

**CCUS Education and Outreach at the
National Sequestration Education Center,
Decatur, Illinois**

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ABSTRACT

The Illinois Industrial Carbon Capture and Storage (IL-ICCS) project currently is the largest project under construction in the U.S. to store CO₂ in a deep saline formation. The Office of Fossil Energy's National Energy Technology Laboratory (NETL) manages this \$207.9 million project, which is scheduled to begin CO₂ injection in 2014. The project is led by Archer Daniels Midland Company (ADM) in Decatur, Illinois, in partnership with the U.S. Department of Energy, Schlumberger Carbon Services, University of Illinois-Illinois State Geological Survey, and Richland Community College. CO₂ will be captured from ADM's ethanol production plant and injected into the Mt. Simon Sandstone saline formation at a depth of approximately 7,000 ft. Over a three-year period, the IL-ICCS project will inject approximately 2.5 million metric tons of CO₂ into the Mt. Simon Sandstone, which has an estimated CO₂ storage capacity of up to 151 billion metric tons.

Integral to the IL-ICCS project are Carbon Capture, Utilization, and Storage (CCUS) education and public outreach activities. This paper highlights the role of Richland Community College in the IL-ICCS project, including CCUS curriculum development, construction of the National Sequestration Education Center (NSEC), and CCUS outreach. In fall 2012, Richland offered the nation's first Associate degree programs with emphasis in CCUS at the NSEC, located on the college campus. The new programs included an Associate of Applied Science (AAS) degree in Engineering Technology with Sequestration Specialty and an Associate of Science (AS) degree with Sequestration Concentration, a university transfer degree. Richland's CCUS courses have also been accepted by several universities in Illinois as electives in their degree programs. The NSEC is a 15,000 sq ft facility featuring "smart" classrooms and laboratory space to provide a state-of-the-art learning environment with real time sequestration data acquisition, monitoring, and analysis. The NSEC Visitor Center includes the Sequestration Technology Education Learning Array (STELA), which is an interactive presentation to learn about CCUS technologies. Additionally, the NSEC features renewable energy technologies such as wind turbines, solar arrays, and geothermal and biomass heating systems. Richland's outreach includes K-12, teachers' workshops, and community and professional organizations. Outreach totals for 2011-2013 are 3,424,160 for direct outreach, radio, and television segments.

INTRODUCTION

Atmospheric concentrations of carbon dioxide (CO₂) are approaching 400 ppm, compared to pre-industrial levels of 280 ppm, enhancing the greenhouse effect and leading to global climate change (IPCC 2007). Human activities contributing to increased CO₂ concentrations include emissions from domestic sources such as heating, land clearing such as deforestation, the transportation sector, and stationary sources such as fossil-fuel power plants, ethanol production plants, and petroleum and natural gas processing facilities. Carbon Capture, Utilization, and Storage (CCUS), renewable energy resources, nuclear energy, and improvements in energy efficiency are all part of a portfolio of low carbon technologies to reduce anthropogenic CO₂ emissions to mitigate the effects of global climate change (IEA 2012). To deploy large-scale CCUS technologies under the Industrial Carbon Capture and Storage (ICCS) program, the United States Department of Energy (DOE) is collaborating with industry in cost sharing arrangements to demonstrate CCUS at economically-feasible stationary sources.

In Phase 1 of its ICCS program, the DOE selected the Archer Daniels Midland Company (ADM) team in October 2009 to test large-scale industrial CCUS technologies. In June 2010, the DOE selected three projects to receive continued Phase 2 funding, including ADM's Illinois Industrial Carbon Capture and Storage (IL-ICCS) project. The Office of Fossil Energy's National Energy Technology Laboratory

(NETL) is part of the DOE's national laboratory system and manages the IL-ICCS project, currently the largest project under construction in the U.S. to store CO₂ in a deep saline formation. The overall objective of the project is to demonstrate an integrated system for collecting CO₂ from ADM's ethanol production plant in Decatur, Illinois and geologically sequestering it in the Mt. Simon Sandstone formation. At the ADM facility, CO₂ is produced as a byproduct from processing corn into fuel-grade ethanol. The IL-ICCS project scope (Gollakota and McDonald 2012) includes (1) design, construction, demonstration, and integrated operation of CO₂ compression, dehydration, and injection facilities, (2) monitoring, verification, and accounting (MVA) of the stored CO₂, and (3) development of a communication, outreach, training, and education initiative.

The IL-ICCS project is scheduled to begin CO₂ injection in 2014 at a depth of approximately 7,000 ft. Over a three-year period, approximately 2.5 million metric tons of CO₂ will be injected into the Mt. Simon Sandstone, which has an estimated CO₂ storage capacity of up to 151 billion metric tons (DOE 2012a). The project presents a 'unique opportunity' (NETL 2012) to gather crucial scientific and engineering data for large-scale CO₂ storage in saline formations to mitigate global climate change. Additionally, successful implementation of the project could facilitate long-term CO₂ utilization options, such as enhanced oil recovery (EOR) in the Illinois Basin. The IL-ICCS project receives \$141.4 million in American Recovery and Reinvestment Act (ARRA) of 2009 funding and another \$66.5 million in private sector cost-sharing. The project team members are ADM, NETL, Schlumberger Carbon Services, University of Illinois-Illinois State Geological Survey, and Richland Community College.

RICHLAND COMMUNITY COLLEGE AND THE IL-ICCS PROJECT

Richland Community College (<http://www.richland.edu/>) features a main campus in Decatur, Illinois and four major extension sites. Richland offers over 150 degrees and certificates and serves approximately 7,600 students annually in eight central Illinois counties. The college has established itself as a vital asset to the community during its 40-year presence in the Decatur region. Integral to the IL-ICCS project are CCUS education and public outreach activities. The role of Richland Community College in the IL-ICCS project includes CCUS curriculum development, construction of the National Sequestration Education Center (NSEC), and CCUS outreach.

CCUS Curriculum Development

Richland Community College offers the nation's first Associate degree programs with emphasis in CCUS at the NSEC, located on the college campus. The new programs include an Associate of Applied Science (AAS) degree in Engineering Technology with Sequestration Specialty and an Associate of Science (AS) degree with Sequestration Concentration, a university transfer degree. Additionally, Richland's CCS 115 (Introduction to Carbon Capture and Storage) and CCS 275 (Advanced Sequestration Applications) courses have been accepted as elective courses in degree programs at five universities in Illinois: Eastern Illinois University (EIU), Illinois State University (ISU), Millikin University (MU), Southern Illinois University at Carbondale (SIUC), and University of Illinois at Urbana-Champaign (UIUC).

At Richland, all AAS degrees in Engineering Technology have the same general education or core set of courses, which enables students to enter an industrial setting to install, maintain, and repair industrial systems. Local employers (Table 1) of Richland graduates with an AAS degree in Engineering Technology include ADM, Caterpillar Inc., and Tate & Lyle PLC. ADM (<http://www.adm.com>) global headquarters is located in Decatur, Illinois. Its more than 265 processing plants and 30,000 employees convert corn, oilseeds, wheat, and cocoa into products for food, animal feed, chemicals and energy uses. ADM's role in the IL-ICCS project includes overall project implementation, project host site, construction, operation, and ownership. Caterpillar Inc. (<http://www.cat.com>) is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. Caterpillar's global headquarters is located in Peoria, Illinois, with a local plant in Decatur, Illinois. Tate & Lyle PLC (<http://www.tateandlyle.com>) is a British-based multinational agribusiness, with global headquarters in London, United Kingdom and a local plant in

Decatur, Illinois. Tate & Lyle is a global provider of distinctive, high quality ingredients and solutions to the food, beverage and other industries.

Table 1. Employment Opportunities and Core Coursework for Degree Programs with CCUS Emphasis

<u>Degree Program</u>	AAS in Engineering Technology with Sequestration Specialty	AS with Sequestration Concentration & BS in Earth, Society, and Environmental Sustainability
<u>Employers</u>	Archer Daniels Midland Company Caterpillar Inc. Tate & Lyle PLC Schlumberger Carbon Services	U.S. Environmental Protection Agency U.S. Army Corp of Engineers Bodine Services of the Midwest
<u>Expected Salary</u>	\$35,000/year	\$55,000/year
<u>Core Courses</u>	CCS 115(Introduction to Carbon Capture and Storage) CCS 275 (Advanced Sequestration Applications) BIOL 210 (Environmental Biology) ENGT 101 (Motor Control Fundamentals) ENGT 231 (Piping Fundamentals) ENGT 234 (Pump Applications) MATH 104 (Technical Mathematics)	CCS 115(Introduction to Carbon Capture and Storage) CCS 275 (Advanced Sequestration Applications) BIOL 210 (Environmental Biology) EASCI 210 (Physical Geography) EASCI 220 (Intro to Physical Geology) ECON 231 (Macroeconomics) MATH 190 (Calculus for Business and Social Science)

Within the AAS degree in Engineering Technology, the Sequestration Specialty coursework includes: CCS 115, CCS 275, and BIOL 210 (Environmental Biology). CCS 115 discusses CO₂ capture methods and transport, CO₂ utilization in EOR and enhanced coalbed methane recovery (ECBM), geologic sequestration in oil and gas reservoirs, unmineable coal seams, and deep saline formations, and IL-ICCS guest speakers and site visits. CCS 115 was offered in fall 2012 and is currently being developed as an online course. CCS 275 includes the use of seismograph and ground penetrating radar equipment and software, soil gas, soil CO₂ flux, shallow groundwater and deep subsurface water sampling, rock identification from IL-ICCS core samples, and CCUS outreach presentations. The coursework is currently being developed in collaboration with project partners. BIOL 210 includes global climate change and reducing global CO₂ emissions, an introduction to CCUS and the IL-ICCS project, terrestrial carbon sequestration, and alternative energy resources. BIOL 210 is offered at Richland in fall and spring semesters. Collectively, these courses provide students with a broad understanding of energy issues and resources and an in-depth knowledge of the CCUS process and IL-ICCS project. Schlumberger Carbon Services has expressed interest in Richland graduates with the Sequestration Specialty. Schlumberger Carbon Services (<http://www.slb.com/carbonservices>) provides technologies and services for the long-term geologic storage of CO₂. Experience and a detailed understanding of the varied challenges posed by CO₂ storage, gained by participation in many carbon capture and storage projects worldwide, is backed up by a corporate history of over 80 years in the oil and gas industry. Schlumberger headquarters is located in Houston, Texas. The role of Schlumberger in the IL-ICCS project includes site characterization, reservoir modeling, design, construction, and operation of the CO₂ injection and monitoring wells, and the subsurface MVA of the stored CO₂.

Richland's AS degree with Sequestration Concentration is a university transfer degree to Bachelor of Science (BS) degree programs in Illinois. Currently, the AS degree has been accepted by the University of Illinois at Urbana-Champaign (UIUC) for transfer to a BS degree in Earth, Society, and Environmental Sustainability (ESE) (<http://www.earth.illinois.edu/sustain>). The AS degree program includes CCS 115, CCS 275, and BIOL 210, as well as coursework in Chemistry, Geography, Geology, Economics,

Statistics, and Calculus. Graduates from the ESE degree program have gone on to graduate programs across the U.S. and careers in environmental consulting, sustainability management, and environmental engineering. Employers of Environmental Engineers include the U.S. Environmental Protection Agency, U.S. Army Corp of Engineers, and Bodine Services of the Midwest, which has a local office in Decatur, Illinois. Bodine Services of the Midwest (<http://www.bodineservices.com>) is a certified Illinois EPA Emergency Response Contractor and an Illinois EPA Corrective Action Contractor and is recognized throughout the Midwest as an industry leader of remediation and emergency response services. Bodine provides services in industrial plant maintenance, environmental consulting, environmental contracting, and waste transportation.

National Sequestration Education Center (NSEC)

The National Sequestration Education Center (NSEC) (Fig. 1) serves as the focal point for project partners and other stakeholders to conduct CCUS training and educational programs and CCUS outreach activities such as workshops, conferences, and public information sessions. The NSEC is located on the Richland campus and features “smart” classrooms and laboratory space to provide a state-of-the-art learning environment with real time data acquisition, monitoring, and analysis. Construction of the 15,000 sq ft facility began in July 2011 and was completed in August 2012. The NSEC ribbon cutting ceremony was held on September 19, 2012. In attendance were representatives from the IL- ICCS project, members of the Richland Community College Board and Richland Foundation, Decatur City Management, Congressional and State Legislators, and community members.



NSEC



NSEC Ribbon Cutting Ceremony



NSEC Classroom



STELA

Figure 1. National Sequestration Education Center (NSEC) Photos

The majority of the NSEC is dedicated to educational purposes, with two classrooms and a laboratory available for Richland’s CCUS curriculum development. The facility also contains offices for all IL- ICCS project partners, an Exhibit Hall with a 200 person capacity, and a Visitor Center for CCUS outreach activities. The NSEC Visitor Center features the Sequestration Technology Education Learning Array (STELA), which is an interactive presentation to learn about CCUS technology and the IL-ICCS

Project. STELA consists of a large (20 ft x 13 ft) projection screen and four iPads for participants to compete in earning points throughout the CCUS process, including (1) What is Carbon Dioxide or CO₂, (2) CO₂ Capture, (3) CO₂ Transport, (4) Geologic Storage of CO₂, and (5) Enhanced Oil Recovery. Accompanying STELA is an introductory video discussing the greenhouse effect, global climate change, and the use of CCUS and renewable energy sources to reduce atmospheric CO₂ emissions. STELA is appropriate for a wide variety of users and has been well-received during tours of the NSEC as a fun, game-based CCUS educational tool. In March 2013, a portable version of STELA was developed as a CCUS outreach exhibit. Portable STELA can be displayed on a 10 ft projection screen or on a 40 inch desktop television. Portable STELA has been displayed at College 101 – A guide to Richland Community College in Decatur, Illinois, the Clinton Area Chamber of Commerce Business Expo in Clinton, Illinois, the Midwest Lifelong Learning Conference in Chicago, Illinois, and the Twelfth Annual Conference on Carbon Capture, Utilization and Sequestration in Pittsburg, Pennsylvania.

Integrated into the NSEC design and construction are renewable energy and sustainability features (Table 2), including a geothermal system for facility heating and cooling, biomass fueled space and water heating systems for the adjacent Renewable Energy Laboratory, three wind turbines (10, 1, and 1 kw), three solar arrays (20, 5, and 1.8 kw), automated accelerated composter, biodiesel production center, and mobile biofuels laboratory. These technologies offset the energy needs of the NSEC, while serving as student laboratories in alternative energy resources. Additionally, in spring 2013, a ‘Sustainability Walkway’ will be constructed adjacent to the NSEC, providing visitors with a variety of educational experiences within a natural and aesthetic setting. Included in the walkway will be plots of native prairie grass and forb species and informational exhibits on fossil and renewable energy.

Table 2. National Sequestration Education Center (NSEC) Design Features

- 15,000 sq ft facility
 - 2 classrooms, each with 30 person capacity; classrooms divided by moveable partition to allow 60 person capacity
 - Laboratory with 60 person capacity; includes mobile biofuels laboratory
 - 4 offices for IL-ICCS project partners
 - Exhibit Hall with 200 person capacity
 - Visitor Center with Sequestration Technology Education Learning Array (STELA)
 - Geothermal heating and cooling system with 42 geothermal wells and 8 heat pumps
 - 3 wind turbines (10, 1, and 1 kw)
 - 3 solar arrays (20, 5, and 1.8 kw)
 - Energy efficient lighting, structural insulated panels (SIPs) used for exterior walls, carpet made of recycled materials, large windows for daylighting
 - Adjacent 900 sq ft Renewable Energy Laboratory with biomass fueled space and water heating systems, biodiesel production center, automated accelerated composter, and biodiesel engine trainer
 - Adjacent Sustainability Walkway with native prairie and forb species
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CCUS Outreach

Richland’s CCUS outreach includes K-12, teachers’ workshops, and community and professional organizations. CCUS outreach activities provide the public with (1) a general overview of CCUS technologies, including the benefits of CCUS, (2) an opportunity to ask questions and discuss concerns regarding CCUS, and (3) IL-ICCS project progress and results through presentations, websites (<http://nsec.richland.edu/>), and press releases. Additionally, outreach activities focus on Richland’s renewable energy resources and sustainability features as part of a portfolio of low carbon technologies to reduce atmospheric CO₂ emissions. Outreach totals for 2011-2013 are 3,424,160 for direct outreach, radio, and television segments (Table 3). Some highlights include WAND Television, the Illinois State Fair, Camp Connections, and NSEC tours.

Table 3. 2011 – 2013 Richland CCUS Outreach Activities

<u>2011 Activities</u>	<u>Attendees/Participants</u>
• Richland Summer Excursion	500 (1 st - 4 th grade students)
• 8 th Grade Career Fair	1,700 (students from 22 schools)
• Decatur Area College and Career Fair	1,600 (students from 24 schools)
• International Presentations	100 (at Richland presentations)
• NSEC Tours and IL-ICCS Presentations	326 (visitors to NSEC)
• Illinois State Fair	2,700 (Richland exhibit attendees)
• NSEC Groundbreaking Ceremony	90 (national attention)
• Farm Progress Show	100 (Richland exhibit attendees)
• WSOY Radio	5,000 (listeners for 5 segments)
• WAND Television	3,344,000 (viewers for 44 segments)
• Additional presentations at local events	4,730 (attendees)
<i>2011 Total</i>	<i>3,360,846 (direct, radio, and television)</i>
<u>2012 Activities</u>	<u>Attendees/Participants</u>
• 8 th Grade Career Fair	1,700 (students from 22 schools)
• Gifted Middle School STEM Science Day	50 (7 th & 8 th grade students)
• Lake Land College's Energy Innovation Conference	25 (at Richland presentation)
• College 101 – A Guide to RCC	150 (students and parents)
• ISU's Family Science Day	2,000 (students and parents)
• GUCS Webinar	25 (at Richland presentation)
• Camp Connections	1,100 (K-8 students)
• WSOY Radio	3,000 (listeners for 3 segments)
• Illinois State Fair	3,100 (Richland exhibit attendees)
• Cromwell Radio	1,000 (listeners for 1 segment)
• NSEC Tours and IL-ICCS Presentations	359 (visitors to NSEC)
• Decatur Public Schools Teachers Conference	120 (elementary school teachers)
• Decatur Area College and Career Fair	1,200 (students from 24 schools)
• NSEC Ribbon Cutting Ceremony	300 (stakeholders)
	1,000 (WSOY live remote)
	1,000 (Neuoff Media live remote)
• CCUS Teachers Workshop	30 (K-12 teachers)
• Heartland Technical Academy Open House	200 (students and parents)
• Additional presentations at local events	3,350 (attendees)
<i>2012 Total</i>	<i>19,709 (direct and radio)</i>
<u>2013 Activities</u>	<u>Attendees/Participants</u>
• 8 th Grade Career Fair	1,700 (students from 22 schools)
• WICS ABC Newschannel 20	38,000 (viewers for 1 segment)
• Maroa Forsyth H.S.	40 (science students)
• Richland Articulation Breakfast	100 (faculty from 14 high schools)
• College 101 – A Guide to RCC	130 (students and parents)
• NSEC Tours and IL-ICCS Presentations	85 (visitors to NSEC)
• Clinton Business Expo	500 (Richland exhibit attendees)
	1,000 (WEZC Radio live remote)
• Midwest Lifelong Learning Conference	50 (Richland exhibit attendees)
• ISU's Family Science Day	2,000 (students and parents)
<i>2013 Total</i>	<i>43,605 (direct, radio, and television)</i>
<i>2011 – 2013 Grand Total</i>	<i>3,424,160 (direct, radio, and television)</i>

WAND Television

In 2011, WAND Television in Decatur, Illinois shot 44 'Making the World a Little Greener' segments by Richland Community College faculty. Segments focused on CCUS, the IL-ICCS project, and the NSEC, as well as Richland's renewable energy resources and sustainability features. WAND Television estimated 3,344,000 households from throughout central Illinois viewed the 44 total segments.

Illinois State Fair

Richland was an exhibitor at the 2011 and 2012 Illinois State Fair (Fig. 2) in Springfield, Illinois, providing visitors from throughout Illinois with a general overview of CCUS and the IL-ICCS project. Richland's exhibit included CCUS posters, handouts, and activities from the Camp Connections summer academic enrichment program. Richland's exhibit received approximately 2,700 and 3,100 visitors in 2011 and 2012, respectively. Almost universally, visitors were supportive of the use of CCUS for CO₂ emissions reductions and for CO₂ utilization in EOR. All visitors were supportive of Camp Connections, with many K-8 teachers requesting additional information on program activities.



Illinois State Fair

Groundwater Sampling Demonstration



Camp Connections, Grades K-2

Figure 2. CCUS Outreach Photos

Camp Connections

Camp Connections is a summer academic enrichment program through Decatur Public Schools, Decatur Park District, Richland Community College, and 15 other community partners. Camp Connections is designed to support academic growth and achievement in a non-traditional, hands-on learning environment. Students engage in experiments and other activities, while learning about carbon sequestration in conjunction with biofuels production, solar energy, wind energy, recycling, and sustainable agriculture. Enrollment is focused on students requiring improvement in math and science skills. In 2011, enrollment totaled approximately 500 Decatur Public Schools students in grades 1-4. Following the program, Illinois Standards Achievement Test (ISAT) scores improved in reading and mathematics for students in grades 2-4, and parental survey data was highly supportive of the program.

The DOE (2012b) highlighted Richland's CCUS educational outreach at Camp Connections, the Illinois State Fair, and the Farm Progress Show. In 2012, approximately 1,100 students in grades K-8 were enrolled in Camp Connections. Students that attended camp were better prepared for the upcoming academic year, showing a 28% increase in math scores and higher Exit Exam scores compared to students not enrolled in the program. High enrollment is again expected for 2013. Additionally, Richland is developing 'The Green Guide: A Handbook for Teachers', along with a 'Teachers Tool Kit' that includes all Camp Connections activities. Decatur Public Schools has expressed interest in adding these materials to their curricula.

NSEC Tours

The local community has shown interest in the IL-ICCS project, and several tours of the NSEC have been conducted for community organizations, schools, and teachers' workshops. Once visitors have been provided an overview of CCUS and the IL-ICCS project, followed by discussions of questions and concerns, the community has expressed broad support for the project and Richland's new Associate degree programs. Visitors have been impressed by the renewable energy features of the NSEC and have enjoyed the competitive and educational aspects of STELA. Additionally, organizations from outside of Illinois have expressed interest in the project and the NSEC, including Muscatine High School from Iowa and the Decatur sister city from Seevetal, Germany. The Muscatine group included 30 physics students that toured the NSEC, visited the IL-ICCS monitoring well, and were provided a shallow groundwater sampling demonstration. The group from Seevetal, Germany included 50 delegates that toured the NSEC as part of the 37th Sister City Anniversary with Decatur. All visitors were supportive of CCUS and Richland's role in the project.

LESSONS LEARNED

Lessons learned from Richland's role in the IL-ICCS project include:

1. *Illinois communities have expressed broad support for CCUS and the IL-ICCS project.* Richland Community College is a vital asset to the Decatur region, with 40 years of service to central Illinois. Richland also has a long relationship with ADM, strengthening the IL-ICCS project partnership and fostering trust and support for the project by local communities. Additionally, extensive CCUS outreach activities throughout Illinois have allowed communities to ask questions and express concerns regarding CCUS, resulting in widespread public support for the project.
2. *The IL-ICCS project and Richland Community College have received national and international recognition.* The Carbon Sequestration Leadership Forum (CSLF), an international carbon storage organization, has officially recognized the IL-ICCS project for making significant contributions to the development of global CO₂ mitigation technologies (DOE 2012c). The American Association of Community Colleges (AACC), a national organization representing the nearly 1,200 community, junior, and technical colleges in the U.S., has cited 25 colleges for innovation and progressive practices. Richland Community College was selected as a finalist for the 2013 AACC Award of Excellence in the category: Outstanding College/Corporate Partnership.
3. *Students, universities, and industries have supported CCUS curriculum development.* In fall 2012, nine CCS 115 students and 14 BIOL 210 students successfully completed coursework at the NSEC. CCS 115 is currently being developed as an online course, and in spring 2014, CCS 115, CCS 275, and BIOL 210 will be offered. Richland's CCS courses have been accepted as electives at several universities in Illinois. The AS degree program has been accepted for transfer to a BS degree program. Local industries and Schlumberger Carbon Services are interested in Richland graduates from the AAS degree program.
4. *The NSEC serves as an educational and outreach facility for CCUS and renewable energy technologies.* The majority of the NSEC is dedicated to CCUS curriculum development. Also offered are certificate programs in renewable energy. NSEC tours have increased the visibility of the IL-ICCS project and resulted in community support for a combination of CCUS and alternative energy sources

to reduce CO₂ emissions. STELA has been well-received as a CCUS educational tool. In 2013, the Camp Connections program will be held at the NSEC.

5. *K-8 outreach has been successful in improving STEM skills.* The Camp Connections program supports academic growth by providing hands-on activities in the fields of science, technology, engineering, and mathematics (STEM). Enrollment in Camp Connections has increased from 500 students in 2011 to 1,100 students in 2012, with high enrollment expected in 2013. The program has resulted in improved student test scores, parental support, and the development of a teachers' handbook to be added to K-8 curricula.

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DISCLAIMER

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