

# Gellici Describes Groundbreaking Study

**C**oal News: Janet, we certainly appreciate you talking to readers of Coal News as we celebrate our 10th Anniversary. I've had the pleasure of knowing you for awhile, but our readers would be very interested in your background and how you came to be Executive Vice President and COO of the National Coal Council.

**Janet Gellici:** Thank you for the opportunity, Bill, and congratulations on the 10th Anniversary. It's quite an accomplishment on your part to be able to continue to do what you've done for 10 years now, and it seems like just yesterday that you started. We have known each other for a while and I have actually been in the coal business for 35 years or so. I started out working for the Western Governors' Association in Denver, Colorado. We did a multi-national study on the export of coal off the West coast of the United States and Canada. A multi-

national study was conducted and we kind of grew an organization out of that called the Western Coal Export Council. I started working for the Western Coal Export Council which over the years merged into the Western Coal Council and eventually the American Coal Council. That grew from being focused on coal sales and transportation to domestic and export use over the years. I was with them for 30 years having quite a run with them and enjoyed my time. I took over as Executive Vice President and Chief Operating Officer of the National Coal Council in May of 2013. I had a very short honeymoon period because I had been appointed to the National Coal Council as a member in 1998, so I knew about the workings and operation of the council and served on the Executive Committee for a number of years. So they gave me a real short honeymoon period to kind of get things going and it has

been a year already!

**Coal News:** It is. Well tell us please about the history of the council, its function, and its membership.

**Janet Gellici:** The Council is happy to be celebrating our 30th Anniversary this year. We just had a 30th Anniversary celebration in May with our Spring Meeting in Washington, D.C. It was in 1984 that Secretary Don Hodel established the National Coal Council. He did so in the belief that our most abundant fossil fuel, which is coal, should have the same voice within the federal government as the petroleum industry had had for about four decades. Our counterpart, the National Petroleum Council, had been established during World War II in response to some of the needs of the war effort at the time as an advisory group to the President. So we established the National Coal Council. Jim McAvoy was the first Executive Director of the NCC starting

the group from scratch and did a great job in forming the organization giving it some prominence immediately out of the gate. So, we are now established under what's called the Federal Advisory Committee Act or FACA, and we are an advisory group to the Secretary of Energy. We provide him with council and advice on general policies related to coal as well as technology and issues related to coal and its uses. Our principle activity for the year is mostly in the form of providing the Secretary with a Study. We prepare a comprehensive detailed written Study for the Secretary. We've prepared over 30 of those in the last 30 years.

**Coal News:** I understand you have a new study, Janet. Tell us about the new study.

**Janet Gellici:** I'm very excited about that. It's actually the first one under my tenure as Chief Operating Officer and is entitled *Reliable and Resilient:*

**The Value of Our Existing Coal Fleet.** We were asked by the Secretary to provide an assessment of measures that would improve the reliability, efficiency and the capacity of the existing coal fleet. It's particularly important now because we are anticipating regulations from the Environmental Protection Agency to be coming out in the next week or so about addressing greenhouse gas emissions from the existing fleet and we felt this would be a very important piece of information, as I'm sure the Secretary did, to contribute to the dialogue that we will have in the coming months on what we should do with our existing coal fleet and how best to use the existing assets that we have in an increasingly clean manner. We think this is a critical piece of information that can be used not just by the Secretary but by other members in the public policy arena.

**Coal News:** Well getting into the study

a little bit, I know it refers to the Polar Vortex Janet, tell us of the significance of that please.

**Janet Gellici:** Sure, we conducted the Study during the winter of 2013 and 2014, and started this back in December of 2013. We completed the study in a record amount of time by the 14th of May when it was approved by our members. If you recall, it was during the period of time that we had pretty severe cold weather events, a lot of which is referred to as the Polar Vortex. So our study was under way at the same time and it really reinforced the importance of maintaining the coal generation fleet. What we found is that coal was the leading source of power during this period of time. There were a lot of coal units that have been earmarked for shutdown in 2015 and 2016 in response to regulations and market conditions such as inexpensive natural gas. But what we found, during this cold spell period, was that the utilities that were planning to shut down these units were running at a level at anywhere from 75 to 90 percent of units that were earmarked to be shut down in 2015/16 in order to meet the power demands that were occurring during this cold spell. So there was a greater demand for power in 2014, but actually natural gas generation decreased during this period of time as primarily natural gas was diverted to fuel residential heating needs. Natural gas prices soared to over three times that of coal, so really without those coal plants that are slated to go offline in a couple years, many of the regions would not have met the demand for power. So absolutely, reliability and affordability are at risk and this reinforces our bottom line that these are valuable assets that we need to maintain and we need to take a second look at what we are doing in terms of bringing these assets offline.

**Coal News:** I know the study describes the benefits of the existing coal fleet. What are some of these benefits?

**Janet Gellici:** As part of the study we took a look at the role and benefits of the existing fleet. America has 310 gigawatts of coal-fired power and we continue to rely on coal for the majority of our electric power generation with somewhere between 38 and 40 percent of all utilities currently using coal. There's an even greater reliance on the part of the rural electric cooperatives and public power utilities. Their needs are up to 50 percent on coal-based power, especially rural electric cooperatives who have a heavy reliance on coal. They see value

there. So there is the value that we discuss in the report on a number of different levels, energy security being one of them. Our coal units are immune to weather. They are also less



Janet Gellici

interesting targets for terrorists.

Macro-economic benefits are something we looked at in the value of the existing coal fleet. There's a somewhat complicated calculation that we use to assess the value of the existing fleet. In the report what we did was to take a look at what would happen if we replaced the entire coal fleet with natural gas. Obviously you can't do that. It's not something that is possible to do. It's not something that we would want to do, but it certainly gives us an estimation of the value, and we found basically that if that was to take place there would be a \$240 billion decrease in GDP and a loss of 2 million jobs. That at least gives us some value assessment from a macro-economic perspective on this existing fleet.

A couple other things that we looked at, Bill, was the decline in price stability benefits that coal brings. Coal has continued to maintain a relatively stable pricing. One of the things noted in our report is that it may be difficult to project what the cost of natural gas will be going forward. We've not done a very good job of projecting what those costs are. They are all over the board. I think the only predictable thing on natural gas is that it will be volatile, and that certainly has not been the case with coal. It does offer some price supply stability.

There are obvious environmental benefits that have accrued since the

passage of the Clean Air Act in 1970 on our coal fleet. Since that time, SOx emissions are down 88 percent, NOx emissions are down 82 percent, and particulate matter down 96 percent.

Certainly Supercritical and Ultra-Supercritical plants will be beneficial in reducing CO2 emissions. We think upwards of about 25 percent over some of the older existing coal units. There's a lot of potential in using CO2 for enhanced oil recovery. I think that will get us on an expedited accelerated path towards developing CCS technologies which will help.

Finally we look at some of these job benefits. The secretary asked us to address some of the job benefits associated with making any changes to the existing fleet and improving the capacity. We identified a range of 44,000 to 110,000 jobs that we project could be added with some of the immediate efficiency improvements that could be put into place.

**Coal News:** Also outlined in the study, Janet, are changes that could impact future benefits from the existing coal fleet. Would you tell us some of those please?

**Janet Gellici:** The Study takes an overall look at the changes that could impact the fleet going forward and identified quite a few. The reduced rate of demand for electricity is obviously one. Our electricity demand during the 50s and 60s grew at rates of 6 to 11 percent per year. We have certainly not been seeing that in recent history. In the mid-90s we were down to about a 2.5 percent annual increase in electricity demand. Actually in 2009, 2011, and 2012 there was a negative demand. A lot of

this is due to economic conditions, demand-side energy efficiency, and a shift from manufacturing to services. So there has definitely been a low rate of growth in electric power demand. We feel that this emphasizes the importance of providing policies and technologies that preserve the existing fleet and I equate it with having hard economic times and you not looking to buy a new car necessarily. You'll take your three- or four-year old car and start putting additional work into rather than going and buying a new one. This is the same kind of thinking that we need to apply to our existing fleet. Times are tough and demand is not there. Let's get the most we can out of our existing assets.

One of the other changes that we looked at, Bill, are the natural gas prices. Obviously natural gas prices have been low and that's had an effect on coal-fired generation, but what we see coming out of EIA projections is an actual expected increase of about 3 percent per year between 2012 and 2040 vs. a 1 percent for coal. Those price increases are uncertain but the volatility will be there. Certainly some of the things that natural gas is facing, including increased environmental regulation, expanded market for LNG exports, a strong need for improved pipeline infrastructure in the natural gas markets, all of these things will have an impact on natural gas pricing, so that page has yet to be written.

Environmental regulations are certainly a challenge to the coal fleet going forward. We have a variety of regulations that we are facing. We touch on a few of those in the Study. We don't go into detail as that was outside the scope of our Study, but we've got non-CO2 regulations under Section 316(b) of the Clean Water Act. We have CO2 regulations coming under 111(b) and 111(d) of the Clean Air Act, and there are state regulations with renewable portfolio standards. Certainly, taking a look at the cumulative impacts of all of this, right now our projections are that about 60 gigawatts of coal capacity will be retiring by 2020. That is based on existing regulations as of the end of 2013. So that includes things like MATS, the Mercury Air Toxic Standards but the 60 gigawatts that is projected to come off line does not include the impacts of 316(b) or coal combustion residuals or effluent guidelines or the 111(b) or 111(d). So a 2016 Polar Vortex could be pretty ugly in our estimation.

We devote a significant amount of text in the report to address New Source Review, which is another challenge to the coal fleet. The intricacies of the NSR are regulations really beyond the scope of the NCC Study, but I think the larger concepts were important to understand because they impact the development and use of the technologies that we recommend in the Study. So the Secretary asked us to recommend technologies that could be used to enhance the efficiency, the capacity, and the emissions performance of our existing coal fleet. What we found though is that a lot of these technologies are not things that utilities will consider doing because of the New Source Review regulations. Because they would trigger NSR requirements and cost a significant amount of money, they are not being considered. So our bottom line is basically that NSR is a fundamental barrier to improving power plant efficiency and reliability.

We looked at the age of the fleet. That's certainly a challenge. We saw a lot of growth between 1950 and 1980 in coal capacity, with very limited additional growth after that. Certainly, there is no fixed endpoint for the useful life of a coal plant. It could be 60 years. It could be 80 years. It depends on what you do to invest in it. Just like your car can last you 6 years or it can last 20 years, depending on the maintenance and the attention that you give to it. So we think there are opportunities out there, with relatively quick payback, with some investments and efficiency improvements, and that age is not necessarily a major factor.

Finally, we looked at the budget for our RD&D funding, and I think this will be particularly important for DOE. We addressed the fact that there has been relatively constant funding over the past decade for research and development, but there has not been that same level of support for demonstration projects. DOE used to get an annual appropriation for demonstration projects, but nothing has been received since 2009. We basically have gone 5 or 6 years without any investment dollars being invested in demonstration projects. If you look at the Administration's 2015 budget requests, there is a significant decrease for just research and development funding for fossil energy. It's actually down 64 percent compared to the average appropriations for the past 11 years. So the investment in advancing new technologies for the existing fleet and for new coal power

is not being demonstrated by the Administration through their funding requests

**Coal News:** You've mentioned technologies. Could you outline a couple technologies that you think could be used to maximize the future benefits of coal generation to our society?

**Janet Gellici:** Well, I'm not an engineer, so this is where I am grateful that we had a lot of smart people who could address these things. We covered three areas of technology. The majority of the report is devoted to the technology that could be used to enhance the capacity of the existing fleet. One of the things that we looked at was the flexibility of the fleet. The larger plants that are operating in the United States right now were primarily built to serve as baseload plants, but for a number of reasons they are being called upon to cycle. Thus, they've got a lot of ramp-ups and frequent shutdowns and start-ups, and different factors that are causing them to operate at different levels outside of these baseload modes that they were originally called on to do. That's presenting challenges to the reliability, the efficiency, and the environmental emissions associated with

control equipment that was put on a baseload plant was put there with the understanding that the plant would run continuously in a baseload mode. When you start cycling, it potentially has an impact on the efficiency of the pollution control equipment. So we need to get a better understanding of some of the sensors and monitors that are associated with keeping track of these operations for flexibility.

We looked at a number of technologies related to efficiency. We actually went through the entire powertrain, through the entire power plants to look at what can be done to the coal from when you put it into the boiler as well as other things we can do to benefit the coal, to dry the coal, to reduce emissions, and to increase efficiency all the way through the end. What can we do from a coal combustion residuals impact to improve efficiency of the power plant? We do believe there are modest efficiency gains that are possible now with modest investment but if we want to get greater efficiency improvements we need to invest R&D dollars on things such as advancing topping cycles and bottoming cycles.

Then on the emissions reduction

could be put in place for traditional pollutants, such as air, water, and solid waste.

We need to get a better understanding about when you control something for air emissions what is the impact on solid waste and what is the impact on water emissions and vice versa. So we have to get a better understanding of how they are integrated and work together. We certainly took a look at CO2, and the opportunity to retrofit CO2 technology. Right now, CCS technology is costly and it really has very little market without large subsidies. There are current limited retrofit applications, certainly not outside the realm of possibility in a number of locations, but it is very site specific and we will need to continue to do more R&D and more demos in order to address both the technical issues and the non-technical issues associated with carbon capture and storage. Our bottom line recommendation is that we need to accelerate some of the research and development efforts on CCS. If we are really serious about deploying CCS, things need to move faster.

**Coal News:** Well, Janet, as we come to the end of this discussion, I would be very interested to know how you see

and around the world.

**Janet Gellici:** Certainly, there are lots of opportunities. I think there are a lot of lessons for us to learn from the Polar Vortex experience. One of our recommendations to the Secretary is that we do pay attention to what happened this past winter, and get a good understanding of what the value is of the existing fleet in going forward in terms of our generation mix. We have to take into account the value of low-cost electricity, and the value of the reliability of our sources as well as the value of energy diversity. So it's certainly important to have a diverse assortment of fuel resources available. I think those types of assessments will be important for us as we go forward making decisions on what we are going to do domestically here in the United States.

There is much hope for international market participation on the part of the U.S. Markets for coal are expanding significantly in developing nations, and the U.S. has an important role to play there, not just in terms of coal exports, Bill, but I think of the things that became apparent to us in doing this Study was the opportunity exists for us to look at coal tech-

have, the opportunities that we have for enhancing the efficiency of our power plants, can be used in other places that have less efficient power. We are hearing a lot about the Ukraine, for example, with their coal-fired power generation which is a fairly inefficient fleet. Perhaps there is some potential there. Also, China is building lots of new power plants, but certainly continuing to operate older units where efficiency improvements and emissions improvements are possible. So, we would like to explore those opportunities to benefit again not just America, but other nations as well. We have a tremendous resource here in the United States. We at the National Coal Council are looking forward to being able to provide our input and advice to the Secretary on those matters going forward.

**Coal News:** Well, Janet, we very much appreciate you taking the time to talk to readers of Coal News, particularly as we celebrate our 10th Anniversary. Thank you very much indeed.

**Janet Gellici:** You're welcome, Bill. Thank you again for the opportunity and congratulations again.

**Coal News:** Thank you. We appreciate it!