

# Wyoming: A Hub of CCUS Activity

*Prepared for*

Clean Coal International Symposium

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**September 5, 2023**



UNIVERSITY  
OF WYOMING

School of  
Energy Resources

*THE WORLD NEEDS MORE COWBOYS.*

# SER's Mission:

Energy-driven  
economic  
development for  
Wyoming



*BUCKING  
THE SYSTEM  
SINCE 1886.*

# Wyoming Target and Strategy

*“Today, I challenge you to join me in making Wyoming net negative in CO<sub>2</sub> emissions,” he said. “Fossil energy makes that possible. We have to take the lead and not look back...”*

*Governor Mark Gordon  
2021 State of the State*

*July 2023 - “...launched **Decarbonizing the West**, an initiative examining how decarbonization strategies and technologies, including carbon capture, utilization, and storage (CCUS) technologies, direct air capture (DAC), and natural sequestration can position western states at the forefront of innovation and reduce the effects of carbon emissions on the environment.”*

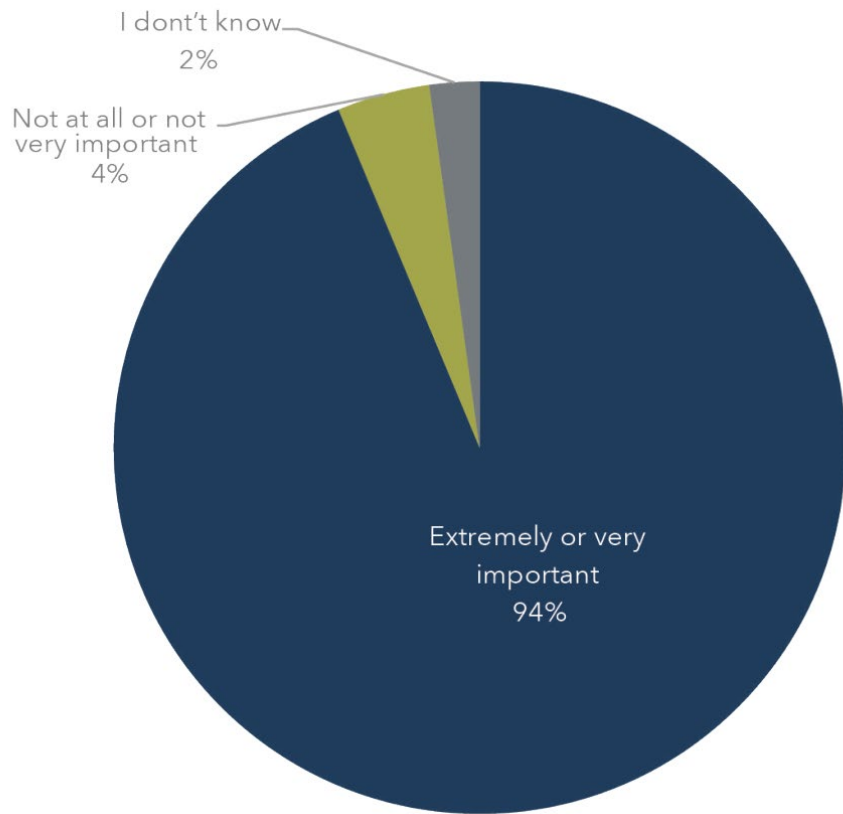
*Western Governors Association Incoming Chair – Mark Gordon*



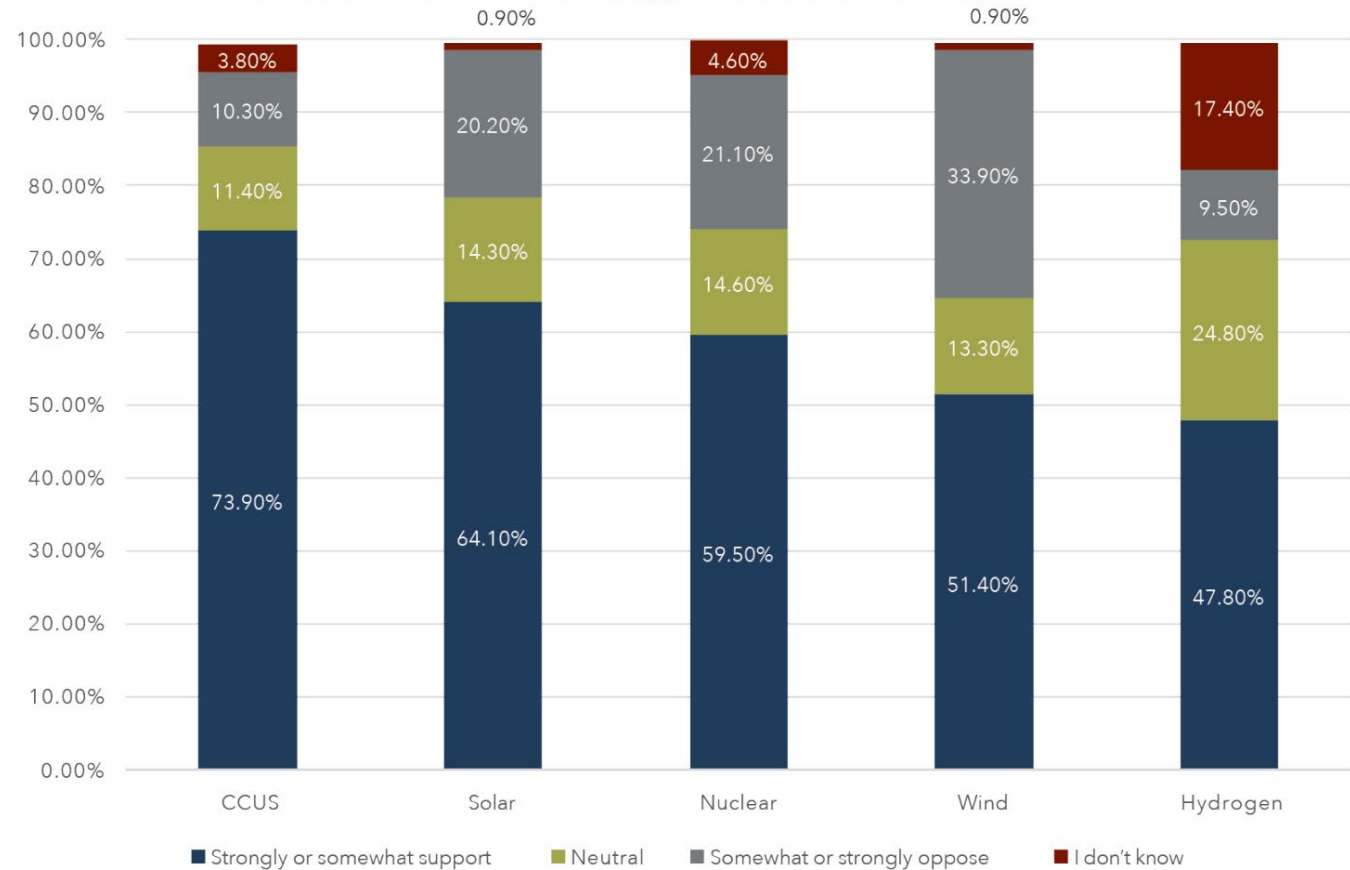
**Wyoming Governor  
Mark Gordon**

# Wyoming Energy Community Perceptions (I-West)

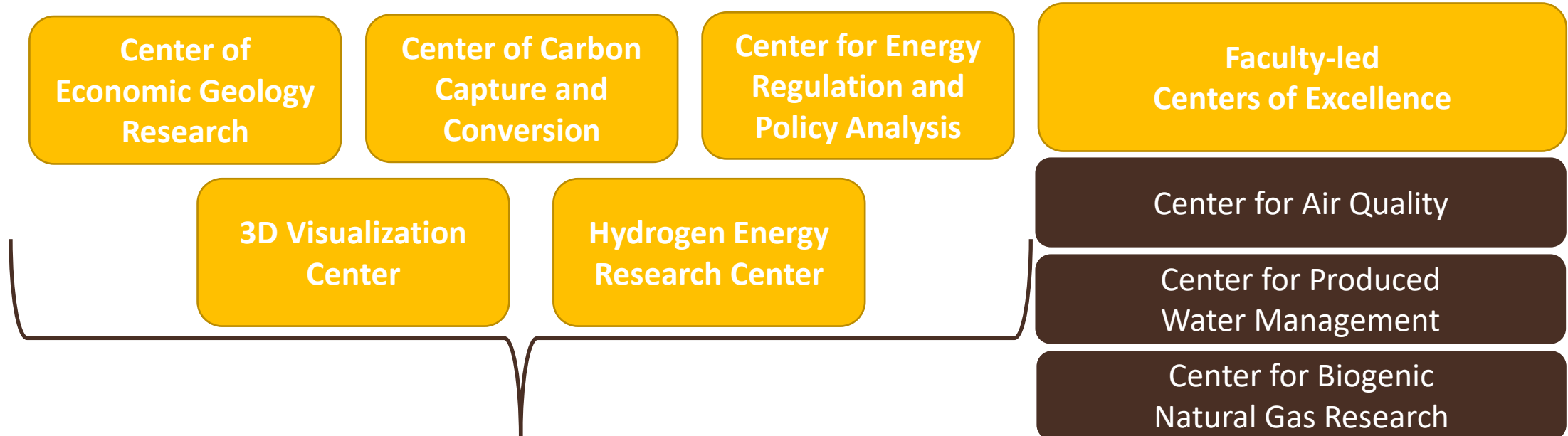
How important do you think it is for Wyoming to continue supplying energy to the region in the next 20-50 years?



How supportive of or opposed to the following carbon-neutral energy industries are you?



# SER Research Structure



## Staff-led Centers of Excellence





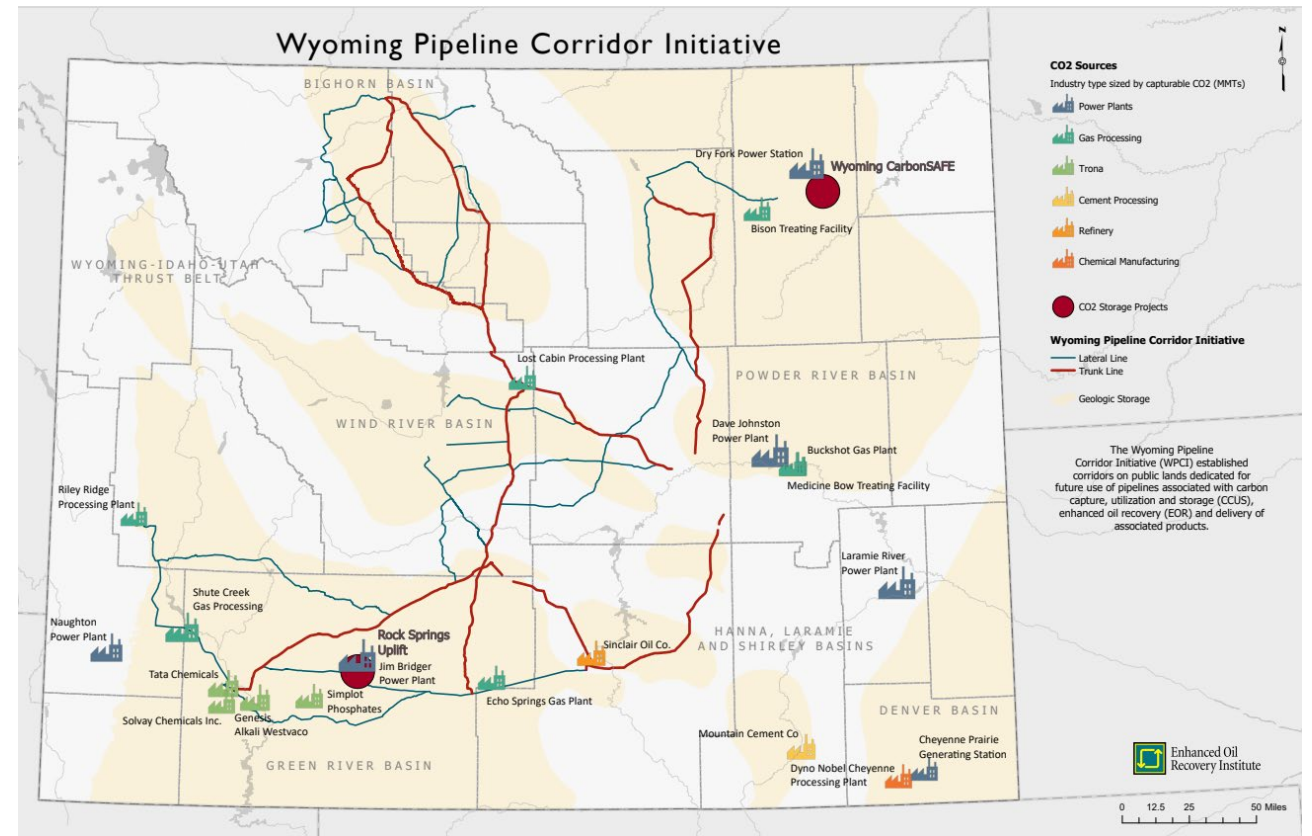
# Select Research Topics

- Carbon engineering (coal to products)
- Carbon capture, use and storage
- Oil and gas production
- Visualization
- Methane detection
- Rare earth elements and critical minerals
- Coal markets and sales
- Combustion
- Energy policy and economics
- Hydrogen
- Nuclear
- Produced water management
- Applied geologic research
- CO<sub>2</sub> in concrete



# Wyoming is ready to support deployment

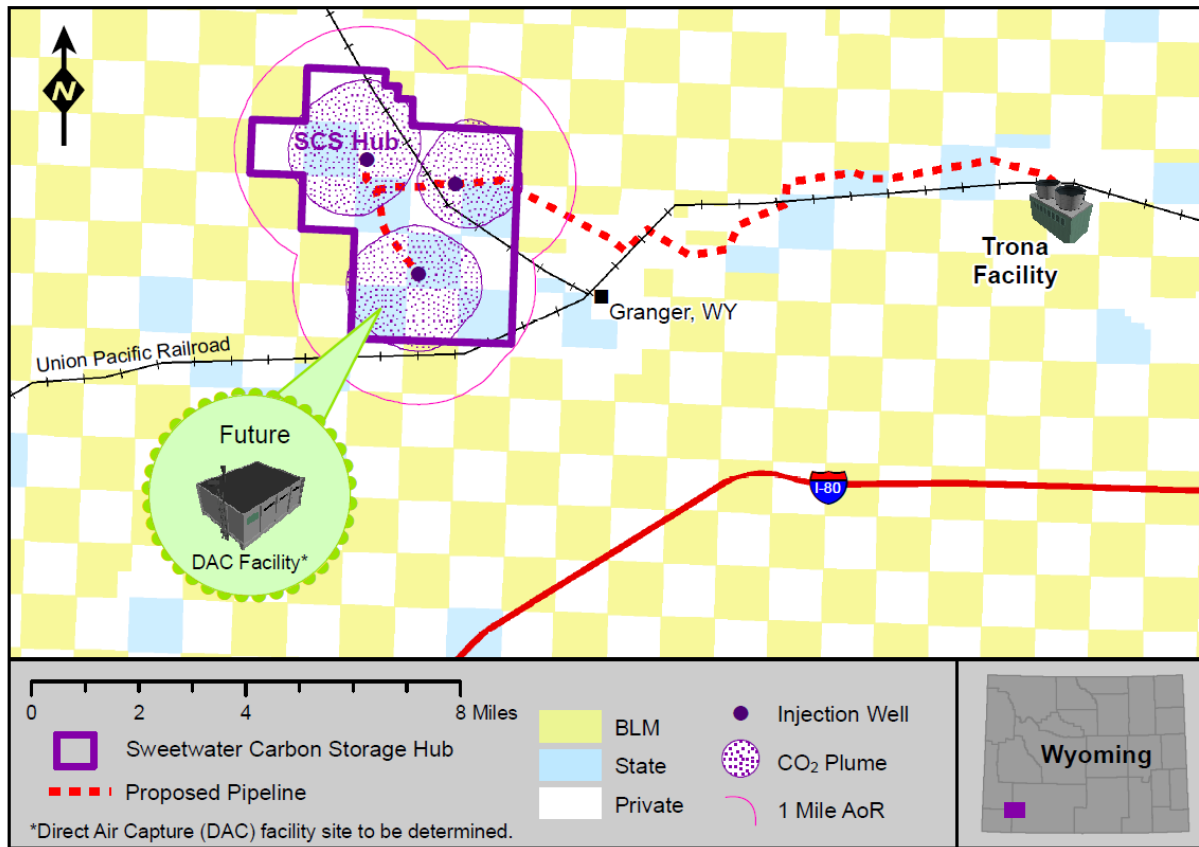
- ✓ Wyoming Pipeline Corridor Initiative (WCPI)
- ✓ CCUS friendly regulatory framework
- ✓ Primacy for CO<sub>2</sub> injection
- ✓ Potential CO<sub>2</sub> targets identified in every Wyoming geologic basin
- ✓ Storage capacity for over 26 billion tons of CO<sub>2</sub> storage
- ✓ Wyoming Integrated Test Center
- ✓ National and international reputations in CCUS





# Wyoming CarbonSAFE Projects

## Sweetwater Carbon Storage (SCS) Hub



## Wyoming CarbonSAFE Phase III

Focused on investigating the **feasibility** of practical, secure, **permanent**, **geologic storage** of carbon dioxide (**CO<sub>2</sub>**) emissions from coal-based electricity generation facilities near Dry Fork Station Gillette, Wyoming....

Preparing CarbonSAFE  
Phase 4 Application

The goal of the \$50 million SCS Hub with partner Frontier Carbon Solutions is to provide carbon management opportunities to SW Wyoming, developing storage resources for trona, natural gas processing, direct air capture...

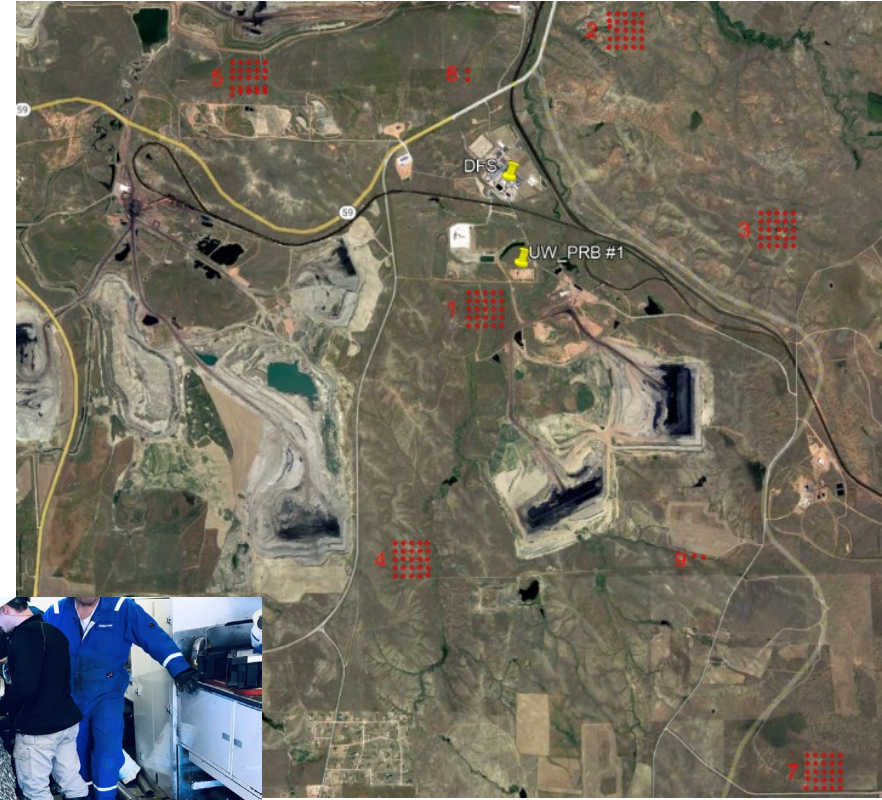


# Wyoming CarbonSAFE Project

## CarbonSAFE firsts in Wyoming...

- Wells drilled and completed for Class VI activities
- Baseline monitoring network
  - Soil
  - Groundwater
  - Passive seismic
- NEPA assessment(s)
- CCUS-focused outreach and education
- Business and economic models
- Publically available project data\*

\*<https://www.uwyo.edu/cegr/research-projects/carbonsafe-p2-dryfork.html>

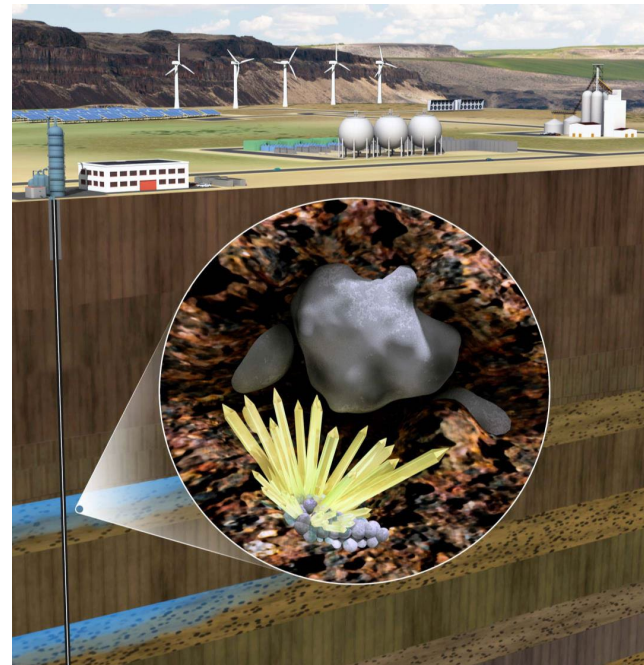




# HERO Basalt CarbonSAFE (Hermiston Oregon Carbon Storage Assurance Facility Enterprise) ; CarbonSAFE Phase II

**Project Summary:** HERO Basalt CarbonSAFE will accelerate scale-up and deployment of commercial CO<sub>2</sub> capture and storage projects in basaltic rocks—the largest potential CO<sub>2</sub> storage resource in the Pacific Northwest.

*Currently in award negotiations*

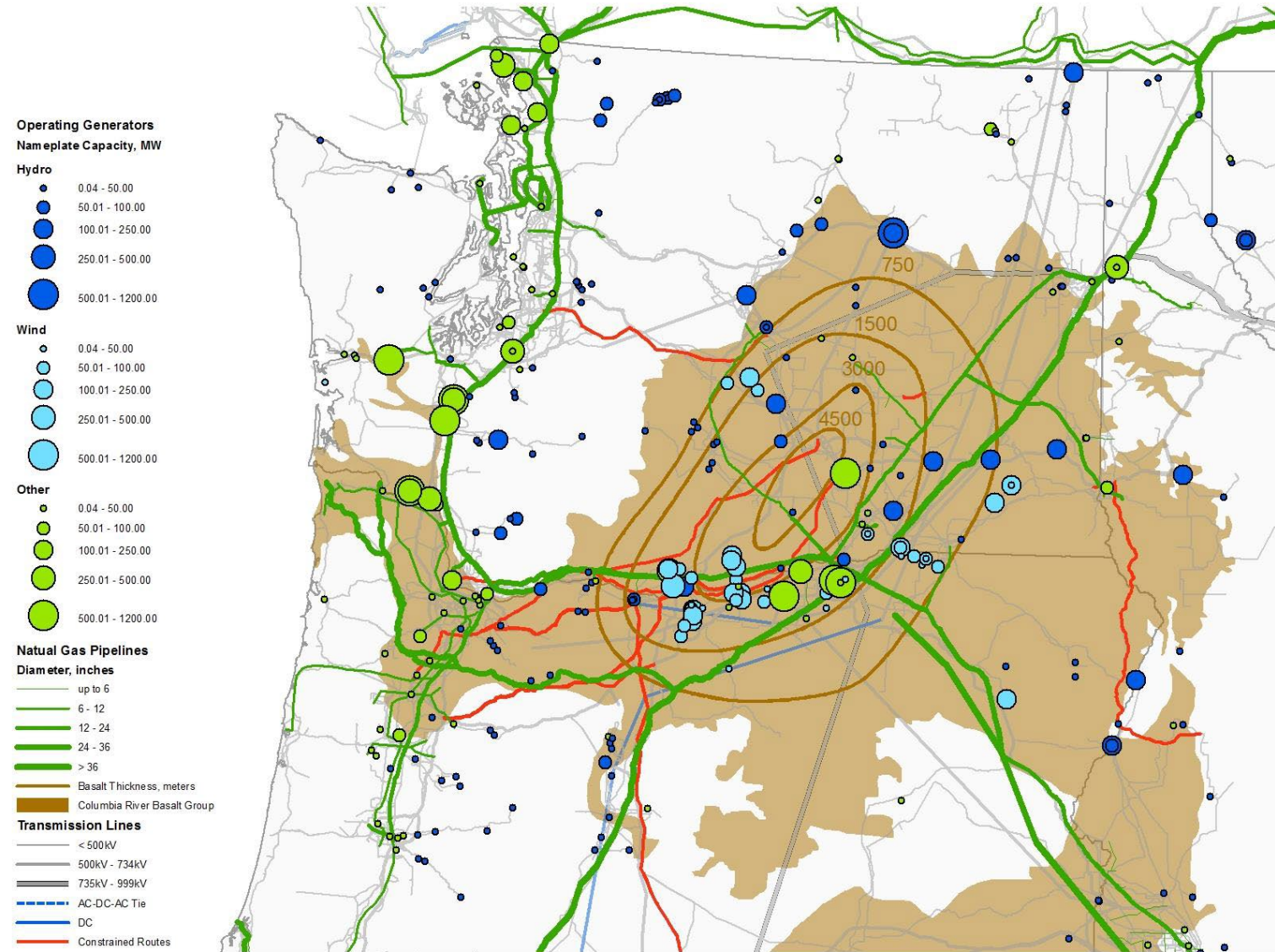




# HERO Basalt CarbonSAFE (Hermiston Oregon Carbon Storage Assurance Facility Enterprise)

## Benefit to Wyoming

- First evaluation of developing carbon storage solutions for Scope 3 emissions, in this case Wyoming natural gas into its largest market
- There are limited studies on basalt injection and mineralization; this project will provide invaluable science/operational experience for staff





# BEPC's Dry Fork Plant: CCS Innovation Hub



## Dry Fork Station

- ✓ Built in 2007
- ✓ 385 MW
- ✓ 3.3 million tons of CO<sub>2</sub>/year
- ✓ Zero H<sub>2</sub>O discharge
- ✓ Newest, cleanest, PC plant







- Large Test Center
- Flue Gas Duct
- Small Test Centers
- ITC Offices
- Parking Lot

# Status Update

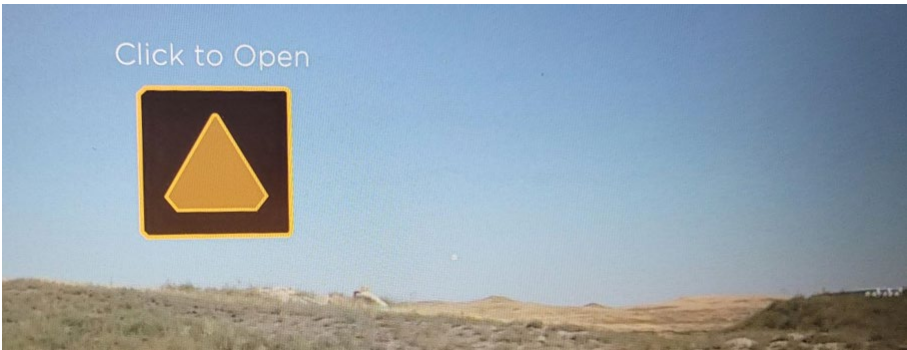
## Carbon Capture: Membrane Technology Research FEED And Large-Scale Capture Pilot



July 24, 2023

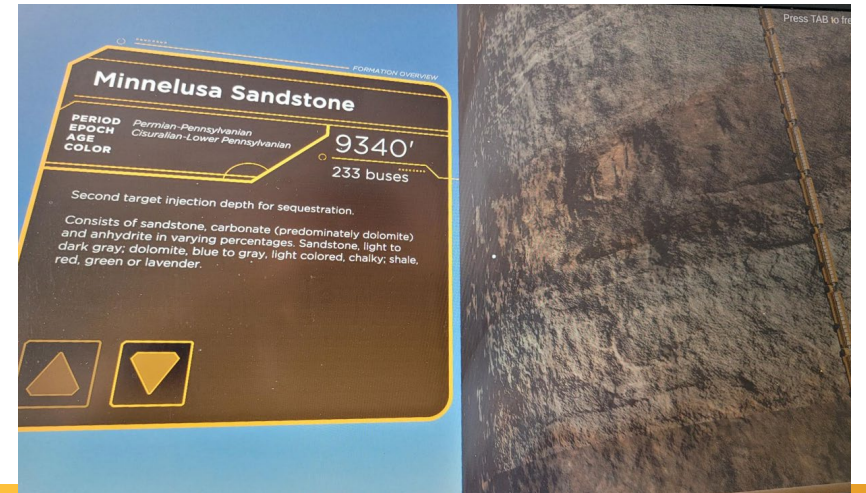
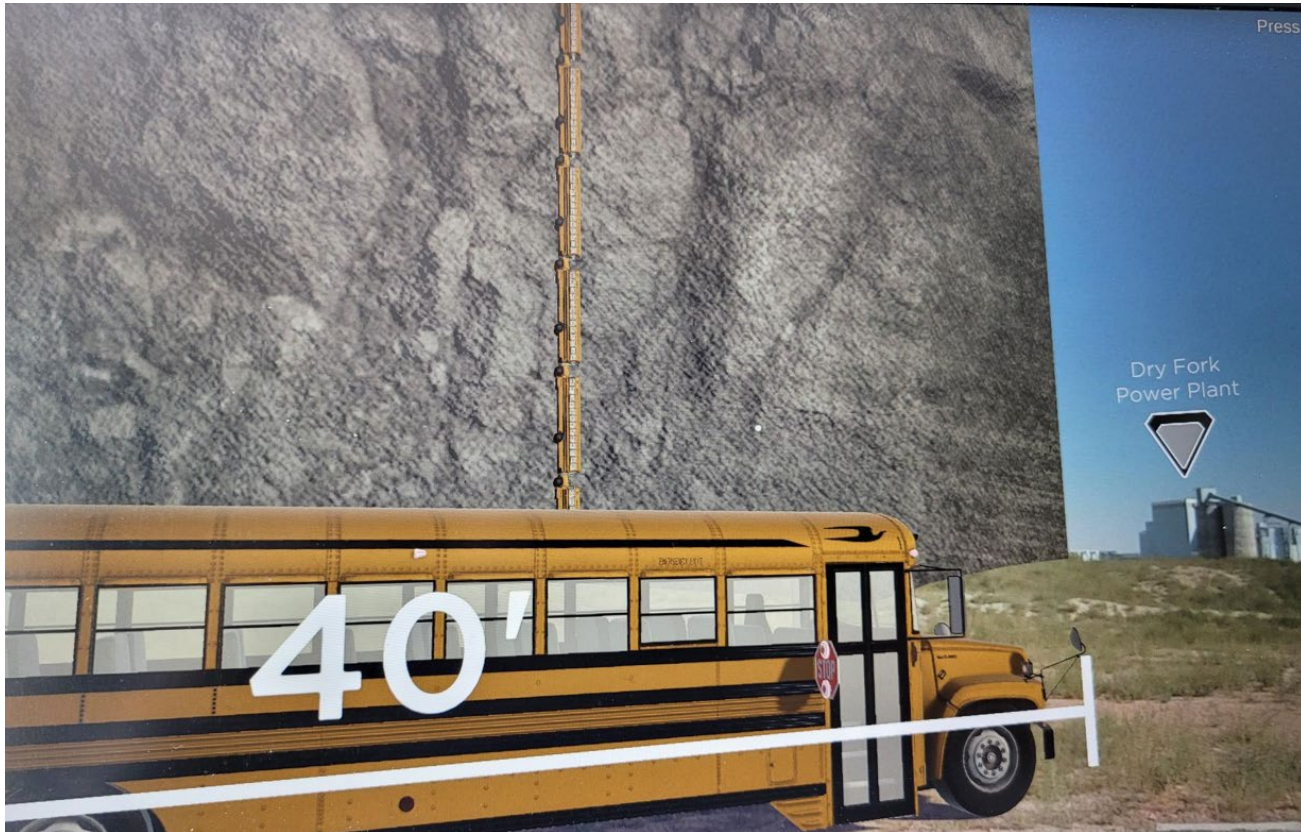


# Tools for public engagement






# Tools for engagement





# Other engagement highlights

**CarbonSAFE: Onshore Legal and Regulatory Workshop**



May 22-23, 2023  
BP Collaboration Room  
Energy Innovation Center  
University of Wyoming

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**WHAT EVERY WYOMING LANDOWNER SHOULD KNOW ABOUT CARBON CAPTURE AND STORAGE**

A CCS RESOURCE GUIDE AND FREQUENTLY ASKED QUESTIONS

By Carson Tanner, J.D/M.A.  
& Tara Righetti, Professor of Law and Occidental Chair for Energy and Environmental Policies  
2023



EPA Administrator Regan visits SER and Dry Fork Station

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