

DE-FOA-0002735-DAC Hub LOI

Letter of Intent to develop a Wyoming Regional DAC Hub

- **Project Title:** Wyoming Regional DAC Hub TA-2
- **Lead Organization:** CarbonCapture Inc.
- **Organization Type:** Business < 500 employees
- **Whether the application has been previously submitted to DOE:** No
- **% of effort contributed by the Lead Organization:** 50%
- **The project team will include:**
 - The Project Manager for the prime recipient: Patricia Loria
 - Team Members (i.e., subrecipients): CarbonCapture Inc., Frontier Carbon Solutions, Fluor, Twelve, Carbon Direct, INTERA, University of Wyoming, Rocky Mountain Power, Carbon-Based Consulting, Icarus, Novus Energy Advisors
 - Senior/Key Personnel (i.e., individuals who contribute in a substantive, measurable way to the execution of the proposed project):

	Key Personnel	
Entity Name	First Name	Last Name
CarbonCapture Inc.	Adrian	Corless
	Jonas	Lee
	Patricia	Loria
	Saeb	Besarati
	Rob	Whyte
	Meghan	Kenny
	Matt	Bright
Frontier Carbon Solutions	Robby	Rockey
	Steve	Lowenthal
	Alicia	Summers

Fluor	Kasey	Aydogan
	Kenneth	Grier
	Matthew	Reisdorf
Twelve	Ann	Kowalski
	Andy	Stevenson
	Enrique	Cintron
Carbon Direct	Julio	Friedmann
INTERA	Mikey	Hannon
	Rob	Wilson
University of Wyoming	Scott	Quillinan
	Selena Rose	Gerace
	J. Fred	McLaughlin
Rocky Mountain Power	Ron	Wild
Carbon-Based Consulting	Grant	Faber
Icarus	Peter	Minor
Novus Energy Advisors	Emily	Easley

- **Technical Topic Area:** TA-2, Phase I
- **Abstract:**

Alongside multiple partners, CarbonCapture Inc. (CCI) is leading an initiative to develop a regional DAC hub (the “Hub”) that will grow Wyoming’s economy, invest in its diverse communities, reduce its reliance on fossil fuels, and help make the state a global leader in the emerging carbon-removal industry.

Wyoming is an excellent candidate for a DAC hub for the following reasons:

- Excellent geology for permanently storing CO₂. The state has an abundance of geological formations that are ideal for permanently sequestering CO₂. In fact, according to a study sponsored by the Office of Fossil Energy and Carbon Management, the Rock Springs Uplift alone could potentially store 14-17 billion tons of CO₂ in deep saline aquifers;

- Speed. Because the EPA previously approved Wyoming’s application for primacy to implement the UIC program for Class VI injection, The Wyoming Department of Environmental Quality (DEQ) is well-positioned to expedite the review of Class VI UIC injection well applications in the state. Frontier Carbon Solutions, a key member of the Hub project team, has already filed multiple permit applications with the DEQ and anticipates receiving approval to begin drilling Class VI wells in 2023. In addition, CCI has already begun developing the systems and other assets needed to begin initial DAC capture and injection operations in Wyoming in 2024;
- Skilled workforce. Wyoming is home to a workforce with subsurface experience and expertise that would be valuable to the development of the Hub. Further, to encourage the creation of well-paying, long-term jobs and to support their tax base, local communities are welcoming of a new DAC industry to power the state’s economy.
- Alignment with major Bipartisan Infrastructure Law (BIL) goals.
 - A hub in Wyoming would fit the need for at least two DAC hubs to be in regions of the U.S. with high levels of coal, oil, or natural gas resources.
 - Both Eastern and Western Wyoming are identified by the Interagency Working Group on Coal and Power Point Communities and Economic Revitalization as communities hit hard by coal mine and power plant closures. Therefore, establishing a DAC hub in these areas would be supportive of the BIL’s Justice40 goals.
- Multiple opportunities for renewable and low-carbon energy. To power DAC facilities, Wyoming enjoys an abundance of sites favorable for developing solar, wind, and nuclear energy assets; and
- Strong carbon-management support infrastructure. Wyoming has multiple institutions and programs that are well suited to support the development of carbon-management projects, including the School of Energy Resources at the University of Wyoming, the Integrated Test Center, Western Wyoming Community College, Wyoming Pipeline Corridor Initiative, and a Department of Energy (DOE) CarbonSAFE project.

TA-2 Activities

In addition to leveraging the advantages of deploying DAC and CCS technologies in Wyoming listed above, the Hub project team intends to build on the engineering, project development, community engagement, and permitting work that CCI and its partners are actively engaged in to develop a DAC project with secure geologic storage project in Sweetwater County along the western edge of the Greater Green River Basin.

Of note, the project team's anchor sequestration partner, Frontier Carbon Solutions (FCS), has already submitted three Class VI UIC injection well permits to the WY DEQ. Further, in conjunction with Fluor, CCI has completed a pre-FEED (front-end engineering and design study) for a 50k DAC facility.

The primary deliverables of Phase 1 will be:

- A FEED study for a DAC facility that captures and stores 50,000 tonnes of CO₂ per year;
- A FEED study for a power-to-liquids sustainable aviation fuel (SAF) facility that utilizes DAC CO₂ as a core feedstock and will be a substantial off-taker of the project;
- A strategy to develop multiple sequestration sites in the state, including in Sweetwater County and in Powder River Basin;
- A business and deployment plan for a multi-megaton DAC hub that is powered by new clean-energy capacity, incorporates multiple DAC technologies (targeting 30% or more capacity for additional DAC technologies beyond the CCI anchor capacity), and incorporates multiple destinations/applications for DAC CO₂ (e.g., storage, synthetic fuels, etc.)
- Implementation of a comprehensive community benefits plan designed to ensure that WY welcomes the growth of a DAC industry, and that the related economic and ancillary benefits are widely distributed throughout the communities including meeting the goals of the Justice40 Initiative.

CCI will serve as the Prime Recipient for the Hub, providing leadership, expertise, and coordination for all Hub activities, including Justice40.

Project team

Fundamental to the success of the Hub is its diverse project team. The Hub project team will include Frontier Carbon Solutions, University of Wyoming, Rocky Mountain Power/ PacifiCorp, Bridger Valley Electric Association, INTERA Incorporated, Fluor, Freestone Midstream, Twelve, TerraPower, Carbon Direct, Carbon-based Consulting, Icarus, Unions, the Eastern Shoshone and Northern Arapaho tribes, and multiple NGOs. The Hub project team members are committed to the long-term economic and social health of Wyoming, with plans to invest in six major economic drivers for the state: carbon capture and sequestration, clean power, sustainable aviation fuel, union participation, education, and conservation.

Energy

Additional clean-energy resources (renewable and nuclear) will be deployed to support the requirements of the Hub in order to ensure that CO₂ reductions are maximized and to encourage the deployment of renewables onto the WY grid. CCI and the Hub project team will work closely with Bridger Valley Electric Association, Rocky Mountain Power (and parent PacifiCorp), and energy advisor Novus Energy Advisors to develop a clean-energy strategy that meets these goals. Moreover, while small modular nuclear technology is still in the development stage, the Hub project team believes that nuclear energy is core to the global DAC deployment at the gigaton scale. The University of Wyoming will also consult on the energy strategy.

Sequestration/storage

The anchor project (as described by CCI's 50K pre-FEED study) will be in Sweetwater County, close to the town of Granger, WY. The Hub project team intends to diversify geographically by adding storage options in the Powder River Basin (FCS and Freestone Midstream).

Given their leadership in the DOE's CarbonSAFE program, the University of Wyoming will be involved in devising a plan to connect the spokes of the Hub sequestration providers.

Moreover, the Hub intends to use the Wyoming Pipeline Corridor Initiative to connect both southwest and northeast regions of the state. This strategy provides the most flexibility with respect to low-cost siting for both the DAC modules and clean energy, while preserving animal migratory corridors, critical tribal lands, and the natural beauty of the state.

DAC technologies

CCI will be the anchor DAC technology. The University of Wyoming and the Wyoming Business Council are sponsoring a TA-1 DAC Hub application that will include a cold weather test center for multiple DAC technologies to attract them to the state. Our goal is to reserve at least 30% of overall capacity for future DAC technologies (to be detailed in our DAC Hub Capacity Build-Out Plan, a section of the Business Plan).

Additionally, the project team is exploring the potential to deliver, via rail, DAC captured CO₂ outside of Wyoming to sequestration sites in Wyoming. This may expand the effective geographic reach of the Hub to include DAC technologies that are not able to site in Wyoming due to weather or other reasons.

LCA and MRV

Carbon-Based Consulting will participate in the project to ensure we are developing an LCA that accurately reflects complexities around energy, land use, and water.

As we build out the plan for a multi-megaton DAC hub, another goal is to implement next generation MRV that incorporates internet-of-things sensors and other technologies (e.g., blockchain) designed to address customer and regulatory concerns regarding carbon removal credit provenance, ownership, and retirement. Icarus will participate in the Hub project team to lead the development of advanced MRV.

Engineering

Fluor Corporation will be the Project's engineering, procurement and construction (EPC) firm. After conducting a successful FEED study for the anchor development in Sweetwater with CCI and FCS, Fluor will provide materials to support a final investment decision (FID). Assuming a successful outcome, the Hub will move on to detailed engineering and site construction.

Utilization

The Bipartisan Infrastructure Law envisions carbon utilization as a key component of DAC hubs. Thus, the Hub project team will include Twelve, a leader in the manufacture of synthetic aviation fuel (SAF), to pilot a project that uses DAC CO₂ as a SAF feedstock. As a key project team member, Twelve will be engaged in strategic energy, siting, and community engagement decisions, and will conduct a FEED study for a SAF plant capable of generating 500 barrels per day.

Community Benefits Plan

Unions are a key driver of economic development in Wyoming, ensuring that high quality jobs and benefits flow to local communities. CCI is committed to Davis-Bacon fair wage requirements and local economic development. It is exploring opportunities to partner with appropriate unions to provide workers for the 200+ permanent operational and maintenance (O&M) jobs for the WY Hub as well as the 500+ temporary, recurring construction jobs.

Furthermore, CCI is working with the Western Wyoming Community College to develop the first DAC-focused training program in the US. Through our work with local (and state-wide, if comfortable) high schools, we're aiming to provide an early introduction to this upcoming technology that incorporates the Integrated Test Center. This will be the first DAC-specific

training program in the country and will make the Hub a feeder for both a local and national DAC industry.

The University of Wyoming is helping the Hub project team identify and develop strategies to meet Justice40 Initiative and the Diversity, Equity, Inclusion, and Accessibility (DEIA) goals of the FOA. Hub project team members are fully committed to being good stewards of Wyoming's unique tribal heritage and resources, including artifacts, land, water, and wildlife. The project team intends to partner with the Eastern Shoshone and Northern Arapaho to ensure that no sacred lands or tribal artifacts are ever disturbed. Furthermore, the project team will seek to bring direct economic benefits to the Wind River Reservation through job training, conservation or other benefits requested by the tribes. CCI's job training program will include native members.

Finally, to ensure that the Hub's facilities do not interfere with migration or animal movement, the project team is partnering with The Nature Conservancy and the Wyoming Outdoor Council to perform wildlife corridor studies. In addition, CCI intends to help to preserve the state's iconic state animal by investing in expansion of bison habitats.

Water

The WY Hub will partner with INTERA, the Governor's working group, The University of Wyoming, Freestone Midstream, and other state-based organizations to develop a water strategy that considers the immediate and long-term needs of the state.