



THE OFFICE OF CLEAN ENERGY DEMONSTRATIONS



Carbon Capture Demonstrations Sutter Decarbonization Project Community Briefing

January 11, 2024

Office of Clean Energy Demonstrations

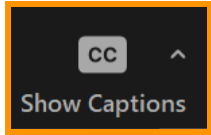
U.S. Department of Energy

Welcome & Meeting Objectives

- The Office of Clean Energy Demonstrations (OCED) at DOE recently announced the selection of three Carbon Capture Demonstration Projects, including one in Yuba City, California.
- 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?

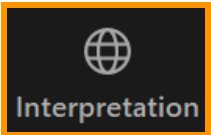


Click on the “**Show Captions**” button in the control panel at the bottom of your screen.

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 Demonstration Projects Program Overview
- Sutter Decarbonization Project Overview
- Next Steps & Resources
- Feedback Session
- Wrap-up & Close



OCED Overview



Lydia Kubiak-Cardona,
Community Engagement
Specialist, 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.

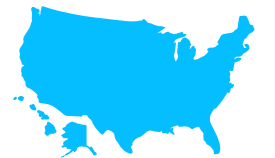
Community & Labor Engagement



Diversity, Equity, Inclusion, & Accessibility



Investing in the American Workforce



Justice40 Initiative



Carbon Capture Demonstration Projects



Todd Shrader,
Deputy Director, Project
Management, OCED

How Does Carbon Capture and Storage (CCS) Work?

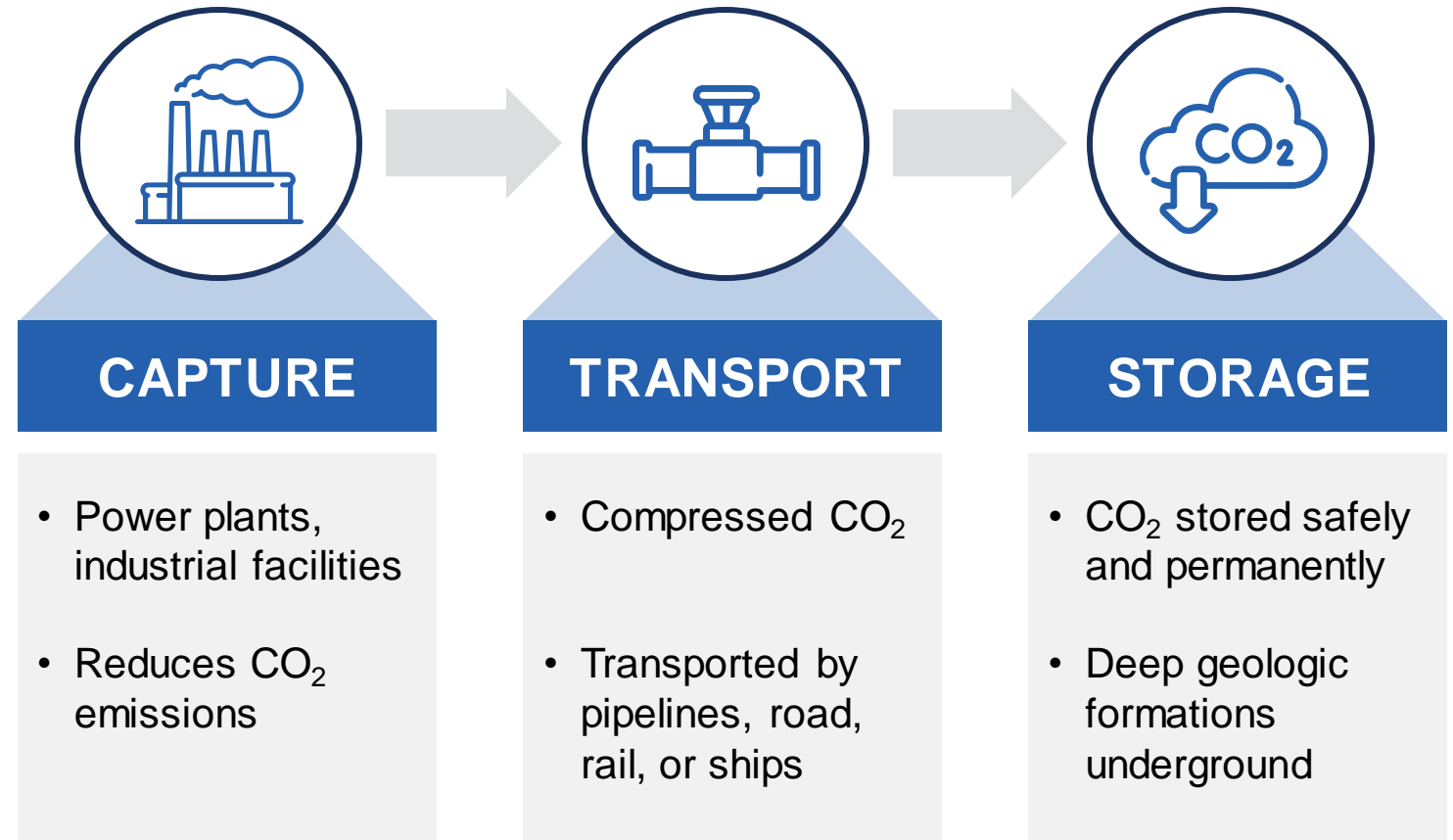
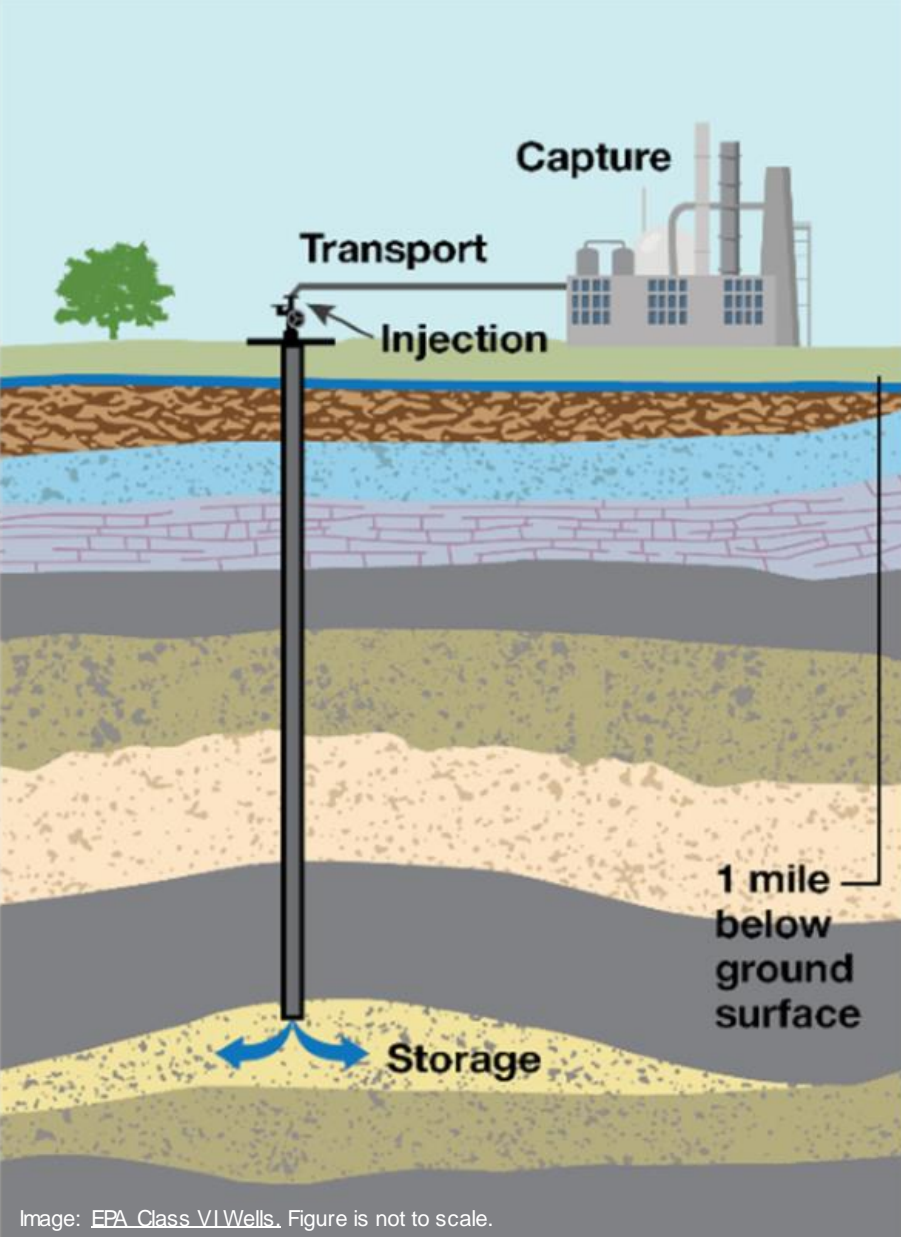
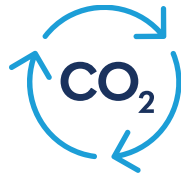


Image: EPA Class VI Wells. Figure is not to scale.

Deploying CCS 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 Demonstration Projects Program

Develop six carbon capture facilities to significantly improve costs, emissions reductions, and environmental effects of coal and natural gas use.

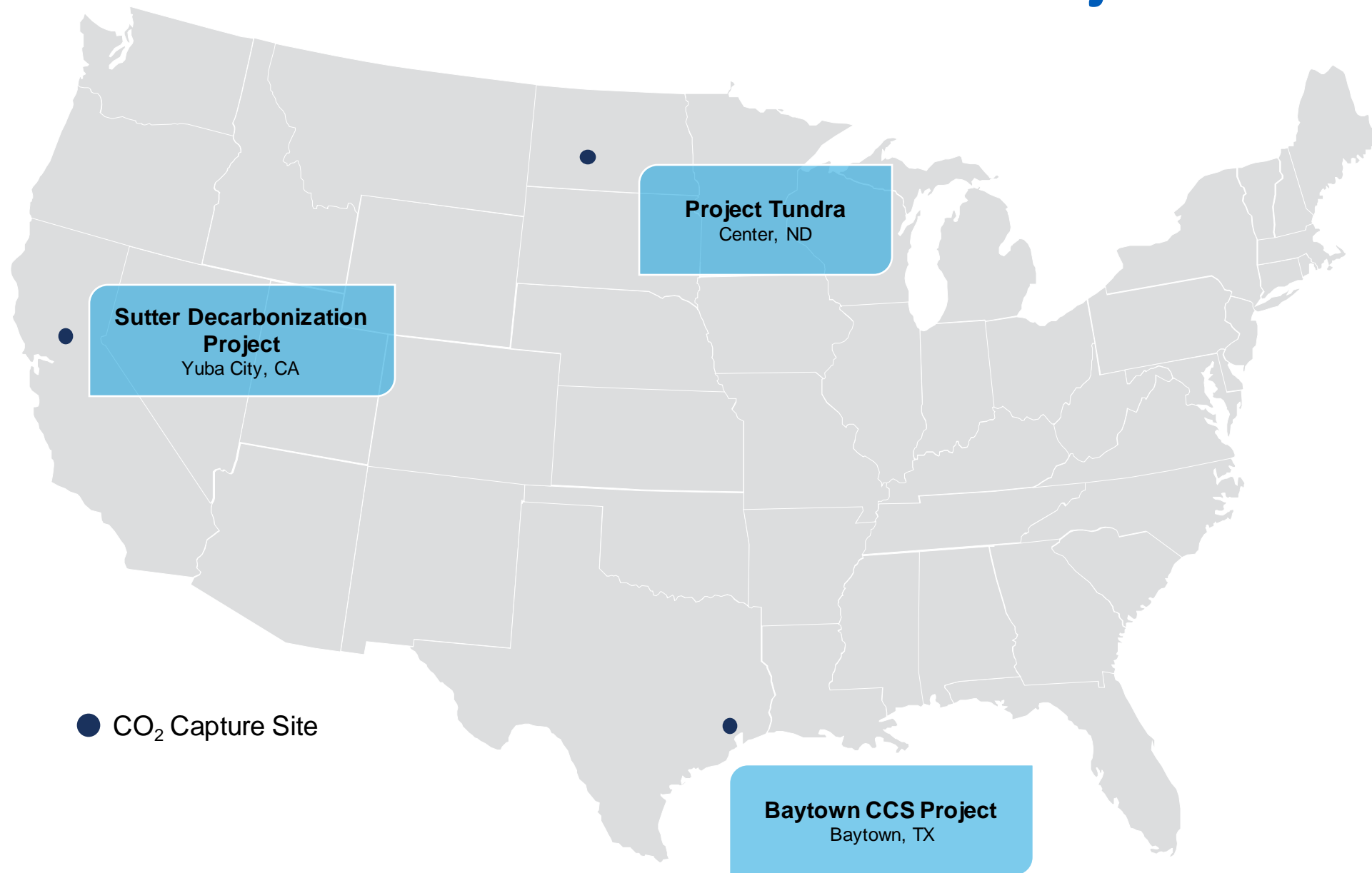
CCS Demonstrations Current Status

- February 2023: Announced funding opportunity for CCS Demonstration Projects.
- May 2023: Received full applications.
- **December 14, 2023: OCED announced three projects selected for award negotiation.**
- DOE anticipates future FOAs for CCS Demonstrations.

Carbon Capture FEED Studies Current Status

- May 2023: Selected nine FEED study projects for award negotiation.
- September 2023: Awarded two FEED study projects.
- December 2023: Awarded four FEED study projects.
- *Other FEED study selectees are still in negotiations.*

Selected CCS Demonstration Projects





Sutter Decarbonization Project Overview



America's Premier Competitive Power Company
... Creating Power for a Sustainable Future

Sutter Decarbonization Project

Community Briefing

January 11, 2024

TODAY'S DISCUSSION

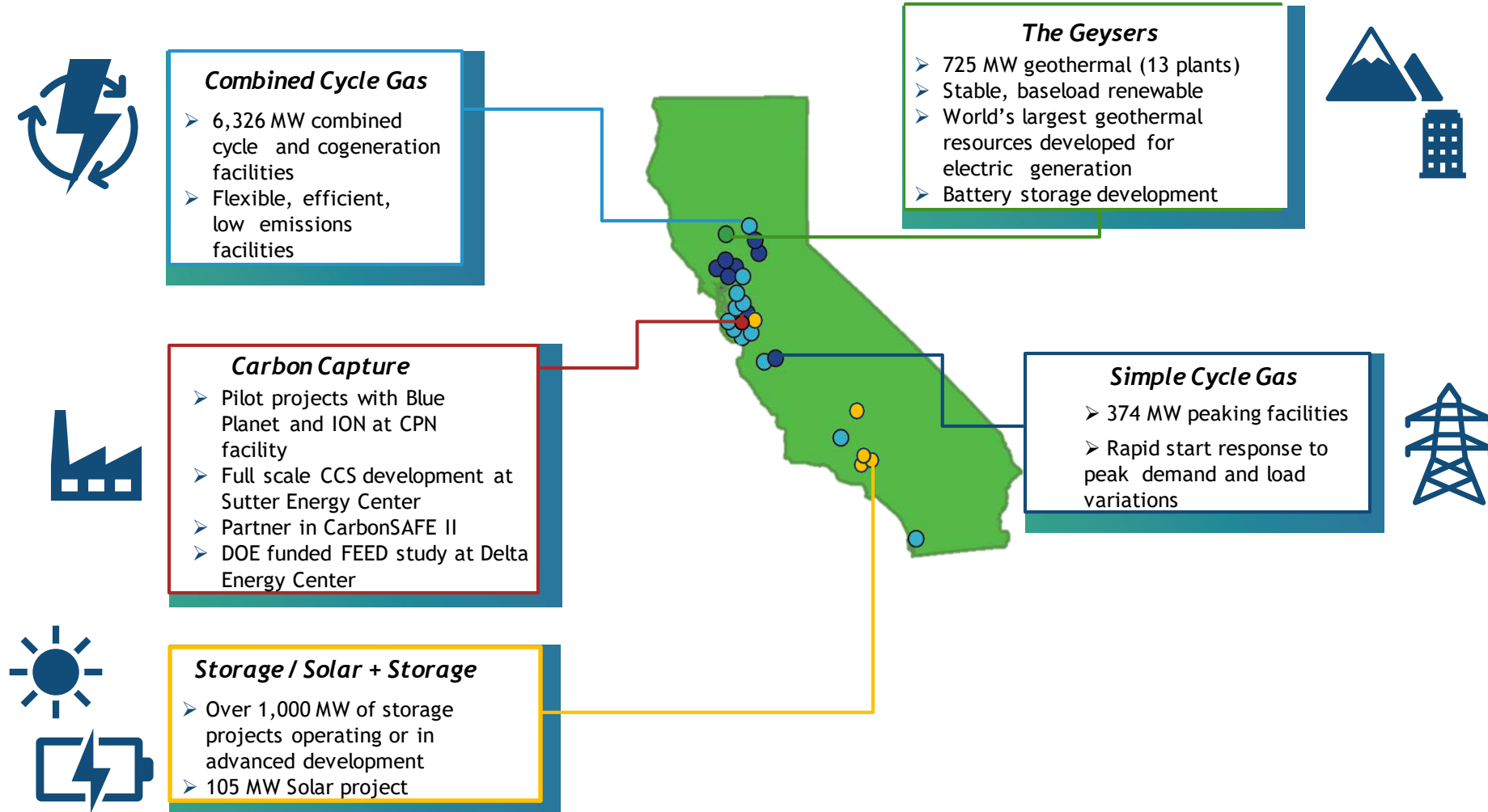
Sutter Decarbonization Project

- Overview
- Technology
- Transportation & Storage
- Community Benefits Plan



Calpine in California

Calpine owns and operates 7,425 MW in the West



Excluded from image: CCGTs in Oregon and Arizona

Sutter Decarbonization Project

- Post-combustion carbon capture system for full 2X1 output
- Captures up to 1.75 million metric tonnes per year at baseload operation
- 95% CO₂ capture efficiency
- First in the world air-cooled capture facility
- Upgrades to existing facility to increase efficiency
- Provides significant investment opportunity for region
- SMUD to be off taker for low carbon generation
- The project will be constructed under a Project Labor Agreement with the State Building and Construction Trades



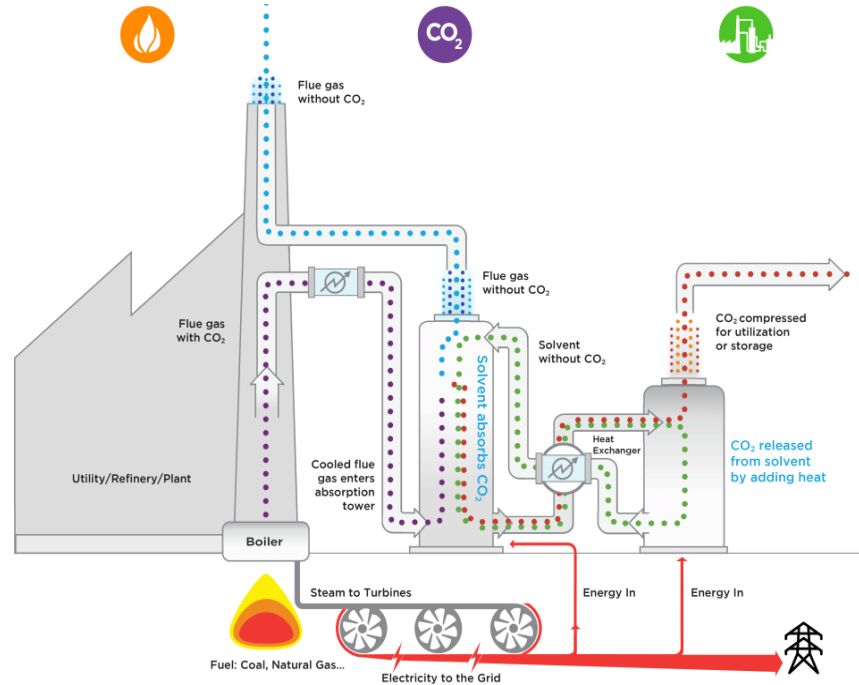
*Highly efficient ~550 MW natural gas
combined cycle power plant*

Located near Yuba City in Sutter County

Commercially operational July 2001

*First Air Cooled, Zero Liquid Discharge Plant
in California*

ION Clean Energy Carbon Capture Technology



- The CO₂ from the flue gas is absorbed in an Amine based solution.
- The CO₂ stream is then separated from the solvent in the stripper.
- The solvent is recirculated back to the absorber.



Enterprise Pilot at Los Medanos Energy Center



ION Clean Energy optimizes a technology that has been deployed for more than 100 years to make significant improvements

Transportation

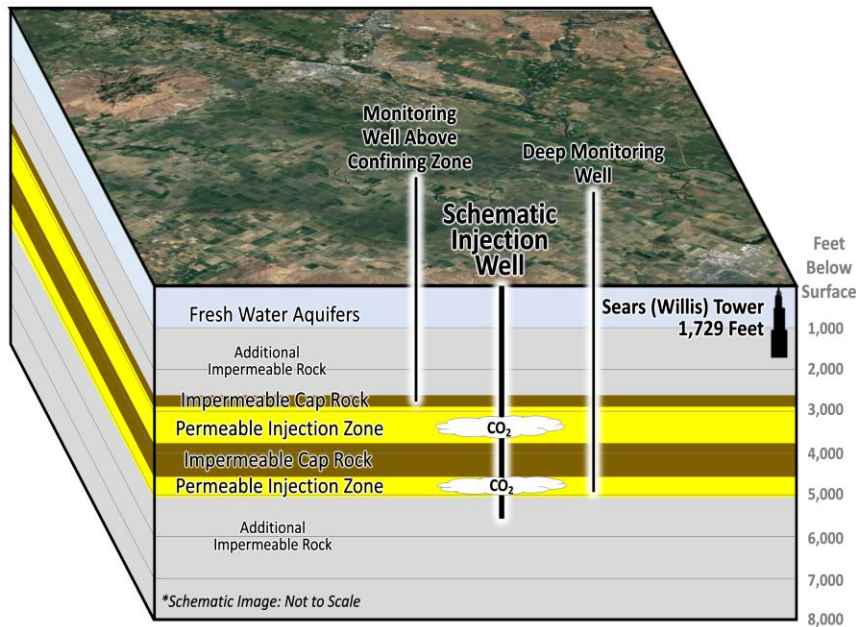
Pipeline Route Development

- CO₂ pipeline route leverages existing Calpine natural gas rights-of-way
- Pipeline is designed in anticipation of new PHMSA pipeline regulatory requirements
- Conducted outreach to local emergency responders to address training and response



Safe Storage

- Optimal storage location and capacity verified by 3 independent engineering evaluations including LLNL
- Storage location 10 miles southwest of Sutter
- Close to existing pipeline infrastructure



- Safely stores over 20 MMT of CO2 annually
- Storage systems developed with failsafe, redundancy, and monitoring
- 50 years of experience and 0 safety incidents
- Actively engaged in the community through a CarbonSAFE award and leveraging those learnings for the Sutter Decarbonization Project

Community Benefits Plan Overview

Community & Labor Engagement

- Charitable contributions
- 50+ small community meetings
- Multiple public workshops in the impacted communities
- **Project Labor Agreement** negotiations
- Workforce drawn from region
- Engineering design changes based on community feedback



Diversity, Equity, Inclusion, & Accessibility

- Expanded relationships with minority-serving institutions and organizations supporting underserved populations
- Diverse supplier spend target

Investing in America's Workforce

- Construction **Project Labor Agreement**
- Multidisciplinary internship program in response to articulated needs
- Continued co-op and training programs with regional community colleges

Implementing Justice40

- Data sharing protocol and publicly available impact database
- **Verification and validation** by third party (Lawrence Livermore National Laboratory)
- Investment prioritization plan

Public Power Partner



- Sixth-largest community-owned, not-for-profit electric service provider
- Providing low-cost, reliable electricity to Sacramento County for more than 75 years
- Home to several low-income and overburdened communities facing economic challenges
- Through extensive stakeholder engagement SMUD's publicly-elected board has responded to community concerns through the creation of the 2030 Zero Carbon Plan



SMUD is both the electricity off taker & a partner in community engagement

Community Benefits Plan Status



- Community Outreach: Ongoing
- Supplier Tracking: Ongoing
- Project Labor Agreement Negotiations: Ongoing
- Community Benefit Agreement: Phase 2 onwards
- Workforce Development Program: Phase 1 onwards
- Impact Database Development: Phase 2



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 →

Is there a Carbon Capture Demonstration
project near me?

Learn more about the
selected projects here →

Project
selected



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

What is a CC
Demo project?

Learn more →

Project
awarded



When are the CC Demos
project-specific briefings?

Learn more and
register here →

1

~12-18 months

2

~2-3 years

3

~3-6 years

4

~2-4 years

Phase 1: Detailed Plan

Community Benefit Commitments Public

Phase 2: Project Development

Community Benefit Commitments Public

Phase 3: Install, Integrate, Construct

Community Benefit Commitments Public

Phase 4: Ramp-Up & Operate

Community Benefit Commitments Public

Ongoing community engagement
throughout each phase

How do I stay informed?

Sign up for updates →



OCED
Office of Clean Energy Demonstrations



Community Benefit Commitments Public



Go/No-Go Decisions

CCS Demonstration Projects Resources

Carbon Capture Demonstration Projects Program

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

Additional Carbon Capture Resources

- [Carbon Management Pathways to Commercial Liftoff Report](#)
- [Interactive Diagram of DOE's Carbon Management Provisions](#)
- [EPA Class VI Wells Information](#)

Community Benefits

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



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 Sutter_CCS@hq.doe.gov
- OCED Website & Newsletter energy.gov/oced

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Thank you!



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