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Coal: A Clean Future

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215 Dirksen Senate Office Building
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Testimony by
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Mr. Chairman and Members of the Subcommittee, thank you for inviting me to appear before you today. My name is Steve Waddington. I am the Executive Director of the Wyoming Infrastructure Authority (WIA). The WIA is an instrumentality of the state of Wyoming. Our mission is to diversify and expand the state's economy through improvements in the electric transmission grid, and to stimulate the development of advanced coal technologies for electricity production.

The WIA was formed in 2004 by the Wyoming State Legislature. The Legislature provides the WIA with bonding ability and other powers, to promote transmission and advanced generation development in the state and throughout the region. The WIA participates in planning, financing, constructing, developing, acquiring, maintaining and operating electric transmission facilities and their supporting infrastructure. In 2006, the Legislature expanded the WIA responsibilities to also promote advanced coal generation technologies.

Introduction – Two Intertwined First Premises

My testimony today on *Coal: A Clean Future* is based upon two equally important premises. The first premise is that the United States and other governments will take action to restrict the emission of CO_2 and other greenhouse gases. The second premise is that coal will continue to play an indispensable role as a primary source of energy to fuel the economy in the United States and around the world. These two premises are intertwined. Governments and industry must continue to work together to confront the essential challenge of how to continue to use coal to meet energy needs while at the same time mitigating carbon emissions in a cost effective manner. Those who say coal should not continue to be used in a carbon constrained world are wrong or

misinformed, as emerging technologies will allow coal to be used to produce clean energy.

New Coal Technologies – The Federal Government's Vital Role

The federal government has a crucially important and large role to play to support the commercial-scale demonstration of advanced coal technologies that capture CO_2. The proper role of the federal government should be to prime the pump for commercial scale demonstrations. These commercial demonstrations should be at a utility scale (250-500 megawatt) and should employ a variety of clean coal technologies. By providing significant financial support to catalyze the investment in emerging clean coal technologies, the federal government will be partnering with the private sector to bring these technologies to the market place.

These clean coal technologies are, by definition, more expensive and technologically risky, compared to conventional coal-fired power plants. As commercial demonstration of these technologies prove successful and a new vintage of clean coal technologies emerge, costs and risks will be reduced and the further need for federal support will diminish. This approach to research and commercial demonstration is not new; in fact, the federal government has played this role for a wide array of technology advancements in the past. In light of the need to address CO_2 emissions, there was never a greater need for federal help to spur clean coal technology deployment than today.

Last week, the Wyoming Authority announced a partnership with a major electric utility – PacifiCorp – to develop an integrated gasification combined cycle (IGCC) commercial demonstration power plant. This will be the first IGCC plant designed and built to use lower-rank western coals at altitudes above 4,000 feet. This groundbreaking project will include both the capture and sequestration of CO_2 and will operate on a long-term commercial basis.

The proposed facility is planned for PacifiCorp's Jim Bridger Plant complex near Point of Rocks, Wyoming. The Bridger site is an existing generating site with four operating coal units. The new 500-megawatt demonstration plant will be designed to utilize Wyoming Powder River Basin coal and other western coals and will meet the other objectives described in Section 413 of the Energy Policy Act to demonstrate IGCC technology at altitudes above 4,000 feet on a commercial scale. The plant is being designed to capture CO_2 that will be sequestered in either a geological formation, or in an enhanced oil recovery environment.

The WIA and PacifiCorp are now seeking significant federal financial support, including appropriations under the provision of the 2005 Energy Policy Act that authorized a western state coal gasification commercial demonstration power plant. An initial appropriation for Fiscal Year 2008 of $50 million is being sought to begin funding this project. Additional requests for appropriations will be made in subsequent years to co-fund the build out of the project. In total, the project is requesting federal

appropriations totaling $500 million. The total capital cost of the project is expected to be well over $2 billion.

Adequate federal funding support for the Wyoming Section 413 demonstration plant is but a small step in what is needed to support a clean coal technology program. While IGCC is today a leading candidate for electricity production with CO_2 capture, it is critically important to demonstrate alternative coal combustion and conversion technologies that include CO_2 capture capability. Federal R&D support in this area is crucial. In this emerging technology arena, it is premature to consider IGCC as the exclusive *technology winner*. Other promising technologies under development deserve federal support, such as ultra-super critical oxygen fired coal combustion, and CO_2 separation methods other than gasification.

Sequestration – A Key Enabler

The sequestration of carbon will be a key enabling technology for coal to continue to contribute to the world's energy needs. Today, CO_2 is injected into older oil fields for purposes of enhanced oil recovery. However, sequestration in large-scale geological formations is untested on a commercial level. It is vital that federal R&D in this area continue and it must be accelerated to allow for a better understanding of how CO_2 reacts in various geological environments. Large-scale injections of CO_2 in a variety of geologic formations are required, to characterize the geology and better understand how CO_2 interacts in these storage media.

Here again, federal RD&D support is vitally important. CO_2 geologic sequestration demonstrations are costly. The recent MIT report entitled *The Future of Coal* suggests that the federal government should immediately fund large-scale commercial demonstration projects to test carbon injection under pressure in various geologic media. MIT suggests such tests should be at levels in excess of one million tons per test. Such a commercial-scale effort will certainly cost many millions of dollars, but it is essential that these tests begin now. The Department of Energy through its Regional CO_2 Partnerships (which involves many universities around the country), are engaged in this important work.

Mr. Chairman, your home state of New Mexico is leading the Southwest Regional Partnership for Carbon Sequestration. That effort is being run by the New Mexico Institute of Mining and Technology. The DOE has contributed $1.6 Million to CO_2 sequestration efforts in that region.

Chairman Baucus' state of Montana is leading the Big Sky Carbon Sequestration Partnership, which is being run by Montana State University. The DOE has contributed almost $1.6 Million to that effort. The University of Wyoming is part of both of these regional partnership collaborations. Unfortunately, these regional partnership efforts need much more help from the federal government, if we are to move to a world of sequestering CO_2 in geologic formations. The pace and overall effort on CO_2 sequestration must be accelerated.

There will also be a necessary federal role in indemnifying companies for long-term sequestration liability risks. Liability after injection presents unique challenges due to the scale and permanent duration of the sequestration. A federal back-stop for very long-term and catastrophic liability will likely be required. This layering of commercially available insurances with a federal back-stop is a framework that has worked in the nuclear industry via the Price-Anderson Act. At a minimum, some form of limited liability protection should be considered to shield those who sequester CO_2.

Congress should also consider tax incentives to encourage the private sector to develop and to deploy CO_2 capture technologies that include sequestration. For example, a volumetric tax credit for CO_2 that is permanently stored in a geologic formation, or used in either an enhanced oil or gas recovery environment, could be a significant market-moving incentive. Such a CO_2 tax credit for sequestration could be structured similarly to the Production Tax Credit Congress has provided to induce the development of renewable sources of energy.

As an example, to reduce the costs of developing commercial-scale IGCC technology, why not provide a CO_2 sequestration tax credit to the developers of the first 6-9 commercial scale clean coal demonstration projects? This form of federal support would serve to lower the significant cost differential of an IGCC project with CO_2 capture, versus the cost of a traditional pulverized coal power plant without CO_2 capture.

Mr. Chairman, I would recommend a tax-credit on the order of $20 per ton for CO_2 that is sequestered permanently in a geological formation and $10 per ton if the CO_2 is used in an enhanced oil or natural gas recovery effort. For a 400-megawatt coal fired plant sequestering CO_2 at 80%, this CO_2 tax credit would yield a federal incentive of approximately $.017 per kilowatt hour. Today, wind, solar and geothermal renewable resources receive a production tax credit of $.019 per kilowatt hour.

Mr. Chairman, to develop a clean coal technology program, we will need more than appropriations from the federal government. We will also need creativity to support CO_2 capture and sequestration and I can think of no better way to do so than through the tax code. Congress has used the tax code to help the energy industry develop the resources our nation needs to compete in the global market place. Why not use the tax code to help propel a clean coal technology program that will allow us to utilize our most abundant domestic energy resource, coal, in an improved environmental manner consistent with the emission performance requirements likely to be put in place in a carbon-constrained world? The genius of American technology development will yield the results we need with proper and focused incentives that share the risk of commercialization.

Transmission Investment Requirements

Adequate transmission infrastructure will also be vital for a clean future using coal. This is especially true in the west, where coal plants can be located at or near mine-mouth, producing electricity that is shipped by wire to load centers. One of the

significant advantages of mine-mouth coal plants in the future will be that in many cases, these facilities are likely to be proximate to prime sequestration opportunities.

The institutional impediments to adequate transmission investment go beyond the scope of this hearing. Suffice it to say that many western states recognize this as a profound problem and are taking proactive measures to address these issues.

In 2004, Wyoming created the Infrastructure Authority, providing the WIA with valuable tools to catalyze transmission investment, including $1 billion in bonding capacity. Today, five additional Western states have joined Wyoming – including most recently, Mr. Chairman, New Mexico – and at least three additional states are actively considering creating state transmission financing authorities.

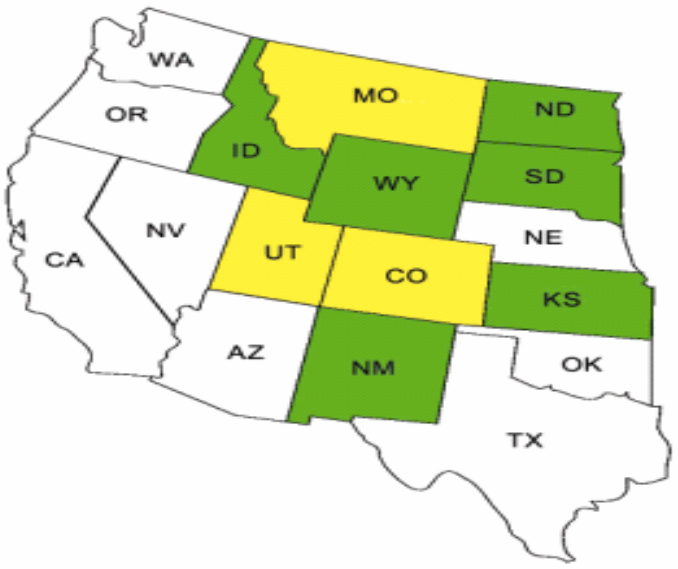

Figure One – States with transmission financing authorities are depicted in green, states actively considering legislation are depicted in yellow.

These western states want to invest in transmission to facilitate energy resource development. Yet under current IRS rules, the bonds of these state entities are not exempt from federal tax. I strongly advocate that this subcommittee consider legislation to relax the so-called *private use restriction* and allow state transmission financing entities to issue bonds for interstate transmission infrastructure development that is not subject to federal tax. This will help to empower states that are trying to make a difference, provide an incentive for needed transmission investment, and ultimately lower costs to end-consumers.

If these state infrastructure authorities were allowed to finance projects using tax-exempt financing, the cost of capital savings of 100 to 150 basis points would significantly reduce the costs of transmission lines to consumers. Today, only

government owned utilities can use tax-exempt financing. Congress should expand the availability of tax-exempt bonding by making it available to state transmission financing entities that are issuing revenue bonds to finance interstate electric transmission facilities with voltages of at least 230 kV.

In Conclusion

There is a clean energy future with coal continuing to play an indispensable role as a source of fuel for electricity and other uses. There is a vital role for the federal government to provide matching funds and R&D to support the emergence of advanced coal technologies. Funds to support a Wyoming IGCC plant with CO_2 capture and sequestration under Section 413 of the Energy Policy Act is essential to this commercial demonstration in the West. Much more is needed to support other coal conversion technologies that allow for CO_2 capture. Sequestration will be the key enabling technology and federal support in a variety of ways will be critical to prove large-scale geologic sequestration. Adequate transmission investments will also be key to a clean future using coal and expanded renewable energy like wind and solar. Congress should enact legislation to empower state financing entities to invest in needed transmission infrastructure with tax-exempt bonds.

Mr. Chairman, it is essential that Congress consider the costs associated with addressing climate change. Significant funding support from the federal government is vital for both clean coal commercialization and CO_2 sequestration activities. Congress needs to examine and enact appropriate tax credit support to lower risks and to jump start CO_2 sequestration. These efforts will be costly and a partnership between the private sector and the federal government will be vitally important.

Mr. Chairman, thank you again for the opportunity to testify today. I would be pleased to answer any questions that you or your colleagues may have.