



OCEd
Office of Clean Energy Demonstrations

THE OFFICE OF CLEAN ENERGY DEMONSTRATIONS



Carbon Capture Pilot at Dry Fork Power Station: Community Briefing

February 22, 2024

Office of Clean Energy Demonstrations

U.S. Department of Energy

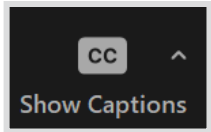
Welcome & Meeting Objectives

- The Office of Clean Energy Demonstrations (OCED) at DOE recently announced the selection of four Carbon Capture Large-Scale Pilot Projects, including one in Gillette, Wyoming.
- We at DOE want to share more information on this project and the opportunities to plug in and help shape your community's energy future.
- Engage with DOE and the partners involved in this project.



Briefing Logistics

How do I turn on live captions?

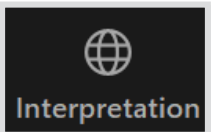


Click on the “**Show Captions**” button in the control panel at the bottom of your screen.

Is this briefing being recorded?

No, this briefing is not being recorded in order to encourage open dialogue and participation from all attendees.

How do I turn on Spanish or ASL interpretation?



Click on the “**Interpretation**” button in the control panel at the bottom of your screen.

Will the slides be shared?

Yes, a copy of the presentation slides will be shared via email with registrants and on the OCED website within the next few days.



Agenda

- Welcome & Objectives
- OCED Overview
- Carbon Capture Large-Scale Pilot Projects Program Overview
- Carbon Capture Pilot at Dry Fork Power Station Overview
- Next Steps & Resources
- Feedback Session
- Wrap-up & Close



OCED Overview



John Brown,
Stakeholder Engagement
Lead, Carbon Capture,
OCED

OCED Mission

Deliver clean energy technology **demonstration projects at scale** in partnership with the **private sector** to **accelerate deployment, market adoption**, and the **equitable transition** to a decarbonized energy system.



Prioritizing Community Benefits in OCED Projects

OCED **requires** applicants to include a Community Benefits Plan to help ensure broadly shared prosperity in the clean energy transition.

By **prioritizing community benefits**, we can ensure the next chapter in America's energy story is marked by greater justice, equity, security, and resilience.

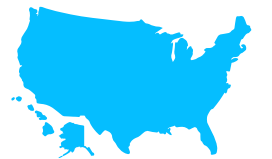
Community & Labor Engagement



Diversity, Equity, Inclusion, & Accessibility



Investing in the American Workforce



Justice40 Initiative



Carbon Capture Large-Scale Pilot Projects



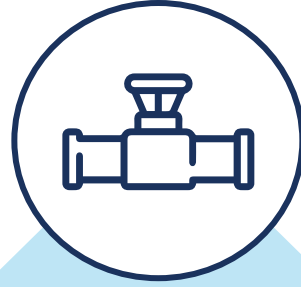
Todd Shrader,
Deputy Director, Project
Management, OCED

How Does Carbon Capture, Utilization, and Storage Work?



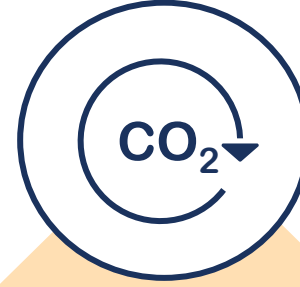
CAPTURE

- Power plants, industrial facilities
- Reduces CO₂ emissions



TRANSPORT

- Compressed CO₂
- Transported by pipelines, road, rail, or ships



UTILIZATION

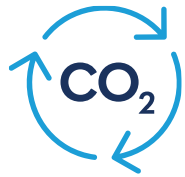
- CO₂ is used to make products
- E.g., fertilizer, building materials, chemicals, fuels



STORAGE

- CO₂ stored safely and permanently
- Deep geologic formations underground

Deploying Carbon Capture Technology has the Potential to...



Reduce harmful carbon pollution by preventing carbon emissions from entering the atmosphere.



Demonstrate technology leadership and increase U.S. competitiveness in the global energy transition.



Deliver cleaner air by reducing health-harming pollutants, like SO₂, NO_x, and particulate matter.



Maintain good, high-wage jobs while advancing the clean energy economy.



Decarbonize existing infrastructure and assets in the power and industrial sectors.



Support our nation's net-zero goals and help the world decarbonize at existing facilities.



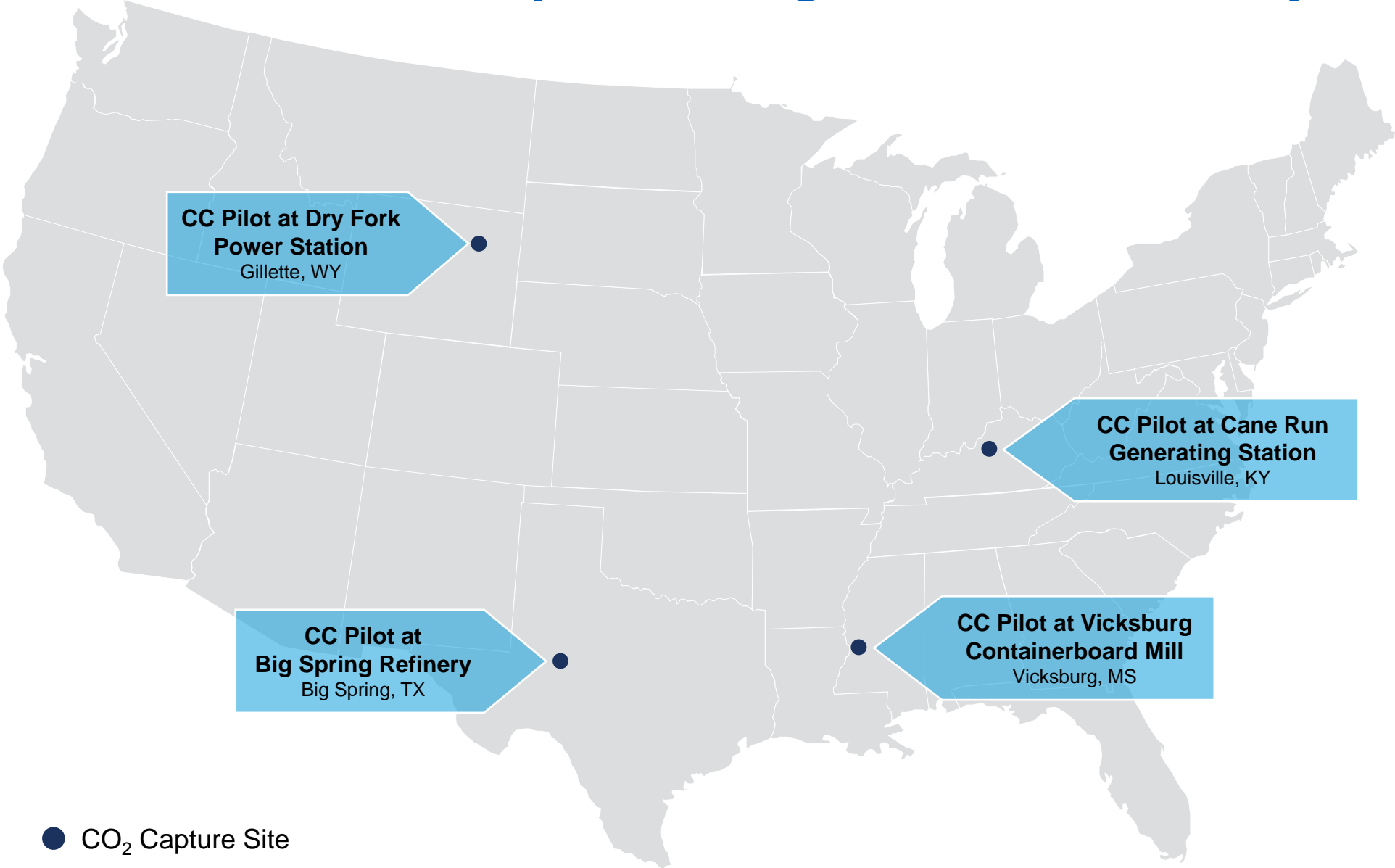
Carbon Capture Large-Scale Pilot Projects Program

Establish and test innovative carbon capture pilot projects large enough to support new processes and technology improvements at scale.

Carbon Capture Pilots Current Status

- February 2023: Announced funding opportunity for Carbon Capture Large-Scale Pilot Projects.
- May 2023: Responded to concept papers.
- July 2023: Received full applications.
- **February 2, 2024: OCED announced four projects selected for award negotiation.**
- DOE is considering another FOA for more Carbon Capture Large-Scale Pilot Projects.

Selected Carbon Capture Large-Scale Pilot Projects





Carbon Capture Pilot at Dry Fork Power Station Overview

Project Summary

- TDA and its partners will carry out a pilot-scale (≤ 23 MW) evaluation of an adsorbent-based carbon capture technology
- The project is hosted by the Wyoming Integrated Test Center (ITC) at Basin Electric's Dry Fork Station
 - Up to 158,000 tonne/year of CO_2 will be captured with $\geq 90\%$ capture efficiency
 - Produce a sequestration-ready CO_2 product ($\geq 95\%$)



Project Schedule

Phase I Detailed Plan & FEED Study	Phase II Project Development, Permitting & Financing	Phase III Procurement, Construction & Integration	Phase IV Ramp-up & Pilot Operations
18 months	12 months	24 months	24 months
<ul style="list-style-type: none"> * Final Site Review * Front End Engineering Design * Life Cycle Analysis * Community Benefit Plan 	<ul style="list-style-type: none"> * Permit Application * Project Financing * Uptake Agreements * Labor Agreements 	<ul style="list-style-type: none"> * Procurement * Construction * Tie-ins/Integration 	<ul style="list-style-type: none"> * Installation * Operation (Testing and Evaluations) * Decommissioning

- The project is organized into 4 sequential phases with go/no-go stage gates:
 - Phase 1 (18 Months) – Detailed Plan and FEED Studies
 - —*Currently in pre-award negotiations with OCED*
 - Phase 2 (≤ 12 Months) – Project Development, Permitting, and Financing
 - Phase 3 (≤ 24 Months) – Procurement, Construction, and Integration
 - Phase 4 (≤ 24 Months) – Ramp-up and Pilot Operations

Project Partners



TDA Research, Inc.

- Privately held R&D organization with 132 employees (34 PhDs)
- \$30.1 million revenue in 2023
- Focus on early stage R&D



Direct Catalytic H₂S Oxidation Technology



SulfaTrap purification products



Fullerene Manufacturing
40 ton/year in Kitakyushu, Japan



Ambient
Temperature
CO/VOC
Oxidation
Catalyst



Air Separation
Sorbent for Medical
Applications

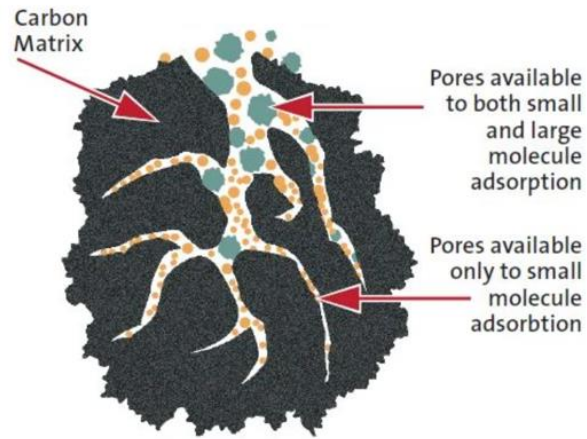


SSDX-12™ aircraft detergent



Carbon Capture Technologies

TDA's CCS Technology



- The sorbent is a modified activated carbon with surface groups that selectively remove CO₂
- Very safe to use since it is derived from sugar or other biomass (e.g., starch)
- Porous like a sponge with large pores allowing easy access of gases
- The sorbent is stored in special vessels; multiple vessels are used to run a cyclic process for continuous removal of CO₂
- No gas emissions, no water emissions, all solid waste can be safely disposed

Technology Demonstrations/Validation

- We have demonstrated the viability of the new technology at various fields tests since 2018 at the Wyoming ITC and Technology Center Mongstad, Norway at 100 kW to 1MW scale
- The objective of the overall project is to validate TDA's CCS at a larger scale (23 MW)
- In Phase I, we will complete a front-end engineering design (FEED) study for the CCS and generate a workflow for permitting and environmental review process
- Community engagement is a key component of TDA's work plan and will be included in all phases of the project



Community Benefits Plan

- TDA CBP Lead: Sara Rolfe, communitybenefits@tda.com
- Consultant: University of Wyoming's School of Energy Resources (SER)
- The CBP have four main thrusts
 - Community and Labor Engagement
 - Investing in the American Workforce
 - Diversity, Equity, Inclusion and Accessibility (DEIA)
 - Justice40 Initiative
- We will follow a methodical approach in the plan execution
- We will have established metrics for measuring the community impact (e.g., number of attendees who participated to community engagement events or the number of hires)
- The results will be shared in reports published to a website accessible by the public
 - A high level of transparency

Community and Labor Engagement

- **Goal:** Create a two-way conversation with neighboring communities, tribal groups, labor unions and workforce organizations.
- **Examples of engagement include:**
 - Community engagement event in Campbell County, WY, Q2
 - Engagement with Tribal Representatives, Q4
 - Summary report on findings from stakeholder engagement, Q8
 - Second community engagement event, Q16

Investing in the American Workforce

- **Goal:** Attract and maintain a skilled and well-qualified workforce for the design, construction and operation of the carbon capture pilot plant
- **Pilot Workforce Needs:**
 - Construction of the pilot plant - 40-60 contract jobs at the WITC locations
 - Operation of the pilot plant - 20-25 jobs in Phase 4
 - Operators will receive the training of our process and need to pass the test
 - The training cost will be covered by the project
- **Activities include:**
 - Assess workforce needs for pilot and invest, Q4
 - Engage union and/or workforce, Q10
 - Track employee retention, Q26

Diversity, Equity, Inclusion and Accessibility (DEIA)

- **Goal:** Increase the number of underrepresented STEM candidates (women, minorities, etc.) available in the labor pool.
- **Activities include:**
 - Internships, Ongoing
 - DEIA training for project members, Q4
 - Contracts with Minority-/Women-/Disadvantaged-Owned Businesses, Q8

Justice40 Initiative

- **Goal:** Ensure that benefits of federal investments flow to disadvantaged communities and that no environmental impact should negatively affect the disadvantaged community.
- **Activities include:**
 - Energy and Environmental Justice (EEJ) Assessment, Q6
 - Community Engagement, Q10

Next Steps & Resources



John Brown,
Stakeholder Engagement
Lead, Carbon Capture,
OCED

Next Steps – Negotiations

Award Negotiations: DOE OCED will begin the negotiations process with project selectees

After Award: *IF the projects receive an award (successful negotiations)*

- Awarded projects will enter into a cooperative agreement with OCED
- Phase 1: Detailed Project Planning begins
- OCED will work with the awarded project partners starting in Phase 1 to ensure compliance with the National Environmental Policy Act (NEPA)
- Local communities (state, local and community stakeholders) will have the opportunity for ongoing engagement with OCED and the awardee(s)

More broadly, DOE is exploring the use of regional frameworks to support project outcomes.



Get Involved

How could this project impact me?

Learn more about OCED's Community Benefits Plan Framework →

Is there a CC Pilots project near me?

Learn more about the selected projects here →

Project selected



★ WE ARE HERE

What is a CC Pilot?

Learn more →

Announcement and Negotiations
Projects have been selected, but awards have not been made

Project awarded



1

~18 months

NEPA engagement during phase 2 →

2

Up to 12 months

3

Phase 2: Project Development

Community Benefit Commitments Public

Phase 1: Project Planning

Community Benefit Commitments Public

Ongoing community engagement throughout each phase

Learn more about project phases →

Up to 24 months

Phase 3: Install, Integrate, Construct

Community Benefit Commitments Public

Phase 4: Ramp-Up & Operate

Community Benefit Commitments Public

4

Up to 24 months

Carbon Capture Large-Scale Pilot Projects Resources

Carbon Capture Large-Scale Pilot Projects Program

- [Program Page](#)
- [Press Release](#)
- [Overview of Selected Projects](#)
- [Local Engagement Opportunities](#)

Community Benefits

- [CBP101 Webinar](#)
- [OCED CBP Factsheet](#)
- [OCED Communities, Jobs, and Justice Page](#)

Additional Carbon Capture Resources

- [Carbon Management Pathways to Commercial Liftoff Report](#)
- [Industrial Decarbonization Pathways to Commercial Liftoff Reports](#)
- [Interactive Diagram of DOE's Carbon Management Provisions](#)



Feedback Session



Emmanuel Taylor,
Facilitator

Ground Rules for Discussion

- Submit questions using the Q&A feature.
 - You can also see and upvote other questions that have been asked.
- Reserve judgement
- One idea at a time
- It is okay to build on the ideas of others
- Clarifying questions are okay





Stay Connected

- Reach DOE OCED about this project at DryFork_CCPilot@hq.doe.gov
- OCED Website & Newsletter energy.gov/oced

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Thank you!



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