



## the **ENERGY** lab

### PROJECT FACTS

# The Southeast Regional CO<sub>2</sub> Sequestration Technology Training Program

## Background

The overall goal of the Department of Energy's (DOE) Carbon Storage Program is to develop and advance technologies that will significantly improve the effectiveness of geologic carbon storage, reduce the cost of implementation, and prepare for widespread commercial deployment between 2020 and 2030. Research conducted to develop these technologies will ensure safe and permanent storage of carbon dioxide (CO<sub>2</sub>) to reduce greenhouse gas (GHG) emissions without adversely affecting energy use or hindering economic growth.

Geologic carbon storage involves the injection of CO<sub>2</sub> into underground formations that have the ability to securely contain the CO<sub>2</sub> permanently. Technologies being developed for geologic carbon storage are focused on five storage types: oil and gas reservoirs, saline formations, unmineable coal seams, basalts, and organic-rich shales. These technologies will work towards meeting carbon storage programmatic goals of (1) estimating CO<sub>2</sub> storage capacity +/- 30 percent in geologic formations; (2) ensuring 99 percent storage permanence; (3) improving efficiency of storage operations; and (4) developing Best Practices Manuals. Deploying these technologies in commercial-scale applications will require a drastically expanded workforce trained in carbon capture and storage (CCS)-related disciplines, including geologists, engineers, scientists, and technicians. Training to enhance the existing CCS workforce and to develop new professionals can be accomplished through focused educational initiatives in the CCS technology area.

The U.S. Department of Energy's (DOE) National Energy Technology Laboratory (NETL), through funding provided by the American Recovery and Reinvestment Act (ARRA) of 2009, 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 seven projects are facilitating the transfer of knowledge and skills required for development, operation, and monitoring of commercial CCS projects. Training activities are focusing on the applied engineering and science of CCS for site developers, geologists, scientists, engineers, regulators, and technicians to provide a technology transfer platform for geologic CO<sub>2</sub> storage activities. These training centers help meet the DOE Carbon Storage Program's goal of developing CCS infrastructure in the United States.

Carbon Storage –  
ARRA - Training Center

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U.S. DEPARTMENT OF  
**ENERGY**

## PROJECT DURATION

**Start Date**      **End Date**  
11/16/2009      11/15/2012

## COST

### Total Project Value

\$1,161,494

### DOE/Non-DOE Share

\$994,368/\$167,126



## PROJECT NUMBER

DE-FE0001930

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

## Project Description

NETL partnered with the Southern States Energy Board (SSEB) and others from both industry and academia to develop the Southeast Regional CO<sub>2</sub> Sequestration Training Program (SECARB-Ed) for the southern United States. These partners have established a CCS regional training program to facilitate national and global deployment of CCS technology. The project performed a series of tasks over a three-year period. Major project tasks included:

- Initiating and implementing a Sponsorship Development Program that allows SECARB-Ed to be self-sustaining after the initial three-year period by establishing an advisory board, developing a strategy for revenue generation, and marketing.
- Establishing a CCS technology curriculum by identifying topics for short courses, positioning SECARB-Ed to take advantage of opportunities to showcase its capabilities, and seeking technical societies' approval of the training materials.
- Facilitating technology transfer through the utilization of electronic and printed media.
- Supporting research and outreach/education goals of the Southeast Regional Carbon Sequestration Partnership (SECARB).

Additional information on SECARB-Ed can be found at <http://www.secarb-ed.org/>

## Goals/Objectives

The goal of this project was to advance the United States in its position as the leader in the development and deployment of CCS technologies. The project objective was to transfer the knowledge and best practices required to enable commercial professionals to implement and deploy CCS projects in the United States. The training was designed for site developers, geologists, engineers, scientists, and technicians but was made available to others as well. Specific CCS project areas addressed were site development, operations, and the monitoring of commercial CCS projects. Knowledge and technology transfer took place through the creation of a CCS technology curriculum.

## Accomplishments

- As of the completion of this project, a total of 1,951 Professional Development Hours (PDHs) have been awarded to 1,131 participants (Figure 1).
- An Advisory Board consisting of key personnel from each SECARB-Ed participating organization was created to provide direction for the business model and to guide the development of high quality training materials and an effective outreach and education program. The board created and implemented both a Technology Training Plan and a Sponsorship and Marketing Plan (SMP).
- Twenty training events (short courses/workshops), including two flagship events, were developed and conducted at various venues. The American Institute of Chemical Engineers (AIChE) online library maintains one of the CCS webinar products, which is accessed periodically on a pay-for-use basis.

- The program has developed an on-demand webinar designed to transfer knowledge that will enable engineering professionals to implement and deploy CCS projects. Areas addressed include project development, operations, and monitoring. It provides an overview of the entire value chain of CCS from capture and separation, through CO<sub>2</sub> compression and transportation, to injection well design, utilization of CO<sub>2</sub> for enhanced oil/gas recovery, operation, and MVA techniques.
- SECARB-Ed will continue its website, Facebook page, Training Newsletters and E-alerts under the DOE Office of CleanCoal and its Office of Clean Energy Collaboration. SECARB-Ed will also develop and hold training events, as well as organize, prioritize and participate in CCS events, such as lectures, seminars, workshops and conferences in the region.
- The project hosts the Research Experience Carbon Sequestration (RECS), an intensive 10-day program that combines classroom instruction with field activities at a geologic storage test site and visits to power plants and coal mines. RECS advances education, scientific research, professional training, and career networks for graduate students and young professionals in the CCS field. More information on RECS can be found at <http://www.recscsco2.org/>
- A final report has been completed and is now available.

### CEU/PDU Award Status

Course Name	Date of Course	Number of Participants	Number of CEU or PDHs per Course	Total Number of CEU or PDHs
Carbon Capture and Storage – The Way Ahead at 2010 Spring Meeting of the Central Appalachian Section of SME	05/07/10	80	0.75	60
Clean Coal Technologies Session at the Eastern Coal Council's 31st Annual Conference and Exposition	05/25/10	68	2.50	170
Carbon Capture and Storage Fundamentals and Best Practices – Short Course; Central Appalachian Section of the Society of Mining, Metallurgy and Exploration Meeting	10/15/10	20	4.00	80
The Role of Carbon Capture and Storage in Rejuvenating the Energy Portfolio of the Southeastern United States	01/11/11	24	6.00	144
Coal and Energy: Carbon Sequestration	03/02/11	36	2.00	72
CCS Technologies and Applications across the Southeast	03/09/11	54	3.00	162
CCS Projects in the Southeast	03/10/11	60	0.00	0
CO2 Sequestration for EPA Regulators: webinar	03/18/11	65	5.00	325
Introduction to Carbon Sequestration	04/07/11	16	3.00	48
CCS Capacity Building Workshop	5/10-5/11/2011	49	0.00	0
Research Experience in Carbon Sequestration	6/5-6/15/2011	30	0.00	0
World Bank CCS Training Session	09/06/11	43	0.00	0
SECARB-Ed CCS Training Session	09/14/11	39	2.50	98
SECARB-Ed CCS Training Session- AIChE Regional	10/6-10/7/2011	68	2.00	136
SECARB-Ed CCS Training Session -USCSC	10/25/11	37	0.00	0
SECARB-Ed CCS Training Session -Duke Energy Seminar	10/26/11	81	3.50	284
Is your facility carbon capture ready? Understanding the basics of carbon capture, utilization, and storage (CCUS)	11/30/11	180	1.00	180
SECARB-Ed CCS Training Workshop	02/06/12	14	4.00	56
Virginia Mining Association, Inc. Professional Engineers in Mining, Seminar	03/07/12	137	1.00	137
Research Experience in Carbon Sequestration	6/3-6/13/2012	30	0.00	0
<b>Total</b>		<b>1131</b>	<b>40</b>	<b>1951</b>

Figure 1. CEU/PDU Award Status.

## Benefits

The overall benefit of this project is a trained workforce that is instilled with CCUS best practices and who can accelerate the development and deployment of carbon capture and storage projects. The Southeast Regional CO<sub>2</sub> Sequestration Training Program will facilitate national and global delivery of CCUS technologies

# SECARB-ED

Southeast Regional Carbon Sequestration  
Technology Training Program



Figure 2. Photos taken from various courses created by the SECARB-Ed effort.