

Testimony on Senate Bill 2014

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Jason Bohrer, Chairman of the Lignite Research Council
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Good afternoon. My name is Mike Holmes, and I am the director of the Lignite Research Development and Marketing Program. I am joined by Jason Bohrer, the Chairman of the Lignite Research Council. We come before you today in support of continued funding of the Lignite Research, Development and Marketing Program under Senate Bill 2014. We will provide a summary of the program scope and funding, and then highlight a number of the successful results from the North Dakota investments.

The Lignite Research, Development and Marketing Program includes R&D related to “new” technology options for clean and efficient use of lignite. The program is a State/Industry partnership and maintains synergy with the Renewable Energy and Oil & Gas Research Programs as we work toward optimum use of regional resources for clean, efficient, low-cost reliable power while reducing the carbon footprint. The lignite industry benefits from the program as it continues to supply energy to regional residents and industry, while strengthening the economy through creation of jobs and affordable electricity.

The program is primarily funded through the ND Coal Severance Tax of 37.5 cents on every ton of coal mined in the state, as well as a two cents per ton R&D tax. Assuming 30 million tons of annual production – which has been the targeted average going back to 1988 – the severance tax produces \$11.25 million in revenues, split 70/30 between coal counties and the Coal Trust Fund. Of the Coal Trust Fund, 50 percent is dedicated to lignite R&D, and 20 percent is dedicated to Clean Coal Projects. The lignite R&D program receives approximately \$8.5 million a biennium, which is administered by the Industrial Commission, with oversight and guidance from the Lignite Research Council. Over this past biennium, an additional \$10 million was provided by the State from the Strategic Infrastructure and Improvements Fund for supporting the Advanced Energy Technology (AET) projects directed at late-stage evaluation of technologies under consideration for commercial application in North Dakota.

After the Lignite Research Council approves a grant proposal, it is then forwarded to the NDIC, which is comprised of the governor, the attorney general and the commissioner of agriculture, for their consideration of final approval. Again, the NDIC is a partner with the regional lignite industry in the Lignite Research, Development and Marketing Program. State dollars are leveraged with industry investments as well as funding from the United States Department of Energy (DOE) for research, development and demonstration projects. Since 1987 when the partnership began, the state has invested more than \$90 million in lignite research funds. Total investment in more than 200-plus projects is in excess of \$750 million, including industry and federal funding.

As priorities for the Lignite Research, Development and Marketing Program are developed, we work closely with industry to ensure that the industry needs are addressed as well as the State’s priorities. As a result of this planning effort a lignite industry roadmap was developed and is periodically updated as priorities change. The high-level summary of research priorities includes:

- Support continued options to enhance performance of the existing fleet

- Invest in transformational research (Next generation of Lignite conversion systems that integrate CO₂ capture)
- Focus on Carbon Capture Utilization & Storage (CCUS)
- Leverage international R&D breakthroughs
- Renewed Focus
 - Additional value propositions for lignite (new markets)
 - Polygeneration opportunities (coproducts in addition to electricity)

The Lignite Research Development and Marketing Program is a well-recognized and respected program within North Dakota and beyond. There have been numerous successes throughout the history of the program. A small sampling is provided below.

- Optimized operations and cleanability with high-sodium North Dakota lignite.
- Meeting regulatory requirements for sulfur and nitrogen oxides.
- Addressing mercury and trace elements while reducing capture cost by more than a factor of 20.
- Support of the only US coal-to-synfuels plant (Dakota Gasification Company).
- Supporting early work leading to the Spiritwood Industrial complex and the Great River Energy Dryfining coal upgrading technology.

More recently, the investments in carbon capture utilization and storage (CCUS) technology developments have led to commercial interest in capture of CO₂ from North Dakota power plants. The CO₂ can then be stored, either directly in saline formations or during use for enhanced oil recovery in the Williston Basin. In either case a significant federal tax credit can be used to drive the economics while creating additional jobs. Commercial application of the technology in North Dakota would provide two major benefits to the State. These include the critical value of extending the life of our plants and providing a source of CO₂ for producing additional oil from conventional wells nearing the end of economic viability, as well as enhancing oil production in the Bakken. A project titled Project Tundra has been awarded \$20 million in funding from the Lignite Research Program (\$46 million total project size) to perform an engineering study and evaluate the commercial viability of CCUS at the Milton R Young Station (industry leads of Minnkota Power Cooperative and ALLETE). The Project Tundra team is finishing up their economic evaluation and evaluating options to improve the overall economics of the project. A similar study is currently being performed for the Coal Creek Station.

Previously, North Dakota legislators provided funding to support development of the Allam Cycle technology for application in future lignite-fired power plants. Development of the Allam Cycle technology progressed on two fronts. A \$150 million, 50 Megawatts (thermal) demonstration of the technology on natural gas was performed at La Port, Texas, separate from our efforts under the Lignite Research Development and Marketing Program. They made good progress and are pursuing commercial natural gas-fired applications. Initial North Dakota efforts to address potential challenges for application to lignite were completed and the summary report addressed recommendations for gasifier selection, materials of construction for sensitive components, syngas cleanup, and initial studies on the syngas combustion. Additional funding was obtained from the U.S. Department of Energy to further evaluate the needs to address syngas combustion and plan for a future large pilot system.

These are just a few of the many successes and current opportunities. In addition to the activities under the Lignite Research Development and Marketing Program, there are other complimentary activities directed at promoting commercial application of CCUS. We are always happy to provide you with additional information on these or any of the many ongoing projects and opportunities for North Dakota related to our tremendous lignite resource.