



the **ENERGY** lab

PROJECT FACTS

Carbon Storage - Training Center

Carbon Capture and Storage in the Permian Basin, a Regional Technology Transfer and Training Program

Background

Carbon capture, utilization, and storage (CCUS) technologies offer great potential for mitigating carbon dioxide (CO₂) emissions emitted into the atmosphere without adversely influencing energy use or hindering economic growth. Deploying these technologies in commercial-scale applications will require a drastically expanded workforce trained in CCUS related disciplines, including geologists, engineers, scientists, and technicians. Training to enhance the existing CCUS workforce and to develop new professionals can be accomplished through focused educational initiatives in the CCUS technology area. Key educational topics include simulation and risk assessment; monitoring, verification, and accounting (MVA); geology-related analytical tools; site characterization, methods to interpret geophysical models; methods for designing and completing CO₂ injection and monitoring wells; and methods for conducting public outreach activities in areas where CCUS projects may occur.

The U.S. Department of Energy's (DOE) National Energy Technology Laboratory (NETL) selected seven projects to receive more than \$8.4 million in funding to develop regional carbon storage technology training centers in the United States. The majority of this funding is provided by the American Recovery and Reinvestment Act (ARRA) of 2009. The seven projects are facilitating the transfer of knowledge and skills required for development, operation, and monitoring of commercial CCUS projects. Training activities are focusing on the applied engineering and science of CCUS for site developers, geologists, scientists, engineers, regulators and technicians to provide a technology transfer platform for geologic CO₂ storage activities. The awarded projects will produce a workforce with both technical and non-technical skills and competencies needed to successfully implement and deploy CCUS technologies.

Project Description

NETL, in partnership with the Petroleum Technology Transfer Council (PTTC), the American Association of Petroleum Geologists, and the Applied Petroleum Technology Academy has developed a regional sequestration technology training center to deliver CCUS technology training and information to stakeholders in the Permian Basin Region of western Texas and southeastern New Mexico through an established technology transfer network, online capabilities, and a communications

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PARTNERS

American Association of Petroleum Geologists
Applied Petroleum Technology Academy

PROJECT DURATION

Start Date

11/16/2009

End Date

9/30/2013

NATIONAL ENERGY TECHNOLOGY LABORATORY

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Website: www.netl.doe.gov

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U.S. DEPARTMENT OF
ENERGY

COST

Total Project Value

\$1,253,006

DOE/Non-DOE Share

\$994,998/\$258,008

Government funding for this project is provided in whole or in part through the American Recovery and Reinvestment Act.



program. The Permian Basin is an ideal target for this type of training since it is a major oil and gas producing region, contains oil fields that show promise for CO₂-enhanced oil recovery (EOR) and carbon storage activities, and has an extensive CO₂-EOR infrastructure already located throughout the region.

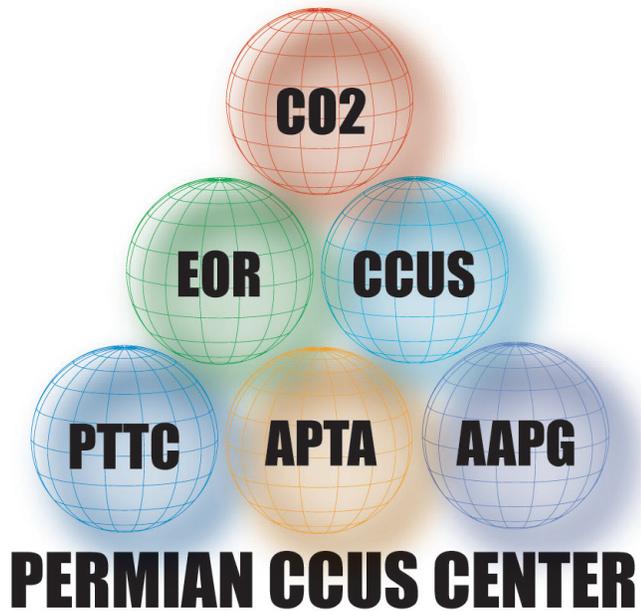
To implement this project, PTTC has created courses and lecture materials for academia and industry related to CCUS and conduct annual training events geared toward universities and colleges. PTTC is utilizing multiple approaches to deliver its technology transfer and training programs, including regional workshops, presentations at technical meetings, a focused research-oriented workshop, an online certificate program, webinars/e-symposia, and communication through newsletters, email tech alerts, and a website located at <http://www.permianbasinccs.org/>.

Goals/Objectives

The primary objective of the DOE's Carbon Storage Program is to develop technologies to safely and permanently store CO₂ and reduce Greenhouse Gas (GHG) emissions without adversely affecting energy use or hindering economic growth. The Programmatic goals of Carbon Storage research are: (1) estimating CO₂ storage capacity in geologic formations; (2) demonstrating that 99 percent of injected CO₂ remains in the injection zone(s); (3) improving efficiency of storage operations; and (4) developing Best Practices Manuals (BPMs).

The goal of this project is to advance the United States as the technology leader for addressing climate change and for developing near-zero emission technologies to significantly reduce CO₂ emissions from utility, and industrial plants. It will achieve this goal by providing ample training, educational opportunities, and insight into best practices to develop a new generation of workers capable of conducting research required to advance CCUS technology. The primary objectives of this project are to transfer CCUS technology information by:

- Providing world-class technology transfer, training, and CCUS expertise by offering basic training and instructional materials to CCUS stakeholders in the Permian Basin region.
- Delivering the training and communications program efficiently through an established technology transfer network with online capabilities, thus making it accessible to a national and global audience.
- Creating materials and content to stimulate workforce development and technology adoption, thus addressing primary obstacles to rapid CCUS deployment.
- Developing a self-sustaining CCUS training program through an active sponsorship program and appropriately priced user fees.



Accomplishments

- As of March 2012, a total of 1,230 Professional Development Hours (PDHs) have been obtained and over 668 students have participated in CCUS training.
- Recent courses provided by the PTTC included a two-hour mini short course on the business model behind carbon capture and CO₂ flooding, an overview of understanding reservoir characterization, modeling, and monitoring based on lessons learned from the Permian Basin EOR operations, an overview presentation to the Texas Railroad Commission on the elements of CCUS and EOR, and graduate school seminars introducing the CCUS industry.
- The program created the following series of four CCUS WebEx Meetings: (1) An Overview of Carbon Capture & Storage and CO₂ Enhanced Oil Recovery; (2) The Reservoir - Characterization, Modeling and Monitoring; (3) CO₂ Sources, Marketing, Legal and Regulatory; (4) CO₂ Capture, Transportation and Operations.
- PTTC faculty have attended numerous national conferences to give lectures and presentations on CCUS-related projects.
- The catalog of upcoming courses, meetings, and conferences associated with the PTTC is available at <http://www.permianbasinccs.org/events.htm>

Benefits

The overall benefit of this project is a developed and trained workforce well versed in CCUS best practices that can accelerate implementation and deployment of CCUS projects. Training provided by the PTTC will install the necessary skill sets to enable companies and individuals to seize CCUS-related opportunities. An added benefit of having a knowledgeable CCUS workforce in this area is that a significant portion of the captured CO₂ within the Permian Basin region can be applied to enhanced oil recovery to increase domestic oil production and reserves.

