

Statement by Lyle Witham to EPA SAB January 21, 2014

**Comments Addressing
The Role of Carbon Capture and Sequestration in
The Environmental Protection Agency's Proposed
Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources:
Electric Utility Generating Units**

January 21, 2014

Comments to: EPA Science Advisory Board
Comments of: Basin Electric Power Cooperative
By: Lyle Witham, Manager of Environmental Services

Thank you for this opportunity to provide these comments to the Science Advisory Board on the commercial availability and cost-effectiveness of carbon capture and long-term geological sequestration of carbon dioxide (CO₂) from conventional utility electricity generation units (EGUs).

My name is Lyle Witham, and I am the Manager of Environmental Services for Basin Electric Power Cooperative headquartered in Bismarck, North Dakota. Basin Electric is a not-for-profit generation and transmission cooperative that provides wholesale electricity to 137 member-owner distribution cooperatives, 2.8 million owner-consumers, and 540,000 square miles of service territory in nine states, with our principle service area being the Upper Great Plains region of the United States.

In general, carbon capture and long-term geological sequestration of CO₂ is not currently a commercially available and economically viable technology for conventional coal-fired steam-turbine electricity generation units (EGUs). We base this statement primarily on two projects:

- Basin Electric's experience with the Great Plains Synfuels Plant (Synfuels Plant), which has captured and stored more than 25 million tons of CO₂ as part of an enhanced oil recovery (EOR) project since the year 2000; and
- A \$6.4 million dollar front end engineering and design (FEED) study Basin Electric conducted from 2007 to 2010 in conjunction with the North Dakota Industrial Commission and the Lignite Research Council to determine the viability of an 120 megawatt equivalent demonstration project for CCS from the Antelope Valley Station EGU located adjacent to the Synfuels Plant. The study concluded that CCS is not either commercially available or economically viable, even with
 - Access to the Synfuels Plant's nearby existing CO₂ pipeline, compressor, and available unused shipping capacity on the pipeline, as well as
 - The approval and availability of a \$100 million grant from the Department of Energy for the project if Basin Electric had proceeded with it.

Basin Electric, through its subsidiary Dakota Gasification Company, owns and operates the Synfuels Plant. The Synfuels Plant is the only commercial-scale coal gasification plant in the country that manufactures natural gas. It is located five miles northwest of Beulah, ND, and has been owned and operated by Dakota Gas since 1988.

The Synfuels Plant is also an international leader in the capture, compression, and sequestration of CO₂. Since 2000, CO₂ that would otherwise be emitted into the atmosphere has been compressed and delivered through a 205-mile pipeline to Cenovus Energy oilfields near Weyburn, Saskatchewan, Canada, and more recently to nearby Apache Canada Ltd. oilfields for use in enhanced oil recovery. The Synfuels Plant exports about 152 million cubic feet per day of CO₂ to Canada—about 50 percent of the CO₂ produced when running at full rates. As of Dec. 31, 2013, the Synfuels Plant has successfully captured and stored more than 25 million tons of CO₂.¹

Capturing and compressing a near pure slipstream of CO₂ as a byproduct of the coal-gasification process, however, is completely different from attempting to capture CO₂ from a conventional EGU like Antelope Valley, where the CO₂ emerging from the boiler comprises only 10-15 percent of the flu-gas stream. Our FEED study for Antelope Valley included a request for proposal (RFP) process where we solicited proposals from the six most promising CCS technology companies we could identify at that time (2007-2008). Basin Electric rejected the first option identified after an attempt to upgrade the technology from bench-scale-lab-testing to pilot-scale proved to be problematic. Basin Electric, in conjunction with the ND Industrial Commission and the LRC, then did a FEED study with the most-apparently-ready demonstration technology we could identify. The FEED study concluded that such a demonstration project would involve at least a \$500 million dollar capital cost for a 120-MW slipstream, and Basin Electric had an insufficient level of confidence that the technology was sufficiently tested and proven to risk doing the project at that time. We therefore declined to proceed with the demonstration project in 2010. The FEED study may be available through the North Dakota Industrial Commission, subject to the proprietary protections that may apply.

We hope these comments are useful to the SAB.

Thank you.

¹ The sequestration has been verified by two comprehensive studies: "IEA GHG Weyburn CO₂ Monitoring & Storage Project Summary Report 2000-2004" (Petroleum Technology Research Centre Regina, 2004), and "Best Practices for Validating CO₂ Geological Storage: Observations and Guidance from the IEAGHG Weyburn-Midale CO₂ Monitoring and Storage Project," (Geoscience Publishing, 2012).