Fact Sheet

May 2024

Carbon Capture and Storage: Promising Technology, But Cannot Meet EPA's Power Plant Mandates

Key Findings

- Electric co-ops are national leaders in the testing and development of carbon capture. Because of this leadership, co-ops understand the complex challenges associated with making carbon capture and storage (CCS) work at coal and natural gas power plants across the country.
- CCS is not yet a commercially available or adequately demonstrated technology. It cannot consistently achieve the capture rates and scales, especially in real-world operations, required by EPA's power plant rule and cannot be deployed nationwide by the mandated deadlines.

Background

America's electric cooperatives are leaders in the testing and development of carbon capture and storage (CCS) technologies. However, serious challenges stand in the way of their widespread adoption.

On May 9, 2024, the Environmental Protection Agency finalized regulations aimed at reducing carbon dioxide (CO_2) emissions from existing coal and new natural gas power plants. This power plant rule would require the widespread adoption of CCS technology. Coal plants and new "baseload" natural gas plants would need to capture 90% of their CO_2 emissions by 2032. Otherwise, these units would need to shut down, co-fire with other fuels, or severely limit their operations.

No power plant is currently achieving EPA's required 90% carbon capture rate consistently for the entire unit. Moreover, on-site CO_2 storage is not feasible in many areas, requiring the construction of massive pipeline networks.

Co-ops are Leaders in CCS Technology

Electric cooperatives are leaders in the development of CCS. NRECA is a sponsoring partner of the National Carbon Capture Center and the Wyoming Integrated Test Center. And in geographic locations where it makes sense, NRECA's members have been actively engaged in the research and deployment of CCS.

- **Minnkota Power Cooperative** is developing **Project Tundra**, a carbon capture project that plans to capture up to 4 million metric tons of CO_2 emissions annually at its Milton R. Young Station.
- **Basin Electric Power Cooperative's** Dry Fork plant is the host site for the **Wyoming Integrated Test Center,** adjacent to the University of Wyoming's **CarbonSAFE** storage project.
- **Golden Spread Electric Cooperative's** natural-gas fired Mustang Station was the subject of a University of Texas at Austin carbon capture feasibility study.
- **Wabash Valley Power Alliance, Southern Illinois Power Cooperative** and **Prairie Power** are part owners of the **Prairie State Energy Campus**, which partnered with the University of Illinois on a carbon capture engineering and design study.
- The **Nebraska Public Power District,** which sells power to **Nebraska Electric Generation & Transmission Cooperative,** worked with ION Clean Energy and the University of North Dakota to evaluate CCS for its coal-fired Gerald Gentleman Station.

CCS Is Not Adequately Demonstrated

Capture: There are no operating coal or natural gas power plants utilizing carbon capture at-scale and that could comply with EPA's regulations. Neither of the two coal units in North America currently using carbon capture have been able to achieve the 90% capture requirement for the entire unit, as required by EPA.

Boundary Dam 3 in Canada, after nearly 10 years of operation, still generally operates on only a portion (less than 80%) of the flue gas at the relatively small 115 MW coal unit. Petra Nova in Texas similarly can only process 39% of the host unit's flue gas.

The EPA's 2032 requirement for its stringent CCS mandate is also unachievable. Initial planning on Minnkota's Project Tundra in North Dakota began in 2015. The project is not expected to be operational until at least 2029 – 14 years after initial planning.

Finally, no natural gas or coal plants have demonstrated an ability to operate in real world conditions, that require units to ramp up and down, while capturing 90% of their CO_2 emissions.

Project Tundra Timeline

- **2015:** Initial concept discussions begin
- **2016:** Early feasibility and research stage
- **2018:** Congress enhances 45Q tax credit; feasibility studies continue
- **2019-2021:** CCS engineering, research and design continue
- **2022:** State of North Dakota provides $100 million loan; Congress further enhances 45Q tax credit
- **2023:** Final project design work begins; North Dakota increases its available loan funding to $250 million; project receives opportunity to negotiate for demonstration funding from U.S. Department of Energy
- **2024:** Potential start of construction
- **2029:** Potential start of operation

Transport: Unless a power plant is located above the right geology for on-site storage – as is the case with Project Tundra – CO_2 will need to be transported to another storage location by pipeline. CO_2 pipelines face myriad challenges, including cost and financing requirements, supply chain challenges, permitting hurdles, land ownership and access concerns, public opposition and other factors. The necessary infrastructure will not exist in time to meet EPA's requirements.

After EPA released its draft rules last year, two major CO_2 pipeline projects were sidelined: Navigator CO2 Ventures canceled its 1,302-mile pipeline and Summit Carbon Solutions postponed construction on its 2,067-mile pipeline until 2026. These two projects accounted for 86.5% of the length of planned pipelines cited by EPA when it claimed infrastructure was available to support CCS.

Storage: EPA has also not adequately demonstrated that CO_2 storage locations can be permitted in the timeframe EPA contemplates, or that sources are located close enough to storage locations to make transportation and storage feasible.

Further, EPA has not demonstrated its own ability to permit the necessary geologic storage. Only four applicants have had EPA permits for CO_2 storage projects approved since 2010. There currently are several dozen pending applications. The EPA has given just three states – North Dakota, Wyoming, and Louisiana – the power to grant permits for CO_2 storage projects.