

**Testimony of Paul Sukut, CEO and General Manager, Basin Electric Power Cooperative
Before the Senate Committee on Environment and Public Works
February 27, 2019**

Introduction

Good morning Chairman Barrasso, Ranking Member Carper, and members of the committee. My name is Paul Sukut, I am the CEO and General Manager of Basin Electric Power Cooperative (Basin Electric) headquartered in Bismarck, North Dakota. I have worked in the energy industry for 40 years, including over 35 with Basin Electric. I served as the cooperative's Chief Financial Officer and Deputy General Manager prior to becoming CEO in 2014.

Thank you for the invitation to speak this morning about innovation in the utility industry and our efforts to reduce emissions. Basin Electric is a generation and transmission cooperative that provides wholesale electricity to 141 rural electric cooperatives who serve three million consumers in nine states across a high voltage transmission system of over 2,500 miles (owned and maintained).

Basin Electric has a diverse generation portfolio consisting of approximately 6,700 megawatts of coal, natural gas, wind, recovered energy, oil, nuclear power, and market purchase agreements. Our generation resources participate in both the Midcontinent Independent System Operator and Southwest Power Pool regional transmission organizations.

In North Dakota, Basin Electric operates two separate, two-unit coal-based power plants, the Antelope Valley Station and Leland Olds Station. To meet the demands of the rapid development in the Bakken oil fields in Western North Dakota, Basin Electric recently completed deployment of approximately 500 megawatts of natural gas-fired electric generation and over 200 hundred miles of 345-kV transmission infrastructure. As a result, we now own and operate simple cycle natural gas turbines and reciprocating engine generation at the Pioneer Generation Station, along with simple cycle natural gas turbines at the Lonesome Creek Station.

In Wyoming, Basin Electric is a member of the Missouri Basin Power Project that owns the Laramie River Station in Wheatland and is operated by Basin Electric. We also operate one of the newest additions to the coal-based fleet, the Dry Fork Station outside of Gillette, which commenced operation in 2011. In addition to these coal-based facilities, Basin Electric operates 45 megawatts of distributed generation in Wyoming consisting of nine natural gas-fired combustion turbines. Basin Electric also built and operates a simple cycle natural gas turbine at the Culbertson Station in Montana.

The Deer Creek Station - a 300 megawatt natural gas combined cycle plant near Elkton, South Dakota - went into service in 2012. We also operate a two-unit simple cycle natural gas turbine at the Groton Station, as well as an oil-based peaking station near Vermillion. Finally, Basin Electric has also developed and owns nearly 300 megawatts of wind generation since 2009, and has power purchase agreements for over 1,000 megawatts of additional wind power. By 2021, Basin Electric will contract and own nearly 2,000 megawatts of wind generation.

Carbon-Constrained Future

As I've described, Basin Electric and its members have invested billions in capital in recent years to secure its fossil-based generation. In addition to new facilities, such as Dry Fork and Deer Creek, Basin Electric has and continues to invest in the latest environmental controls for its existing facilities - \$1.6 billion to-date. At the same time, we have sought to diversify our portfolio with renewable generation and low-cost power purchase agreements enabled in part by the renewable Production Tax Credit. By next year, 25 percent of the energy Basin Electric will be delivering to our members will be from renewable sources. This investment and diversification in our generation portfolio has significantly lowered our carbon dioxide (CO₂) emissions per megawatt-hour and we expect to continue that trend.

Going forward, Basin Electric is actively-engaged in ensuring that these assets can continue to operate in a carbon-constrained future. One of the biggest factors driving our long-term planning involves what the Environmental Protection Agency (EPA) ultimately does about CO₂ regulation. The Clean Power Plan would have been devastating to rural electric cooperatives. At the time the CPP was released, we estimated a \$5 billion impact to Basin Electric and our members, in both stranded costs for our existing coal generation, and replacement generation to continue meeting load. We support the EPA in finalizing the proposed Affordable Clean Energy rule. This proposed regulation recognizes the improvements made to existing plants, provides for setting a standard that is achievable with cost-effective technologies that can be applied to the facility itself, and allows for flexibility to achieve a unit-based standard.

Basin Electric continues to support reform of other Clean Air Act programs, such as New Source Review, to ensure that utilities can make cost-effective improvements to their facilities that increase efficiency and reduce emissions. As utilities make decades-long planning decisions, it is imperative to have certainty with respect to how regulations impact our facilities and the associated costs to run them. The absence of regulatory certainty creates the threat of not knowing whether we can continue operating a facility through the duration of its estimated life. Our number one priority as a utility, besides providing low-cost and reliable power, is to ensure that our generating facilities do not become stranded assets for which our members still have to pay for yet receive no benefit from. The Clean Air Act directed the EPA to account for remaining useful life in its regulation of existing facilities to address this concern, and regulations need to uphold this important principle.

Innovation

Looking further into the future, Basin Electric remains interested in developing solutions to help crack the code with respect to cost-effective clean coal technologies that capture, utilize, and sequester CO₂. Basin Electric is a partner - along with Tri-State Generation and Transmission Association, and the National Rural Electric Cooperatives Association - with the Integrated Test Center (ITC) located at our Dry Fork Station. Using flue gas provided by Dry Fork, this test facility will provide space for researchers to explore new and innovative solutions to turn CO₂ into a marketable commodity. The State of Wyoming invested in the design and construction of this facility, and oversees its operation. Five teams from several different countries are preparing to move on-site and will compete for the NRG COSIA Carbon XPRIZE.

In addition to the ITC, Basin has been involved with exploring the potential for Allam Cycle technology as an option for future power generation. The Allam Cycle, developed by NET Power, is a new power cycle that utilizes oxy-fired natural gas to produce supercritical CO₂, which is then used as the working fluid in a turbine to generate power with near-zero emissions. Given Basin Electric's long history with coal gasification at the Great Plains Synfuels Plant, and our interest in continuing to utilize North Dakota's vast lignite reserves, we have looked into whether this technology can be deployed with gasified coal. At this point, Basin Electric, and its partners - ALLETE Clean Energy, the Lignite Energy Council, the North Dakota Industrial Commission, and the Energy and Environmental Research Center, have been conducting research on syngas combustion and feasibility while NET Power completes construction and testing at its demonstration facility near Houston, Texas.

I would also like to highlight for the committee a subsidiary of Basin Electric, the Dakota Gasification Company, which operates the Great Plains Synfuels Plant near Beulah, North Dakota. This one-of-a-kind facility produces synthetic natural gas from lignite coal, and produces approximately 600,000 tons of fertilizer co-products including anhydrous ammonia, ammonium sulfate, and a newly-commissioned urea plant that began operation early last year. In addition to fertilizers, the facility produces several chemical co-products such as phenol, naphtha, tar oil, krypton and xenon gases, and liquid nitrogen.

Originally designed to solely produce synthetic natural gas following the 1970s energy crisis, the Dakota Gasification Company has diversified its product stream after acquiring the facility from the Department of Energy in 1988. Today, nearly 80 percent of the plant's revenue is derived from products other than synthetic natural gas. In the process, the Dakota Gasification Company returned over \$1 billion of the Federal Government's original investment in the plant through revenue sharing and surrender of tax credits. Notably, the facility is also one of the largest CO₂ sequestration projects in the world. Approximately three million tons of CO₂ are separated annually during the process of reforming raw gasified coal into pipeline-quality natural gas. Since 2000, more than 35 million tons of CO₂ have been shipped via pipeline to the Weyburn oil field in Saskatchewan and utilized for enhanced oil recovery.

The Great Plains Synfuels Plant has certainly had its challenges throughout the years, but I wanted to highlight that this facility and the development of these products continue to demonstrate what a resource we have in our coal reserves, and what can happen when innovation is unleashed and fostered. I hope this is the kind of progress that we will continue to see from participants at the ITC, and through other initiatives for value-added coal-use and CO₂ capture at the federal and state levels.

Finally, a lot of our discussions on carbon capture tend to focus on the technological challenge of economically capturing CO₂ from electric generation, but the other side of this equation is what you do with CO₂ once it is captured. As I mentioned, Basin Electric, through the Dakota Gasification Company has delivered CO₂ for enhanced oil recovery for nearly two decades. More recently, Basin Electric has participated with the Plains CO₂ Reduction Partnership in the Department of Energy's CarbonSAFE program to investigate geology in both North Dakota and Wyoming, and ultimately develop a large-scale injection test well for CO₂ sequestration. I believe

this program will provide important insight to prove out both geological capacity for permanently storing CO₂, as well as the costs associated with injecting, storing, and monitoring a sequestration well.

Our region is particularly blessed with the geology for CO₂ sequestration and enhanced oil recovery, but either of those options will require additional buildout of pipeline infrastructure to come to fruition. For this reason, we support the Utilizing Significant Emissions with Innovative Technologies (USE IT) Act and its provisions to expedite guidance, permitting, and construction of CO₂ infrastructure.

As a not-for-profit electric cooperative, Basin Electric has a fiduciary responsibility to its members to provide reliable electric generation at the least cost. As I mentioned, we have worked to achieve this goal by diversifying our portfolio with wind and market purchases. Basin Electric has a vested interest in generation sources with long-term fuel certainty, such as coal, that provide affordable power and serve as the backbone of the electric grid. However, in the near-term historically-low natural gas prices continue to drive new generation decisions while regulatory uncertainty makes new coal construction a cost-prohibitive option. Moreover, regional transmission organizations provide no pricing mechanisms to compensate utilities for investment in carbon-free or low-carbon facilities such as nuclear or carbon capture. The markets' failure to recognize and compensate these attributes effectively prevents market participants from spending considerable capital on these technologies.

To this end, we appreciate members of this committee and others for their bipartisan support of policies that allow the Federal Government to be a partner with states and the private sector to prove out technologies, mitigate the risk of uncertainty, and eventually allow for commercial deployment of new electric generation by Basin Electric and other utilities. Legislation such as the 45Q carbon capture tax credit that was expanded last year, as well as the USE IT Act, provide further assistance to relieve the regulatory and financial barriers to carbon capture, utilization, and sequestration, as well as other novel technologies. I thank members of this committee for their support of these legislative efforts.

Conclusion

In closing, there is no shortage of challenges as we seek solutions that balance the need for affordable and reliable energy with the challenge of reducing CO₂ emissions. However, the cooperative model was established specifically in response to a challenge, to extend electric service at the time to those areas no one else would, and continues to serve us well as the electric industry evolves. Basin Electric has undergone a number of changes in recent years, we have a good story to tell with respect to CO₂ reduction, and are well-positioned to serve our members at the end of the line now and well into the future.

Thank you for the opportunity to discuss our thoughts on innovation and technology development in the electric sector, and for your support of these efforts. I would be happy to answer any questions you might have.