

Greenhouse Gas Regulations

Presented

to

Chairman Whitfield

Subcommittee on Energy and Power

“The American Energy Initiative”

Presented by:

Steven E. Winberg

Vice President, Research & Development

CONSOL Energy Inc

June 19, 2012

### Summary Points

1. Carbon capture and storage (CCS) and carbon capture, utilization and storage (CCUS) are the most important technology development efforts underway if the world decides to significantly reduce CO<sub>2</sub> emissions from fossil fuels.
2. Reducing greenhouse gases is not a unilateral decision that can be made by the US, but rather a decision that must be made on a global basis.
3. Seventy percent of the increase in global economic output will be by non-OECD countries with China and India making up 31% and 15% of that growth, respectively. The net result is that these countries will eclipse the US in terms of their CO<sub>2</sub> emissions. With all of this coal-fired generating capacity being built around the world, if we are ever to come close to meeting some of the greenhouse gas reduction targets being debated, CCS/CCUS are the most important tools that we can develop.
4. CCUS is an important technology to assist in advancing carbon capture but there is not enough enhanced oil capacity to store all of the CO<sub>2</sub> to meet some of the CO<sub>2</sub> reduction targets being debated and generally, it is too expensive for broad scale deployment. What is needed is commercially-available CCS technologies and this is 10 to 15 years away from the time when CCS suppliers will be able to provide performance guarantees and warranties. This assumes that we have significant private and public sector funding available for CCS demonstration projects; something that we currently do not have.
5. EPA's recently proposed rule titled, **Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units** would require new coal-fueled power stations to meet a 30 year average CO<sub>2</sub> emission of 1000 lbs./MWH with a maximum CO<sub>2</sub> emission rate of 600 lbs./MWH by year 11 of its operation.
6. A power producer would have to begin installing CCS in year 5 to be ready by year 11. Power producers will not make a multi-billion dollar bet that in 5 years, CCS technology providers will offer commercial guarantees. In effect, EPA's rule will eliminate any new coal for years to come because EPA is requiring new coal-fueled power plants to meet a natural gas equivalent CO<sub>2</sub> standard, before CCS technology is commercially available. Without commercial guarantees and warranties from CCS suppliers, power producers cannot get financing. Without financing, power producers will not build.
7. There are a number of very specific CCS advancements that are needed. First, we need to invest in breakthrough technologies that can reduce the cost of capturing and compressing CO<sub>2</sub> from power plants, second, we need to develop a national regulatory framework for storing CO<sub>2</sub> into deep underground formations because a state-by-state patchwork of storage regulations will not work. Finally, we need to build several commercial-scale coal-fueled power plants integrated with CCS to understand the cost and operability and to develop experience with safe, long-term storage of CO<sub>2</sub>.
8. The FutureGen project is one of these much needed commercial-scale demonstration projects and it is imperative that projects like FutureGen get built so that we can commercialize CCS technology.

Thank you, Congressman Whitfield for holding this important hearing.

My name is Steven Winberg. I am the vice president for CONSOL Energy's Research & Development department. Thank you for giving CONSOL the opportunity to express our views on the very important topic of EPA's greenhouse gas regulations which would require significant reductions of CO<sub>2</sub> emissions from new coal-fueled electricity generation.

CONSOL Energy is the largest producer of high-Btu bituminous coal in the United States. Named one of America's most admired companies by Fortune magazine, CONSOL Energy has evolved from a single-fuel mining company into a multi-energy producer of both high-Btu coal and natural gas. Together coal and natural gas fuel two-thirds of the nation's power.

I am also the current Chairman of the FutureGen Industrial Alliance, a 501C3 formed to build the world's first commercial scale coal-fueled, near zero emission electricity generation plant. I will update you on this project a little later in my remarks but want to bring to your attention the facts that 1) this is a research project, not a commercial project, and 2) that the United States is nowhere near ready to deploy carbon capture and sequestration on a commercial basis, nor for that matter, is any other country.

My remarks today will focus on the current state of carbon capture and sequestration technology development and I will update this subcommittee on the FutureGen project.

Carbon capture and storage or CCS as it is often called and carbon capture, utilization and storage or CCUS, are the most important technology development efforts underway if the

world decides to significantly reduce CO<sub>2</sub> emissions from fossil fuels. CCS is generally defined as storing CO<sub>2</sub> in deep saline formations and CCUS is generally defined as using the CO<sub>2</sub> for enhanced oil recovery and then storing the CO<sub>2</sub> in the depleted oil field. CCUS is an important technology to assist in advancing carbon capture but there is not enough enhanced oil capacity to store all of the CO<sub>2</sub> to meet some of the CO<sub>2</sub> reduction targets being debated. What is needed is commercially-available CCS technologies and this is 10 to 15 years away from the time when CCS suppliers will be able to provide performance guarantees and warranties.

CCS and CCUS are more important than renewables technology development, more important than efficiency improvements, and more important than advances in nuclear energy development.

The reason that CCS and CCUS are so important is because reducing global concentrations of greenhouse gases is not a unilateral decision that can be made by the United States. Rather it is a decision that must be made on a global basis. China and India continue to build coal-fueled power plants to power their developing economies and there remain over two billion people or about one third of the world's population that do not have access to electricity. They will continue to use coal to bring themselves out of abject poverty.

According to the International Energy Agency, by 2035, seventy percent of the increase in global economic output – a fundamental driver of energy demand - will be enjoyed by non-

OECD countries with China making up thirty one percent and India fifteen percent of that growth. The net result is that these countries will eclipse the United States in CO<sub>2</sub> emissions because they will continue to build coal-fueled power plants to provide affordable electricity to allow them to develop their economies.

With all of this coal-fired generation being built around the world, if we are ever to come close to meeting some of the greenhouse gas reduction targets being debated, CCS and CCUS are the most important tools we can develop. Another point worth noting is that these greenhouse gas reduction targets would require CCS or CCUS on natural gas plants also. We cannot reach these targets by just controlling coal.

As I stated previously, we are ten to fifteen years away from when CCS suppliers will be able to guarantee this technology and that assumes that we have significant private and public sector funding available for the needed CCS demonstration projects, something that we currently do not have.

EPA's recently proposed rule titled, **Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units** would require new coal-fueled power stations to meet a thirty year average CO<sub>2</sub> emission of one thousand pounds per megawatt hour with a maximum CO<sub>2</sub> emission rate of six hundred pounds per megawatt hour by year eleven of its operation.

In practical terms, this means that a power producer would have to begin installing CCS in year five to be ready by year eleven. Power producers will not make a multi-billion dollar bet that in five years, CCS technology providers will offer commercial guarantees. As I mentioned earlier, at best, CCS may be commercially ready in ten to fifteen years.

In effect, what EPA's rule does is eliminate any new coal for years to come because EPA is requiring new coal-fueled power plants to meet a natural gas equivalent CO<sub>2</sub> standard, before CCS technology is commercially available. Without commercial guarantees and warranties from CCS suppliers, power producers cannot get financing. Without financing, power producers cannot build.

What does it take to commercialize CCS?

There are a number of very specific advancements that are needed.

First, we need to invest in breakthrough technologies that can reduce the cost of capturing and compressing CO<sub>2</sub> from power plants.

Second, we need to develop a national regulatory framework for storing CO<sub>2</sub> into deep underground formations. A state-by-state patchwork of CO<sub>2</sub> storage regulations is simply not workable.

Third, we need to build several commercial-scale coal-fueled power plants integrated with CCS or CCUS to understand the cost and operability and to develop experience with measuring, monitoring and verifying that the CO<sub>2</sub> is stored safely for the long-term.

I mentioned earlier that I am Chair of the FutureGen Industrial Alliance. The FutureGen project is one of these much needed commercial-scale demonstration projects. The Alliance is a group of coal suppliers, power producers and equipment suppliers from around the globe working with the U. S. Department of Energy and the State of Illinois to retrofit an existing 166 MW coal-fired power plant in Meredosia, Illinois. We will capture and sequester more than one million tons of CO<sub>2</sub> per year over a period of at least twenty years. The CO<sub>2</sub> will be stored about one mile underground in a deep saline sandstone formation where it will be extensively and transparently monitored to provide the technical knowledge needed to advance clean coal technology.

It is imperative that projects like FutureGen get built so that we can commercialize CCS technology.

EPA's proposed greenhouse gas regulation will prevent new coal plants from being built in the United States while it will have virtually no impact on reducing global concentrations of greenhouse gases. What this proposed regulation will do is further weaken our country's global competitiveness, prevent us from using a low cost, abundant domestic natural resource with the capability to provide electricity for our citizens for decades to come, and undercut United States job creation just at the time our economy might be beginning to strengthen.

Thank you for your time and attention.