

TRIANGLE UNIT RENEWABLE ENERGY & CCS (*TRECCS*)

Developer / Lead: Cowboy Clean Fuels (CCF)

Location: Campbell County, WY

Status Category: Active / Commercial Operations

Prepared By: Carbon Solutions

OVERVIEW

The Triangle Unit Renewable Energy & Carbon Capture and Storage Project (abbreviated TRECCS) is Cowboy Clean Fuels' inaugural commercial BiCRS+RNG project. It converts agriculturally derived feedstocks (notably sugar beet by-products) injected into depleted coalbed methane (CBM) wells and related infrastructure, where natural biogenic processes convert feedstock into renewable natural gas (RNG) and sequester CO₂ in deep coal formations. The project uses existing non-producing CBM wells to provide both the infrastructure and geologic integrity for carbon adsorption in coal seam environments.

OBJECTIVES

- Produce renewable natural gas at scale, targeting approximately 0.7 billion cubic feet of pipeline-quality RNG per year when fully operational.
- Sequester around 180,000 metric tons of CO₂ annually under full project scale.
- Leverage existing coalbed methane wells and related infrastructure in the Powder River Basin to reduce upfront infrastructure needs.
- Utilize sugar beet feedstock or other agricultural by-products to feed the biogenic conversion process.
- Secure regulatory approvals including WDEQ Class V ("Notice to Inject") to enable CO₂ injection and storage, ensuring durability of storage in coal seams.

GEOLOGY & DESIGN

TRECCS uses deep coal formations of the Powder River Basin, leveraging both existing CBM wells (whose coal seams remain for adsorption capacity) and depleted infrastructure. The coal seams are evaluated for safety, permeability, adsorption capacity, and pressure behavior under injection. The system of feedstock injection, microbial conversion to methane + CO₂, methane recovery, and permanent CO₂ adsorption relies on sufficient overburden and sealing layers inherent in deep coal geology.

TIMELINE / MILESTONES

2022–2023: Development phase; permitting; technology licensing from University of Wyoming.

Jan 2024: Awarded ~\$7.8 million from the WEA via the Energy Matching Funds (EMF) program; matched by private investment.

Late 2023: WDEQ Class V "Notice to Inject" permit issued.

Mid-2024 (June): Commercial operations initiated.

2025: Early feedstock injections and operations under way; offtake agreements signed.

KEY FACTS

- Wyoming Department of Environmental Quality has issued a Class V Notice to Inject for TRECCS.
- The project commenced commercial operations around June 2024 under the existing Class V permit.
- Funding sources include approximately \$7.8 million from Wyoming Energy Authority (Energy Matching Funds) plus matched private equity.
- The technology used is called "Biomass with Carbon Removal & Storage plus Renewable Natural Gas" (BiCRS+RNG).
- The project is expected to sequester ~180,000 metric tons CO₂/year and produce ~0.7 BCF RNG annually at full scale.
- Early operations have involved injection of mixed feedstock to begin microbial conversion in coal seams.
- The company has achieved a offtake agreement for carbon-negative RNG under its BiCRS+RNG methodology with Mercuria.

TRANSPORT & SOURCE CONCEPT

Feedstock (sugar beet by-products / agriculturally derived residues) is sourced locally and transported to the Triangle Unit site using existing infrastructure. Injection uses non-producing CBM well-infrastructure repurposed for feedstock injection and CO₂ sequestration. Methane generated from microbial conversion in coal seams is captured and processed into RNG for pipeline distribution. CO₂ is retained in coal via adsorption. The project's infrastructure design allows possible expansion to accept additional feedstock types or sources and connect to regional RNG/RNG-markets once operational scale is validated.

