was delivered to the House and Senate Committees on August 25th, 2008.

Question 12. What is the breakdown of fuel feedstock for electric generation for electric cooperatives? Can you tell us how this compares with national figures?

Answer. Rural Electric Generation and Transmission Cooperatives own 160 generating units totaling 38,604 MegaWatts of generation capacity of which roughly 59% is from coal fired steam plants. About 6% represents partial ownership in nuclear plants and about 32% is primarily gas fired peaking or intermediate units. In the rest of the industry coal provides about 49%, natural gas 20%, Nuclear about 20% Hydro about 7% and other renewables about 2%.

Question 13. A corresponding aspect to generation is the transmission of electric power. Has RUS done any analysis of the transmission demands? If this is a pending study, when can we expect for it to be finished?

Answer. We have developed an analysis of regional transmission needs. We are in the process of final evaluation of the recommendations within the Department and will soon be discussing the findings with DOE, FERC and other Federal agencies later this Fall.

Question 14. What is RUS doing in the area of renewable electric power? Do you encourage "green power" and if so, how? What are the limitations for developing more renewable power?

Answer. We have had an administrative policy since 2001 of setting aside $200 million annually for renewable energy projects and offered priority processing of renewable applications. We have made about $140 million in loans for renewable projects and are now facing a potential demand of well over $1 billion.

The most significant limitation today is the lack of transmission capacity to move renewable energy to the grid and the lack of capacity on the grid. Some projects have also been slow to materialize due to the uncertainty of the Production Tax Credit.

Question 15. What are the major differences between building a renewable facility *versus* one with traditional feedstocks? Are there any special considerations? If so, what are they?

Answer. One major difference would be that some renewable projects are new technologies, which means that we must satisfy ourselves that the technology will perform as advertised and at the cost advertised. Wind is a proven technology and we have little concern with the technology, but we have to be very sure the wind

regime will support the investment and transmission capacity sufficient to distribute this output. With regard to other technologies such as using waste wood as the fuel, we need to ascertain that there is a dependable source of the fuel to support a long term investment. Otherwise the process is essentially the same. Some applicants are not our traditional borrowers which require the staff to do a comprehensive analysis on the structure and content of these applications.

Question 16. What has been you program level and budget authority over the past several years? How can you provide the program level with low budget authority?

Answer. The program level for the last few years has ranged between just under $4 billion to over $6 billion. The budget authority has been negligible due to negative subsidy rates. The subsidy rate reflects the risk of providing this type of financing, interest rate differentials and other factors. The Electric Program currently has a portfolio of over $35 billion with a delinquency rate of less than 1/10 of one percent. At the present time we have funding only for the hardship program and the Federal Financing Bank (FFB) program. The budget authority for the hardship program is $120,000 supporting a program level of $100 million. The FFB program, for loan purposes other than baseload generation, has a negative subsidy rate requiring no budget authority.

Electric Program Funding Levels and Subsidy Rates

Dollars in Millions

Fiscal Year	2004	2005	2006	2007	2008
Actual Obligations	$3,831,803	$4,319,115	$5,389,764	$3,889,767	$6,600,000
Subsidy Rate by Program					
Hardship	−2.33	3.04	0.92	2.14	0.12
Municipal	−2.42	1.35	5.05	1.51	4.20
Treasury	−0.06	−0.06	0.01	0.01	1.15
FFB	−1.99	−2.23	−0.48	−1.19	−0.70
FFB, Generation	N/A	N/A	N/A	2.11	1.92

Question 17. What is the current delinquency rate among RUS borrowers? How does this compare to years past?

Answer. The current portfolio is over $35 billion. Of that amount, the accounts 30 days overdue are about .002 percent and the accounts 60 days overdue are negligible. This has been a very consistent pattern for the last several years.

Question 18. What is your current number of employees? How does this compare to levels 10 and 20 years ago? What is not getting done today that could be done with more employees?

Answer. The Electric program has an authorized staffing level of 136 full time equivalents. Currently about 120 of those positions are filled. Twenty years ago there were 350 full time equivalents in the Electric Program. Much of this difference in employment has been offset by advances in technology. We do not anticipate a need for additional personnel.

Question 19. You mention the plant in North Dakota is in the process of installing carbon capture technology at an existing coal fired plant. Is this the first of its kind? Have there been any problems or issues with this plant? When do you it will be online.

Answer. I should clarify that Basin is evaluating the technology for use in the plant in North Dakota and will be installing it later. The technology was tested positively at a much smaller scale at a plant in Ohio. Basin is now taking the technology to a higher level. I believe the target date for being online is 2012.

Response from Cynthia A. Marlette, General Counsel, Federal Energy Regulatory Commission, Washington, D.C.

Question. Do you know what the annual percentage growth is of electricity use in the U.S.?

Answer. I'm not sure whether the Congressman meant "growth in electricity use" or "growth of electricity production in the U.S." but here is what we put together. We will be happy to put our response in a formal letter to the Chairman. Please let me know.

> Total retail sales of electricity increased 2.1% between 2006 and 2007 based on Energy Information Administration (EIA) data.

Total electric generation output increased 2.8% between 2006 and 2007 based on Edison Electric Institute (EEI) data.

The difference in the growth rates is due to the fact that we're using EIA for sales and EEI for production.

These numbers may be misleading since both annual sales and output depend on weather. To give you an idea how both use and production have grown since the turn of the century:

Total retail sales of electricity increased on average 1.4% per year between 2000 and 2007 based on Energy Information Administration data.

Total electric generation output increased on average 1.8% per year between 2000 and 2007 based on Edison Electric Institute data.

The annual sales and output statistics are provided below.

EIA Electric Power Monthly—June 2008 Edition

(Million Kilowatthours)

	Total Retail Sales	Through March	Growth Rate
2000	3,421,414		
2001	3,394,458		−0.8%
2002	3,465,466		2.1%
2003	3,493,734		0.8%
2004	3,547,479		1.5%
2005	3,660,969		3.2%
2006	3,669,919		0.2%
2007	3,748,149	905,503	2.1%
2008		929,506	2.7%

Average annual growth rate 2000 to 2007: 1.4%

Edison Electric Institute Weekly Electric Output Report

(Million Kilowatthours)

	Total Generation Output	Through 8/2/2008	Growth Rate
2000	3,639,827		
2001	3,620,004		−0.5%
2002	3,753,765		3.7%
2003	3,770,332		0.4%
2004	3,853,410		2.2%
2005	3,994,971		3.7%
2006	3,988,870		−0.2%
2007	4,100,610	2,411,478	2.8%
2008		2,428,993	0.7%

Average annual growth rate 2000 to 2007: 1.8%

Thanks.

CAROL E. CONNORS,
Congressional and Intergovernmental Affairs, Federal Energy Regulatory Commission.

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