



NORTH DAKOTA
CarbonSAFE

FACT SHEET

INVESTIGATING SAFE, PERMANENT GEOLOGIC STORAGE OF CO₂ IN NORTH DAKOTA

North Dakota CarbonSAFE – Permanent CO₂ Storage in Central North Dakota

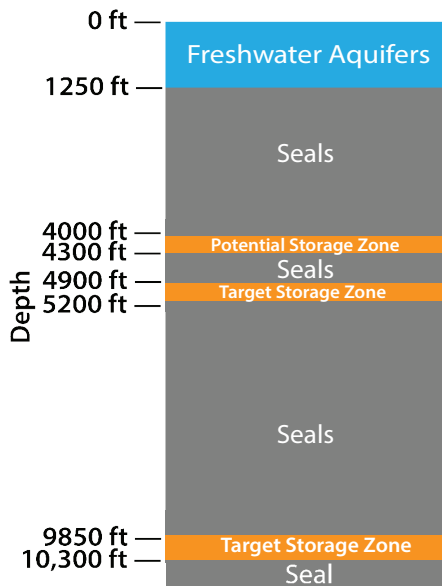
The North Dakota CarbonSAFE project is assessing the safe, permanent geologic storage of carbon dioxide (CO₂) captured from the Milton R. Young Power Station. The project is part of an ongoing effort to ensure clean, affordable energy and the wise use of North Dakota's resources.

Carbon Capture and Storage in North Dakota

About 64% of North Dakota's electricity generation and 67% of energy-related CO₂ emissions come from coal.^{1,2} Carbon capture and storage (CCS) is one option to manage those emissions. CCS captures the CO₂ before it leaves the plant chimney, transports the CO₂ to an injection site (by pipeline), and injects the CO₂ deep underground for safe, permanent storage in a suitable rock layer. CCS is best-suited for large stationary facilities such as coal-fired power plants, cement plants, oil and gas refineries, and agricultural processing plants. ND CarbonSAFE is providing valuable information for implementing CCS in North Dakota.



The 3-year project is focused on the assessment of geologic storage near Young Station and developing the information necessary for permitting.



Three rock layers are being evaluated for CO₂ storage.

Investigating Geology for CCS

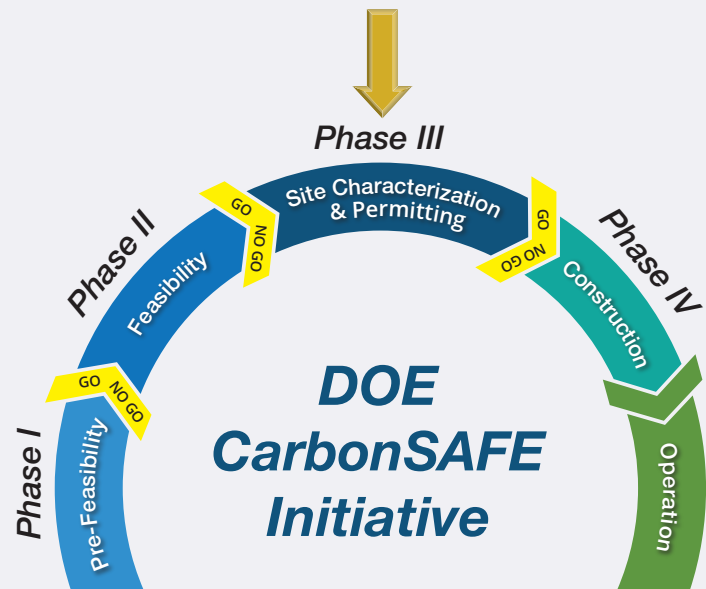
Permanent geologic CO₂ storage requires a deep, porous rock layer to hold the CO₂ and overlying impermeable rock layers to keep the CO₂ in the storage zone. North Dakota CarbonSAFE is focused on three sandstone layers about 1 to 2 miles beneath the surface in Oliver County. The sandstone layers currently contain very salty water and have no oil. Thick shale layers above and below the target layers will act as seals to keep the CO₂ in place. In September 2020, researchers will drill a 10,000-ft-deep exploratory hole at Young Station to extract about 1300 ft of rock samples (cores) and other data from the target formations and the overlying seals. These samples will be tested to determine if they meet the criteria for safe, permanent geologic storage of CO₂. The drilling and coring will follow state regulations that require drilling permits and the protection of groundwater resources. No CO₂ will be injected during this operation. After research at the site is completed, the hole will be sealed with concrete (plugged) in accordance with state regulations. Computer-based geologic models that serve as the foundation for CO₂ injection simulation scenarios will be updated based on the data gathered from these cores, from previously obtained cores and drilling data, and from recent geophysical surveys.

Practicality—Regulatory and Community Considerations

North Dakota CarbonSAFE is gathering information vital to permitting, operation, and monitoring. The project is also collecting local public and stakeholder feedback. Project details will be available to the community through announcements, meetings, other outreach activities, and the project website.

North Dakota CarbonSAFE and DOE's CarbonSAFE Initiative

North Dakota CarbonSAFE is one of five projects to advance to Phase III under the U.S. Department of Energy's (DOE's) CarbonSAFE Initiative.³ DOE's CarbonSAFE Initiative supports projects that address key research in the path toward the deployment of CCS technologies, including the development of safe, permanent, commercial-scale geologic storage sites for CO₂. North Dakota CarbonSAFE was awarded by DOE's Office of Fossil Energy through a competitive process.



DOE envisions four phases to have commercial-scale facilities ready to start storing CO₂ by 2026. North Dakota CarbonSAFE is in Phase III.

Project Timeline and Next Steps

North Dakota CarbonSAFE Phase III began summer 2020. If the assessments show that a commercial CCS project is practical and safe, project partner Minnkota Power Cooperative plans to submit CO₂ storage permit applications to North Dakota state entities to develop a geologic site for permanent CO₂ storage as part of Project Tundra.

References

1. Net generation in 2017. https://www.eia.gov/state/seds/sep_sum/html/pdf/sum_btu_eu.pdf (accessed August 13, 2020).
2. CO₂ emissions in 2017. From Table 3, www.eia.gov/environment/emissions/state/ (accessed August 13, 2020).
3. www.netl.doe.gov/coal/carbon-storage/storage-infrastructure/carbonsafe (accessed August 17, 2020).

North Dakota CarbonSAFE is assessing safe, permanent, geologic storage of carbon dioxide. Led by the Energy & Environmental Research Center at the University of North Dakota, partners include the U.S. Department of Energy National Energy Technology Laboratory and Minnkota Power Cooperative.

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Learn More at:

<https://undeerc.org/NDCarbonSafe> and www.ProjectTundraND.com



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