Cowboy Clean Fuels, LLC

Triangle Unit Renewable Energy and Carbon Capture & Storage Project

Cowboy Clean Fuels, LLC (CCF) is an early-stage clean energy and climate tech company with offices in Gillette, WY and Denver, CO, that was established to commercialize technology developed at the University of Wyoming (UW). CCF is actively developing its inaugural commercial venture in Wyoming's Powder River Basin (PRB) of Campbell County, the "Triangle Unit Renewable Energy and Carbon Capture and Storage Project" (TRECCS). This groundbreaking Project is an example of Wyoming's energy future, harnessing economically depleted coalbed methane (CBM) resources and leveraging existing natural gas infrastructure to produce low-carbon renewable natural gas (RNG) from locally available organic feedstocks, while simultaneously capitalizing on the inherent capacity of coal to permanently sequester substantial quantities of carbon dioxide (CO_2).

The CCF process begins with feedstock injection. Although many other feedstocks can be utilized, CCF is currently focused on feed-grade byproducts of sugar beet refining. As sugar beets grow, they remove CO_2 from the air and convert it into simple carbohydrates, like sugar, through photosynthesis. Refining the beets into crystal sugar results in multiple byproducts, including molasses, that are not meant for human consumption but are ideal for CCF's process. CCF dilutes and injects this feedstock directly into deep coal formations via CBM wells and related natural gas infrastructure that are no longer economically productive. Once in the formation, methanogenic organisms indigenous to the coal naturally convert the feedstock into methane (CH_4) and CO_2. When exposed to the hydrostatic pressure that exists in the formation, the CO_2 is preferentially adsorbed onto the coal surface, permanently sequestering it within the reservoir. The CH_4, however, is not adsorbed as strongly to the coal and can be produced to the surface and brought to market. The geological adsorption of CO_2 in coal seams provides one of the most durable forms of carbon sequestration known, with certainty of permanence over geologic time scales.

Through the duration of the Project, CCF will inject approximately 35,082 tons of molasses into the coal formation, resulting in the generation of 54 mmcf of RNG and the durable sequestration of over 14,840 tons of CO_2. By 2026, when the Project reaches full-scale, 0.7 billion cubic feet (BCF) of RNG will be produced and ~180,000 metric tons of $CO_{2(e)}$ will be sequestered each year. The Project will directly benefit Wyoming's energy and agricultural industries, the state's economy, and its citizens. A study conducted by the UW's Center for Business and Economic Analysis indicates that in 2025 the Project will support 221 direct and indirect jobs. Once at full scale, the Project will result in $8.8m in tax revenues to state and local governments, support 66 direct and indirect jobs and contribute over $36m of added value to Wyoming's GDP every year, including $7.4m in annual wages. CCF will also pay several million dollars in technology license fees to UW each year.

While simultaneously leveraging Wyoming's legacy energy assets and infrastructure and capitalizing on innovations resulting from significant R&D investment, the Project is consistent with and supportive of Wyoming's continued leadership role in Decarbonizing the West and demonstrates how Wyoming can pioneer new clean energy solutions like RNG and Carbon Capture Utilization and Storage (CCUS). By leveraging the state's vast natural and geologic resources, world class infrastructure and skilled workforce, these emerging industries – and CCF's Project – hold significant promise for Wyoming technical innovation and economic development and can play an instrumental role in building resilient communities.

Supported by UW School of Energy Resources, multiple Wyoming-based energy, business, and environmental professionals, and enabled by multiple Wyoming based vendors and suppliers, CCF is building an enterprise true to its "Cowboy" moniker.