WYOMING INTEGRATED TEST CENTER *(ITC)* AT DRY FORK STATION

Developer / Lead: State of Wyoming + Basin Electric Power Cooperative (host), with the University of Wyoming School of Energy Resources

Location: Campbell County, WY

Status Category: Operating / Active Pilots

Prepared By: Carbon Solutions

OVERVIEW

The Wyoming Integrated Test Center (ITC) is a large-scale carbon capture research facility located at Basin Electric's 405-MW Dry Fork Station north of Gillette. Commissioned in 2018, the ITC provides slipstream flue gas from an operating coal unit for pilot- and demonstration-scale projects. The facility supports DOE-sponsored carbon capture R&D, private-sector technology developers, and the University of Wyoming in advancing carbon management innovation.

OBJECTIVES

- Provide utility-scale flue gas (20-MW equivalent) to support multiple capture technologies simultaneously.
- Generate performance data under real operating conditions for membrane, sorbent, solvent, and hybrid capture systems.
- Reduce cost of capture toward DOE targets of <$40/tonne CO_2.
- Support training and workforce development through partnerships with UW SER, including internships and outreach.
- Supply data to inform regional Class VI storage initiatives, including Wyoming CarbonSAFE projects.

TECHNOLOGY & DESIGN

The ITC supports flexible pilot integration, with multiple test bays and dedicated tie-ins to Dry Fork Station flue gas ducts. Projects range from skid-mounted membrane modules to large sorbent beds designed for cyclic adsorption/desorption. Systems are monitored for capture efficiency, energy penalty, and CO_2 purity. While no transport or injection infrastructure is part of ITC operations, captured CO_2 performance data feed directly into the design of commercial retrofits and inform Wyoming's geologic storage programs.

TIMELINE / MILESTONES

2018: ITC commissioned at Dry Fork Station.
2024: DOE awards ~$5M for TDA sorbent pilot; Wyoming Energy Authority and industry match funding.
Early 2025: Commissioning and shakedown testing of MTR and TDA units.
Mid-2025: Steady-state operations begin; pilot data collection underway.
Mid-2025: DOE OCED program cancels several large-scale pilots, including TDA's $49M award; pilot testing at ITC continues under smaller scope.
2026+: Results reported to DOE, UW, and industry partners; data incorporated into design studies for commercial-scale CCS.

KEY FACTS

- Flue gas slipstream: 20-MW equivalent from the 405-MW Dry Fork Station.
- Hosts multiple capture systems, including the Dry Fork Carbon Capture Pilot projects:
  - MTR Polaris membrane system: captures ~150 tonnes CO_2/day, >90% efficiency, largest membrane-based CCS pilot globally.
  - TDA sorbent system: designed for ~158,000 tonnes CO_2/yr, >95% CO_2 purity.
- Operations and maintenance contracted to Wood plc beginning 2025.
- Funded through DOE's Carbon Capture Large-Scale Pilot Program, Wyoming Energy Authority cost-share, and industry contributions.
- DOE announced and later canceled some OCED pilot awards in 2025, including TDA's $49M large-scale pilot, though smaller-scale operations continue.

ASSOCIATED PROJECTS

The ITC is directly tied to the **Dry Fork Carbon Capture Pilot**, which hosts both the MTR membrane system and the TDA sorbent system for post-combustion capture testing. These pilots provide side-by-side evaluation of different capture approaches under the same flue gas conditions, generating comparative data on efficiency, energy requirements, and CO_2 purity. Results are being used to guide the design of future full-scale retrofits at Powder River Basin coal plants. In addition, performance data from ITC projects are shared with the **Wyoming CarbonSAFE** program at UW SER, where they are applied to storage feasibility studies and integration planning in Campbell County and the broader region. The ITC also maintains research partnerships with DOE and private developers, allowing new technologies to be tested on rotating schedules as part of national capture and storage R&D portfolios.