



the **ENERGY** lab

PROJECT FACTS

Carbon Storage - Training Center

Carbon Capture and Storage Training

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 Environmental Outreach and Stewardship (EOS) Alliance, Pacific Northwest National Laboratory (PNNL), has developed a regional carbon storage technology training center to deliver CCUS technology training and information to stakeholders in the Pacific Northwest. This training center provides a platform for geologic CO₂ storage related technology information, establishing an advisory board, offering a suite of revenue-generating training classes, and implementing a marketing strategy for prospective students with the goal of the center to become self-sustaining within three years.

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PARTNERS

Pacific Northwest National Laboratory

PROJECT DURATION

Start Date

11/16/2009

End Date

11/15/2012

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

\$995,000

DOE/Non-DOE Share

\$995,000/\$0



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

EOS Alliance and partners have developed short courses on various aspects of CCUS technology. Instructors for these courses come from PNNL, academia, industry, and other national laboratories. The course offerings focus on technologies (Figure 1) and issues relating to the U.S. Pacific Northwest region, and include lectures on CCUS technologies, several multiple-day combined courses that integrate technical topics, and tours of facilities conducting cutting edge geologic CO₂ storage research. EOS Alliance is working to register the CCUS courses for Professional Development Units (PDUs) and is evaluating the feasibility of establishing a certification program.

EOS Alliance will take the lead in planning and managing this program. In partnership with PNNL

and the EOS Alliance will coordinate and monitor the regional CCUS training project performance, maintain sufficient project management staff, support the Advisory Board, implement strategic planning, work with other regional carbon storage technology training recipients, create and provide all deliverables to DOE, and maintain appropriate fiscal and accounting systems. Additional information can be found at <http://www.carbontechalliance.org/>



Figure 1: EOS Logo

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 primary goal of this project is to focus training efforts on the applied engineering and science of CCUS for site developers, geologists, engineers, and technicians, and facilitate technology transfer of CO₂ storage related technology information, with a particular emphasis on technologies relevant to the Pacific Northwest. The EOS Alliance will serve to generate early interest and increase the number of workers available to the CCUS industry by developing and implementing academic programs, specialized classes, continuing education, professional development, and public awareness in order to share best-practices for CCUS operations.

Accomplishments

- As of March 2012, a total of 180 Professional Development Hours (PDHs) have been obtained and 15 students have participated in CCUS training.
- The program has developed a course called Fundamentals of CO₂ Capture and Storage that is designed to educate students on the general aspects of CCUS including site selection/characterization, regulatory requirements, monitoring, verification, and accounting, public/stakeholder perception and acceptance, and current CCUS projects. The course is offered periodically throughout the year. The EOS Alliance has also held a symposium entitled "The Role of CO₂ Capture and Storage, and Challenges in Policy Making" and is planning a 2-day workshop entitled "Fundamentals of CO₂ Capture and Storage-Live" to be held in July 2012.
- The program has developed a series of lectures that cover CCUS-related topics including site selection and characterization, monitoring, geochemical impacts, numerical simulation, well drilling, and reservoir engineering. The full suite of courses offered by the EOA Alliance can be located at <http://www.carbontechalliance.org/schedule/calendar/courses>

Benefits

The primary benefit of this project is to expand the U.S. CO₂ carbon storage workforce by transferring knowledge, skills, and best practices required for site selection, development, operations, and monitoring of commercial CCUS facilities. An additional regional benefit includes the program's proximity to the basalt CO₂ carbon storage pilot in eastern Washington, which will provide students with a direct examination of CCUS by providing them with first-hand experience related to a basalt CCUS project site.

