



# Fact Sheet

## RECENT WYOMING ENERGY PROJECTS

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The following fact sheet summarizes energy-related projects underway in Wyoming including carbon capture, hydrogen, rare earth elements, nuclear, wind, solar, and hydroelectricity. Several of the projects are awaiting permitting and final approval, while others have begun construction, or have reached the market. Several of these projects strive to reduce carbon emissions and promote energy innovation, while also supporting Wyoming's legacy energy industries.

### CARBON CAPTURE AND HYDROGEN

#### **ATR Partners, Alpha Enriched Air Enhanced Oil Recovery, Carbon Sequestration and Hydrogen Production Pilot Project, Campbell County**

Recent advancements in air separation technology have made air injection for oil recovery economically viable. ATR plans to install air enrichment equipment, initiate injection, and launch a pilot program at the Alpha Field to recover an additional 4.8 million barrels of oil from the site. The project intends to capture and sequester greenhouse gases and produce hydrogen for clean energy generation.<sup>1</sup>

#### **Cowboy Clean Fuels Triangle Unit Carbon Capture and Storage Projects, Campbell County**

This project takes a sugar beet refining byproduct feedstock (molasses) and injects the molasses into deep coal formations via coalbed methane wells and other natural gas infrastructure which are no longer economically productive. After injection, methanogenic organisms naturally occurring in the coal convert the feedstock into methane and carbon dioxide. When exposed to the hydrostatic pressure in the formation, the carbon dioxide is absorbed onto the coal surface, and is sequestered. The methane, however, can be produced for market. Through the duration of the project, Cowboy Clean Fuels will inject approximately 35,082 tons of molasses into the coal formation, resulting in the generation of 54 million cubic feet of renewable natural gas (RNG) and the durable sequestration of over 14,840 tons of carbon dioxide. By 2026, when the project reaches full-scale,

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<sup>1</sup> ATR Partners LLC, Alpha Enriched Air Enhanced Oil Recovery, Carbon Sequestration and Hydrogen Production Pilot Project, Feb. 2024, <https://wyoenergy.org/wp-content/uploads/2024/02/Principle-Petroleum-ATR-public-statement.pdf>.

0.7 billion cubic feet of RNG will be produced and ~180,000 metric tons of carbon dioxide equivalent will be sequestered each year.<sup>2</sup>

### **ExxonMobil Carbon Capture, LaBarge**

An expansion project to capture an additional one million metric tons of carbon dioxide in addition to the six to seven million tons already captured each year, and the installation of a pipeline to transport captured carbon dioxide to a storage reservoir.<sup>3</sup>

### **Tallgrass Energy Eastern Wyoming Sequestration Hub, Laramie County**

The project is studying the potential to sequester carbon dioxide in the Wyoming Denver-Julesburg Basin to support the development of a commercial-scale sequestration hub in Eastern Wyoming. The information from this phase will provide the basis for a full implementation of a regional sequestration hub, which includes Tallgrass's development of a multi-state carbon dioxide transmission system. The project will convert natural gas pipelines to pump carbon emissions from sources across the region and store up to 10.6 million metric tons of carbon dioxide underground every year.<sup>4</sup>

### **University of Wyoming School of Energy Resources, Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production, Wamsutter**

One of the most common ways to produce hydrogen is through the process of steam methane reforming (SMR), which can be combined with carbon capture to create low-carbon or "blue" hydrogen. The School of Energy Resources team is designing, building, and field-testing a supercritical water desalination and oxidation unit, integrated with steam methane reforming functionality, to ultimately produce one ton of hydrogen a day using produced water at a cost of around 15 percent below existing methods. This system will be transportable for demonstration at other Wyoming locations.<sup>5</sup>

### **University of Wyoming School of Energy Resources and Frontier Carbon Solutions, Sweetwater Carbon Storage Hub, Granger**

Frontier has received three Class VI Underground Injection Control Permits from the Wyoming Department of Environmental Quality for carbon dioxide injection. When fully developed, the

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<sup>2</sup> Cowboy Clean Fuels, LLC, Triangle Unit Renewable Energy and Carbon Capture & Storage Project, Nov. 2023, <https://woenergy.org/wp-content/uploads/2023/11/Cowboy-Clean-Fuels-EMF-Project-Summary.pdf>.

<sup>3</sup> ExxonMobil, News Releases, Oct. 2021 [https://corporate.exxonmobil.com/news/news-releases/2021/1021\\_exxonmobil-plans-to-increase-carbon-capture-at-labarge-wyoming-facility](https://corporate.exxonmobil.com/news/news-releases/2021/1021_exxonmobil-plans-to-increase-carbon-capture-at-labarge-wyoming-facility).

<sup>4</sup> Tallgrass Newsroom, Tallgrass to Develop a Commercial-Scale CO<sub>2</sub> Sequestration Hub in Wyoming, May 2024, <https://tallgrass.com/newsroom/press-releases/tallgrass-to-develop-a-commercial-scale-co2-sequestration-hub-in-wyoming>.

<sup>5</sup> University of Wyoming School of Energy Resources, Integration of Produced Water Thermal Desalination and Steam Methane Reforming for Efficient Hydrogen Production, 2024, [https://netl.doe.gov/sites/default/files/netl-file/24RS\\_Poster\\_Nye.pdf](https://netl.doe.gov/sites/default/files/netl-file/24RS_Poster_Nye.pdf).

Sweetwater Carbon Storage Hub is expected to store over 350 million metric tons of carbon dioxide in geologic reservoirs.<sup>6</sup>

## **MINERALS**

### **American Rare Earth Halleck Creek, Albany County**

This project located in Albany County represents two sites, the Cowboy State Mine, and the Overton Mountain Resource area. The project site is fully controlled by American Rare Earths Pty. Ltd. through its subsidiary Wyoming Rare (USA) Inc (“the company”), including four state mineral leases. The company has filed applications with the Wyoming Department of Environmental Quality to begin test mining. Open pit mining will be used for the project with conventional rubber-tired and tracked diesel powered equipment. The latest technical report and surveys conducted by the company estimate a total of 7.48 million tons of contained Total Rare Earth Oxides at the site.<sup>7</sup> Estimated products from the site are lanthanum, neodymium/praseodymium, SEG oxide concentrate,<sup>8</sup> terbium, and dysprosium oxide.<sup>9</sup>

### **Pacific Soda Dry Creek Trona Mine, Green River**

Pacific Soda plans to construct mining facilities and employ solution mining technologies to develop their minerals by mining trona beds 2,300 feet below the surface and processing that trona for market. The mine and processing facility will generate 6 million tons of soda ash and 440,900 tons of sodium bicarbonate each year. Construction is slated to begin during the first quarter of 2025 and will employ an estimated 2,100 construction workers, with 4,200 workers employed during peak construction.<sup>10</sup>

### **Ramaco Brook Mine, Sheridan**

This project entails a major discovery of “unconventional” magnetic rare earth element deposits.<sup>11</sup> The Brook Mine comprises over 15,800 acres outside of Sheridan. Approximately 4,500 acres were permitted for mining in 2020, the site of initial exploration and an assessment program. Initial mine development at the Brook Mine began in the fourth quarter of 2023, following additional

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<sup>6</sup> Frontier Carbon Solutions, Project Executive Summary, May 2023, [https://wyoenergy.org/wp-content/uploads/2023/08/GEMF\\_Project-Executive-Summary-Outline\\_UW-SER\\_Frontier-UW-SER-CarbonSAFE.2023.05.26-2.pdf](https://wyoenergy.org/wp-content/uploads/2023/08/GEMF_Project-Executive-Summary-Outline_UW-SER_Frontier-UW-SER-CarbonSAFE.2023.05.26-2.pdf).

<sup>7</sup> American Rare Earths, Ltd., Halleck Creek Scoping Study Technical Report, March 15, 2024, [https://americanrareearths.com.au/wp-content/uploads/2024/03/rpt\\_23824-0001\\_jorc\\_1-2.pdf](https://americanrareearths.com.au/wp-content/uploads/2024/03/rpt_23824-0001_jorc_1-2.pdf).

<sup>8</sup> Mixed heavy rare earth elements, SEG stands for Samarium-Europium-Gadolinium, which can be separated out into individual elements with further processing.

<sup>9</sup> These elements are important materials for green technologies, like electric vehicles, solar panels, and wind turbines.

<sup>10</sup> Pacific Soda, Pacific Soda is developing a new trona mine in the Green River Basin, May 2024, <https://pacificsoda.us.com/>.

<sup>11</sup> This deposit site is “unconventional” in that the rare earth element deposits are situated in clay strata above and below a coal seam, as opposed to in igneous rock deposits, as is the case in “conventional” sites of rare earth element deposits.

mine planning, pre-development work and assessment. Primary magnetic rare earth elements from the site include neodymium, praseodymium, dysprosium, and terbium.<sup>12</sup>

### **Rare Element Resources Bear Lodge Project, Upton**

Rare Element Resources is building a demonstration-scale plant in Upton to prove the commercial feasibility of the technology to separate and recover rare earth elements from a mineralization deposit north of Sundance. This site contains key magnet materials of neodymium, praseodymium, terbium, and dysprosium, as well as other critical rare earths such as lanthanum.<sup>13</sup>

### **Visionary Metals Corp, King Solomon Nickel and Cobalt Project, Fremont County**

King Solomon Project is a geologic research and development project focused on evaluating Wyoming's mineral resource potential for nickel, cobalt, and platinum group elements. The first step in this project is to evaluate Wyoming's mineral deposits, which contain these critical and strategic elements needed to produce stainless steel and batteries for new hybrid and electric vehicles and air purifying devices like catalytic converters for automobiles.<sup>14</sup>

### **WE Soda, Project West Trona Mine, Sweetwater County**

This 2.6-billion-dollar project expects to come onstream before 2030 with an initial production capacity of approximately three million metric tons per annum. The project will use solution-extraction production technology developed by WE Soda at its existing production facilities in Turkey and will be the first soda ash production facility in the world designed to be powered using up to 100 percent renewable energy, with the objective of delivering carbon neutral production.<sup>15</sup>

## **COAL**

### **Black Hills Energy and Babcock & Wilcox, BrightLoop™ - Blue Hydrogen Demonstration Plant, Gillette**

This project will establish a clean hydrogen generation facility with carbon dioxide capture and use or sequestration at Black Hills Energy's Neil Simpson Power Plant in Gillette. The project will use the BrightLoop™ chemical looping process to produce 15 metric tons of hydrogen a day. It is to serve as a foundation for broader use of Powder River Basin coal in hydrogen production.<sup>16</sup>

<sup>12</sup> Ramaco, Rare Earth Elements and Critical Minerals, May 2023, <https://ramacoresources.com/critical-minerals-rees/>.

<sup>13</sup> Rare Element Resources, Bear Lodge Project Overview, May 2024, <https://www.rareelementresources.com/bear-lodge-project/overview>.

<sup>14</sup> Visionary Metals Corp, King Solomon Nickel and Cobalt Project, Feb. 2024, <https://wyoenergy.org/wp-content/uploads/2024/02/Visionary-public-statement-1.pdf>.

<sup>15</sup> WE Soda, New greenfield soda ash project in Wyoming, USA, Oct. 2022, <https://www.wesoda.com/information/press-releases/new-greenfield-soda-ash-project-in-wyoming-usa>.

<sup>16</sup> Black Hills Energy and the Babcock & Wilcox Company, Project Application Summary, Nov. 2023, <https://wyoenergy.org/wp-content/uploads/2023/11/Black-Hills-Energy-EMF-Executive-Summary.pdf>.

### **Membrane Technology and Research (MTR), Carbon Capture and Storage Activities at Basin Electric's Dry Fork Station, Gillette**

Working at Wyoming Integrated Test Center, MTR is advancing its membrane-based post-combustion carbon capture process through the final pre-commercial stage of development. The goal of this project, which is partially funded by the Department of Energy, is to design, build, and operate a 150-ton-per-day large pilot carbon dioxide capture system using a 10-megawatt-electric equivalent slipstream of flue gas from an active coal power plant, achieve a greater than 90 percent carbon dioxide capture rate, and produce pipeline-quality carbon dioxide.<sup>17</sup>

## **NUCLEAR**

### **BWXT Advanced Technologies, Assessment of Applications, Development of Technologies & Knowhow in Wyoming, Sweetwater County**

Under this project BWXT will work with Wyoming industries to define the requirements for nuclear applications of base heat and power needs of the state's trona mining operations. In addition, the company will perform engineering work to further the design of its BWXT Advanced Nuclear Reactor microreactor system for integration into Wyoming's future power needs. This work will include identifying areas where the state's existing supply chain can demonstrate capabilities for reactor component manufacturing and support reactor deployment.<sup>18</sup>

### **TerraPower Natrium™ Reactor Demonstration Project, Kemmerer**

The demonstration project will feature a 345-megawatt sodium-cooled fast reactor with a molten salt-based energy storage system and flexible power generation. The technology incorporated in the storage system is designed to increase the capacity to 500 megawatts for more than five-and-a-half hours, which is enough to meet the electricity needs of approximately 400,000 households.<sup>19</sup>

## **WIND AND SOLAR**

### **Power Company of Wyoming, Chokecherry and Sierra Madre Wind Energy Project, Rawlins**

Power Company of Wyoming LLC's Chokecherry and Sierra Madre Wind Energy Project is an approximately 3,500-megawatt wind farm located south of Sinclair and Rawlins in Carbon County. The project's long-term surface disturbance will be less than 1,500 acres of a 320,000-acre ranch owned and operated by an affiliate company. Approximately 50 percent of the project

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<sup>17</sup> Wyoming Energy Authority, MTR's Large Pilot Project at Dry Fork Station, Nov. 2023, <https://wyoenergy.org/wp-content/uploads/2023/11/MTR-EMF-public-summary.pdf>.

<sup>18</sup> BWXT Advanced Technologies LLC, Governor's Matching Funds Initiative, August 2023, [https://wyoenergy.org/wp-content/uploads/2023/08/BWXT-AT-Executive-Summary-08\\_07\\_23.pdf](https://wyoenergy.org/wp-content/uploads/2023/08/BWXT-AT-Executive-Summary-08_07_23.pdf).

<sup>19</sup> TerraPower, TerraPower selects Kemmerer, Wyoming as the preferred site for advanced reactor demonstration plant, Nov. 2021, <https://www.terrapower.com/natrium-demo-kemmerer-wyoming/>.

is located on federal land. The project will encompass approximately 600 wind turbines with a 3,500-megawatt nameplate capacity, making this the largest wind farm in North America.<sup>20</sup>

### **Southern Power South Cheyenne Solar, Cheyenne**

The facility consists of bifacial photovoltaic (PV) modules, which allow power to be generated from the front and back side of the module, leading to a gain of up to 20 percent more power generation compared to a monofacial array. The PV modules harness sunlight and the facility converts it to usable AC electrical power through a system of inverters and transformers that feeds into the power grid with a short transmission line running north to a Black Hills Energy substation. This energy is enough to power approximately 25,000 homes. Southern Power released a statement that the site was operational as of April 30, 2024.<sup>21</sup>

## **HYDROELECTRICITY**

### **rPlus Hydro 900 MW Seminoe Pumped Storage, Carbon County**

The Seminoe Pumped Storage Project, if constructed, will be the state's first pumped hydro storage project. The project is currently under review with the Federal Energy Regulatory Commission. The Seminoe Pumped Storage Project is expected to include one new reservoir, underground tunnels and underground powerhouse, an intake-outlet structure in the Seminoe Reservoir, and a new transmission line. The new reservoir will be located about 1,000 feet above the Seminoe Reservoir, approximately 10,000 feet east of the Seminoe Dam.<sup>22</sup>

## **ENERGY INFRASTRUCTURE**

### **Flowstate Solutions, CO<sub>2</sub> and Hydrogen Pipeline Safety: AI-Driven Leak Detection, Casper**

This project uses an AI-driven leak detection system to enhance pipeline transport safety and efficiency for Wyoming's core energy sectors. By providing advanced leak detection for carbon dioxide pipelines (captured from coal plants and used in enhanced oil recovery activities) and natural gas, the technology ensures fewer disruptions, reduces product loss and revenue impacts, and helps companies comply with regulations.<sup>23</sup>

<sup>20</sup> Power Company of Wyoming, Chokecherry and Sierra Madre Wind Energy Project, April 2024, <https://www.powercompanyofwyoming.com/>.

<sup>21</sup> Southern Power, South Cheyenne Solar Facility Fact Sheet, Sept. 2023, [https://www.southernpowercompany.com/content/dam/southernpower/pdfs/fact-sheets/south\\_cheyenne\\_solar\\_facility\\_factsheet.pdf](https://www.southernpowercompany.com/content/dam/southernpower/pdfs/fact-sheets/south_cheyenne_solar_facility_factsheet.pdf); PR Newswire; Southern Power's South Cheyenne Solar Facility in Wyoming is now operational, April, 2024, <https://www.prnewswire.com/news-releases/southern-powers-south-cheyenne-solar-facility-in-wyoming-is-now-operational-302131221.html>.

<sup>22</sup> rPlus Hydro, Final License Application, March 2023, <https://www.seminoepumpedstorage.com/final-license-application>.

<sup>23</sup> Wyoming Energy Authority, Six Projects Awarded with Energy Matching Funds, Jan 2024, <https://wyoenergy.org/six-projects-awarded-with-energy-matching-funds/>.

**Rocky Mountain Power Gateway South Transmission Line, Medicine Bow**

The Gateway South high-voltage transmission line segment, part of PacifiCorp's Energy Gateway transmission expansion project, will extend approximately 400 miles from the Aeolus Substation near Medicine Bow, Wyoming, into the Clover Substation near Mona, Utah.<sup>24</sup>

If you have any further questions, please do not hesitate to contact LSO Research at 777-7881.

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<sup>24</sup> Rocky Mountain Power, Gateway South transmission line receives nod to proceed, May 2022, <https://www.rockymountainpower.net/about/newsroom/news-releases/utility-regulators-grant-certificates.html>.