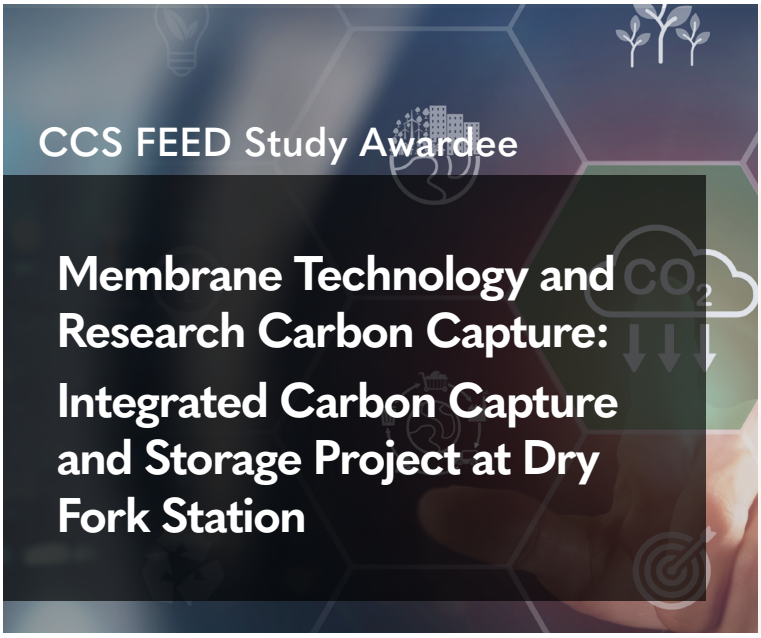
Carbon Capture Demonstration Projects Program Front-End Engineering Design (FEED) Studies

The Carbon Capture Demonstration Projects Program, managed by the U.S. Department of Energy's (DOE) Office of Clean Energy Demonstrations (OCED), aims to de-risk integrated carbon capture and storage (CCS) demonstrations and catalyze significant follow-on investments from the private sector for commercial-scale, integrated CCS demonstrations on carbon emissions sources across industries in the United States. To advance CCS demonstrations, OCED sought applications to execute and complete front-end engineering design (FEED) studies for prospective integrated carbon capture, transport (if required) and storage systems projects. OCED awarded this FEED study in March 2024.



Project At A Glance

- **Project Total:** $9,305,920*
- **OCED Award Amount:** $4,652,288
- **Total Potential Carbon Savings:** 3 million metric tons of CO_2 per year
- **Project Synopsis:** Develop a FEED study for an integrated carbon capture and storage project at Basin Electric Power Cooperative's coal-based power plant, Dry Fork Station
- **Awardee:** Membrane Technology and Research Carbon Capture is a division of Membrane Technology and Research, Inc. that develops and deploys point source carbon capture systems
- **Project Locations:** Dry Fork Station; Gillette, Wyoming
- **Project Start Date:** April 2024

*For FEED study only.

About This Project

OCED is working with Membrane Technology and Research (MTR) Carbon Capture and its strategic partner, The Wyoming Carbon Storage Assurance Facility Enterprise (CarbonSAFE), to complete a FEED study for a proposed capture plant featuring MTR Carbon Capture's second-generation Polaris™ membrane.

The FEED study will analyze the requirements for designing a system to capture, compress, and store 3 million metric tons of CO_2 per year onsite, achieving a minimum carbon capture rate of 90%. The study is focused on the capture technology installed at the site and will assess the potential integration with CO_2 pipeline and geologic storage using CarbonSAFE data. This data comes from completed, current, and planned activities in the Wyoming CarbonSAFE Phase III project, including producing a pipeline FEED study, developing a CO_2 storage field development plan, establishing Class VI well permitting, and ascertaining NEPA compliance through the development of an Environmental Information Volume.

Membrane Technology and Research, Inc. and the Department of Energy have partnered for 15 years to develop this second-generation membrane capture technology, which has the potential to reduce water use, mitigating negative environmental impact and supporting the broader goal of sustainable resource management.

The U.S. Department of Energy established OCED to help scale the emerging technologies needed to tackle our most pressing climate challenges and achieve net-zero emissions by 2050. OCED's mission is to deliver clean energy demonstration projects at scale in partnership with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.

Membrane Technology and Research Carbon Capture CCS FEED Study Project Fact Sheet

Project Site

The project is located in Gillette, Wyoming in Campbell County in the northeastern part of the state. This project is the second Department of Energy award for MTR Carbon Capture at Dry Fork Station. In 2023, under an Office of Fossil Energy and Carbon Management (FECM) award, the company began construction on a large-scale pilot plant at the Wyoming Integrated Test Center to capture CO_2 from flue gas produced at Dry Fork Station. When operational later this year, it will be the world's largest membrane-based carbon capture pilot project.

Community Benefits Plan

A key deliverable for this project includes a Community Benefits Plan (CBP), informed and developed in consultation with the project community. The project team has structured a robust community engagement and outreach plan that builds upon activities already underway, led by the University of Wyoming. Through its community outreach plan, the project will:

- Create and implement a diverse hiring strategy.
- Align project goals with community priorities.
- Assess project impact on disadvantaged communities.
- Increase awareness of carbon capture storage technologies and their potential benefits for all.

Replicability

More than 335 million residents in the United States depend on the energy grid to reliably generate an average of 4 trillion kilowatt hours of power annually, but much of the power generation system relies on fossil fuels to operate. Carbon capture and storage is one important solution that can help reduce carbon emissions and their impact on the environment. Through conducting carbon capture and storage demonstrations, OCED envisions the technology being replicated at power generation plants all over the country, significantly reducing carbon emissions.

To learn more about Carbon Management you can access DOE's Pathways to Commercial Liftoff report or visit the Carbon Management section on the OCED website.

Contact

Program Email: ccdemoprojectsprogram@hq.doe.gov

Site-Specific Email: DryFork_FEED@hq.doe.gov

More Resources

Website: energy.gov/oced/CCFEEDs

Office of Clean Energy Demonstrations: energy.gov/oced

Carbon Management Interactive Graphic: edx.netl.doe.gov/carbonstorage/interactive-graphic/