



# Carbon Utilization and Storage Partnership

What is the Carbon Utilization and Storage Partnership (CUSP)? CUSP is a Department of Energy-funded Regional Initiative established to accelerate onshore CCUS technology deployment in the Western Region of the United States. The CUSP project is a research consortium of all or parts of 13 states, consisting of organizations throughout the western United States including academia, government agencies, national laboratories, and industry.

## CO<sub>2</sub> CAPTURE

Large (>25,000 metric tons), stationary emission sources (power plants, cement factories, ethanol plants, etc.) are fitted with special hardware to capture and concentrate produced CO<sub>2</sub>, where it is then transported to a site for utilization and/or storage.

## CO<sub>2</sub> TRANSPORT

Captured and concentrated liquid phase CO<sub>2</sub> is gathered for conveyance to a long-term storage site. The most economical form of CO<sub>2</sub> transport is by pipeline. For new capture-to-storage sites, CO<sub>2</sub> pipelines must be constructed along rights-of-way, often requiring significant legal and regulatory negotiations.

## CO<sub>2</sub> STORAGE

Captured liquid phase CO<sub>2</sub> is transported to a utilization or storage site via pipeline. The CO<sub>2</sub> is injected into deep geologic formations. Over time, the injected CO<sub>2</sub> will migrate away from the injection site, but will be confined vertically by low permeability confining geologic formations. The Western USA has significant storage capability for CO<sub>2</sub> within saline aquifers and oil/gas formations.

## The Main Objectives of the CUSP Initiative

- Addressing Key Technical Challenges

The project will expand the understanding of storage in stacked and unconventional formations with emphasis on optimizing storage and reducing uncertainty.

- Facilitating Data Collection, Sharing, and Analysis

The project will consolidate and update the disparate and outdated datasets to improve the understanding of CO<sub>2</sub> injection, containment and economic feasibility.

- Evaluating Regional Infrastructure

The project will evaluate the requirements of a transportation network needed to deliver the captured CO<sub>2</sub> from the sources to the utilization and storage sites.

- Promoting Regional Technology Transfer

The project will engage, inform and educate CCUS stakeholders to facilitate technology transfer and the advancement of CCUS projects in the region.



# Promoting CCUS in the Western US

The CUSP member states represent a significant body of CCUS-related experience in the fields of:

- Site selection
- Geologic/hydrocarbon characterization
- Reservoir modeling
- Computer simulation
- Scenario development
- CO<sub>2</sub> & site monitoring
- Risk & uncertainty analysis
- Economics
- Stakeholder outreach & engagement
- Regulatory & policy assessment

The goal of the partnership is to utilize our combined knowledge to assist industrial operators and other stakeholders in the region in their efforts to safely, securely and economically capture and store CO<sub>2</sub>.

To achieve this goal, the CUSP team continues to develop synergies with industries and organizations affiliated with the energy and environmental sectors. One key outcome of these relationships is the sharing of data that will be used to develop scenarios for economically-achievable CCUS projects and to assess the readiness of entire Western USA for large-scale CCUS. Data from the various stakeholders will be compiled into a common CCUS database that can be accessed by interested parties to assess a variety of site-specific CCUS criteria and scenarios.

The project team and regional stakeholders will leverage the CUSP CCUS Database and the SimCCS platform to aid the decision-making process by evaluating capture sites, storage complexes and candidate transportation routes to optimize and determine the most cost-effective CCUS system design.



The CUSP team is already assisting a gas production company in the Permian Basin of New Mexico with 45Q planning and development strategies. Lucid Energy will be capturing and injecting the CO<sub>2</sub> (and H<sub>2</sub>S) waste stream co-produced with natural gas at their Red Hills facility to acquire the 45Q tax credits. Lucid Energy's CCUS program will be used as a model for similar 45Q projects in the CUSP region, with emphasis on Kansas, Oklahoma and Texas.

For more information, Contact:

The Carbon Utilization and Storage Partnership (CUSP)

<https://www.cuspwest.org/contact>

[info@cuspwest.org](mailto:info@cuspwest.org) (please tell us what your interests are)

## 45Q Tax Credit

Section 45Q of the US Tax Code provides a credit for every ton of captured CO<sub>2</sub> for secure geological storage. In 2018, Congress passed legislation as part of the FUTURE Act to increase the incentives for the capture and storage of CO<sub>2</sub>. This tax credit for CCUS, generally known as 45Q, applies to two approaches for the geological storage of CO<sub>2</sub>: enhanced oil recovery (EOR) and deep saline aquifers. For qualifying capture facilities, the 45Q program allows for tax credits of \$35 per metric ton of CO<sub>2</sub> for EOR and \$50 per metric ton of CO<sub>2</sub> for deep saline storage.

Operators that pursue geological storage of CO<sub>2</sub> under 45Q are subject to the EPA's Greenhouse Gas Reporting Program (GHGRP) requirements, which mandates CO<sub>2</sub> accounting /reporting and site-specific monitoring for any potential leakage. A Monitoring, Reporting, and Verification (MRV) Plan must be developed for each site and approved by the EPA. MRV planning and implementation, and general 45Q guidance, are valuable services that the CUSP states can provide to interested parties within the region.