



the **ENERGY** lab

PROJECT FACTS

Carbon Storage - Training Center

Development and Implementation of the Midwest Geological Sequestration Consortium Sequestration Training and Education Program (STEP)

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.

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PARTNERS

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PROJECT DURATION

Start Date

11/16/2009

End Date

11/16/2011

NATIONAL ENERGY TECHNOLOGY LABORATORY

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U.S. DEPARTMENT OF
ENERGY

COST

Total Project Value
\$1,093,617

DOE/Non-DOE Share
\$994,991/ \$98,626



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

Project Description

NETL, in partnership with the Illinois State Geological Survey (ISGS) and the Midwest Geologic Sequestration Consortium (MGSC), has developed the MGSC Sequestration Training and Education Program (STEP) to disseminate CCUS technology and provide education and training opportunities for engineers, geologists, service providers, regulators, executives, and other CCUS personnel working within the Illinois Basin region of the United States.

This project has researched and developed topics for course development, is creating an organized sponsorship program, is conducting short courses and conferences, and has developed CCUS-related instructional materials. The Midwest Geological Sequestration Consortium (MGSC) is working with CCUS experts to develop course materials, lectures, and curriculum for modular training events, and publishes a quarterly newsletter, created a training website, produced e-mail tech alerts, and established a response system for technical inquiries. The STEP program is working toward self-sustainability and will continue to provide training courses with the assistance of an organized sponsorship program and fees collected during the project period. The marketing strategy is being deployed through the website, the electronic newsletters, and trade show participation. More information related to STEP can be found at <http://www.sequestration.org/step>

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 for MGSC and ISGS to create a self-sustainable STEP program for disseminating CCUS technology, knowledge, and best practices information. Its objective is to provide CCUS education and career opportunities for engineers, geologists, service providers, regulators, executives, and other personnel (Figures 1, 2, and 3) to expand the CCUS workforce in the Illinois Basin region.



Figure 1: STEP training courses will bring together CCUS experts, engineers, geologists, communications specialists, and trades for knowledge sharing and training in carbon storage.



Figure 2: STEP will draw on experts with CCUS project experience to provide training and education throughout the Midwest United States.

Accomplishments

- As of March 2012, over 488 students have participated in CCUS training, earning a total of 475 Professional Development Hours (PDHs) and 560 Continuing Education Units (CEUs).
- The STEP program has developed a lecture series on topics related to carbon capture, storage and utilization for staff and visitors at the Illinois State Geological Survey. Lectures are on topics related to CCUS and include EPA underground injection control Class VI regulations, potential CO₂ reservoirs and seals, ongoing national and international CO₂ injection projects, climate change, a short-course on the principals of geologic storage, and geologic considerations for CO₂ storage. Upcoming events, lectures, and workshops can be found at <http://www.sequestration.org/step/events/index.html>
- The STEP program has held an international carbon capture and storage summer school led by experts from the International Energy Agency Greenhouse Gas Research and Development Programme (IEAGHG). The school lasted for one week and included presentations and discussion groups led by CCUS experts.



Figure 3: STEP will develop opportunities for parties interested in CCUS to visit on-going carbon storage projects and facilitate the exchange of knowledge while providing training and job-development.

Benefits

The overall project benefit will be a trained workforce that can accelerate implementation and deployment of carbon storage by increasing the quantity and decreasing the cost of CCUS. STEP will allow for sharing new climate mitigation technology as it is developed, dramatically reducing the time it takes for innovations in research to produce positive global change. Further benefits will result from partnerships between STEP, independent research entities, utilities, CO₂ producers, and technology providers to develop carbon capture and storage technology training and job development opportunities.

