

## A process for stakeholder education and engagement in sustainable energy: The carbon sequestration case

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### ABSTRACT

The Virginia Center for Coal and Energy Research is leading an interdisciplinary coalition to identify potential carbon sequestration sinks in unmineable coalseams as part of the U.S. Southeast Regional Carbon Sequestration Partnership. The Virginia Center for Coal and Energy Research and the Eastern Coal Council are leading education efforts for the project, as well as specific outreach efforts in Central Appalachia in order to develop a process for stakeholder education and engagement in sustainable energy.

### 1. INTRODUCTION

#### *1.1 The Carbon Sequestration Case*

The International Energy Agency (IEA) World Energy Outlook (WEO) Reference Scenario projects, based on current government policies, that by 2030 carbon dioxide (CO<sub>2</sub>) emissions will be almost 90% higher than 1990 levels (IEA, 2004). In order to avoid substantial increases in greenhouse gases over the next few decades, stronger actions by governments must be taken (IEA, 2004). The development and deployment of technology options to capture CO<sub>2</sub> produced from fuel use at major point sources, and prevent it from reaching the atmosphere by storing it, has the potential to cut emissions significantly (IEA, 2004).

Carbon capture and storage (CCS) technolo-

gies (Fig. 1) can reduce CO<sub>2</sub> emissions from anthropogenic sources. CCS presents one of the most promising options for large-scale reductions in CO<sub>2</sub> emissions (WCI, 2007).

The recent Massachusetts Institute of Technology study *The Future of Coal* (Katzner, 2007) agrees with the IEA and the WCI reports when it states, "We conclude that CO<sub>2</sub> capture and sequestration is the critical enabling technology that would reduce CO<sub>2</sub> emissions significantly while also allowing coal to meet the world's pressing energy needs." Carbon sequestration could help lead the world into a sustainable energy environment where social, economic and environmental goals can be met.

#### *1.2 Overview*

The Virginia Center for Coal and Energy Research (VCCER) leads an interdisciplinary coalition to identify potential carbon sequestration sinks within the Commonwealth of Virginia and to test the storage of CO<sub>2</sub> in coal seams as part of the Southeast Regional Carbon Sequestration Partnership (SECARB), one of seven partnerships created by the U.S. Department of Energy (DOE) to determine optimum approaches for capturing and storing CO<sub>2</sub>.

The seven partnerships (Fig. 2) that currently form this network include more than 300 state agencies, universities, and private companies, spanning 40 states, three Indian nations, and four Canadian provinces. In addition, agencies from six member countries of the Carbon Se-

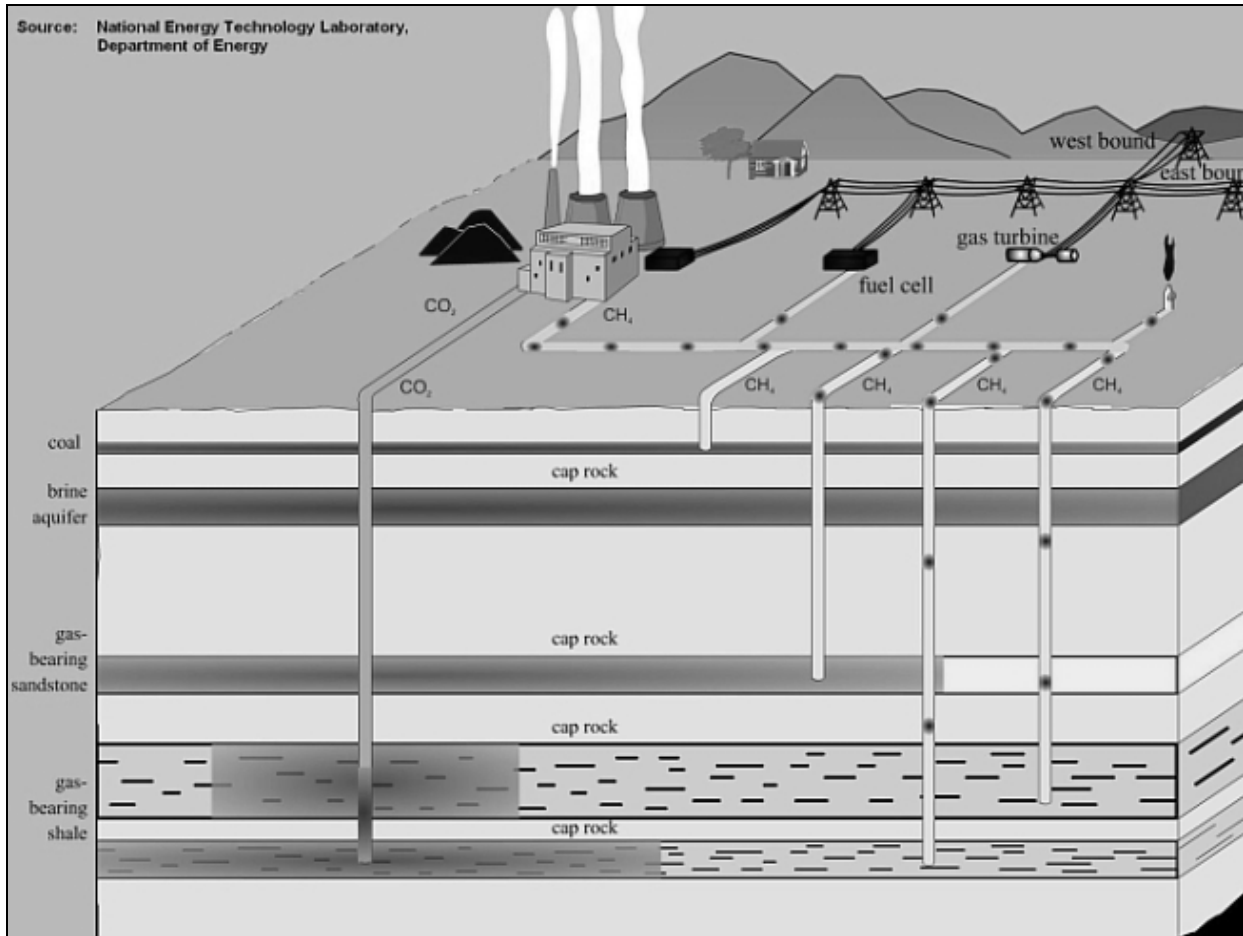


Figure 1: Carbon Sequestration (NETL, 2007a).

questration Leadership Forum are participating in the Validation Phase field tests. The first phase of work, known as the Characterization Phase, was conducted from September 2003 through June 2005. The second phase, known as the Validation Phase, is under way and will conclude by the fall of 2009 (NETL 2007B).

The commitment of the current U.S. administration to an integrated sequestration and hydrogen research initiative, including the Regional Carbon Sequestration Partnerships and the FutureGen power plant, has the potential to ensure the continued availability of low-cost electricity in the United States and to manage the potential environmental and financial risks of climate change (Karmis and Ripepi, 2004).

### 1.3 SECARB Coal Seam Group

The SECARB Coal Seam Group is comprised of individuals from the VCCER, Marshall Miller & Associates, the Eastern Coal Council (ECC), the Geological Survey of Alabama, the Kentucky Geological Survey and Advanced Re-

sources International. This group is researching the potential for unmineable coal seams to sequester carbon dioxide emissions from power plants, while enhancing the recovery of coalbed methane. Injected carbon dioxide is adsorbed and stored on the coal surface while releasing methane that can be commercially recovered. Carbon sequestration into unmineable coal seams, therefore, allows the utilization of unexploited mineral resources while reducing greenhouse gas emissions (Ripepi et al., 2006).

The primary objective of the SECARB Coal Seam Group under Phase II is to verify the sequestration capacity and performance of mature coalbed methane (CBM) reservoirs through two field test sites in the Central Appalachian Basin in Virginia and the Black Warrior Basin in Alabama shown with stars in Figure 2. This project includes sequestration testing in actively producing CBM wells and may develop breakthrough technologies for enhanced coalbed methane recovery (ECBM). One thousand tons of CO<sub>2</sub> will be injected into each test site. Both

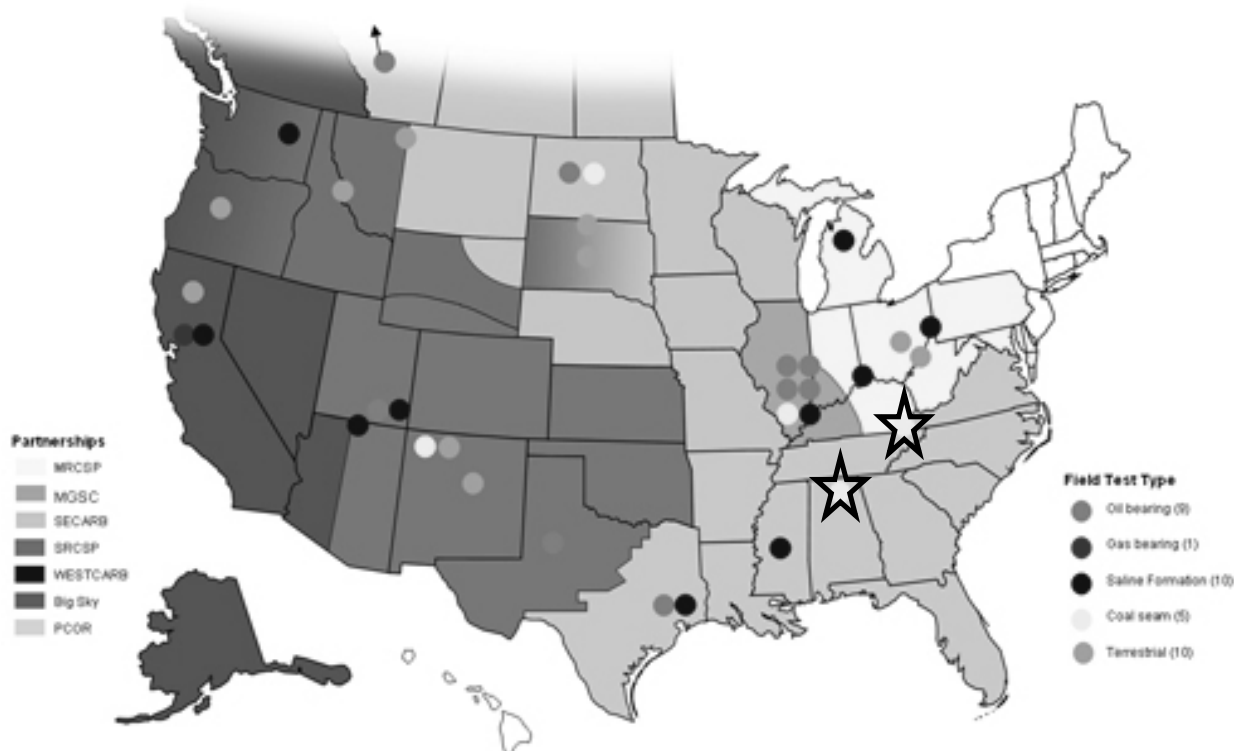


Figure 2: U.S. DOE Regional Carbon Sequestration Partnerships (NETL, 2007b).

surface and subsurface monitoring programs will be implemented to measure and verify the location of the stored CO<sub>2</sub>. Throughout this program, vigorous public outreach and technology transfer activities will be conducted.

#### 1.4 Education and Outreach

The VCCER and the ECC lead education efforts for the project, as well as specific outreach efforts in Central Appalachia. Education efforts will focus throughout the coal seam pilot test region on developing a better-informed public, with a general understanding of the concepts of global warming, the greenhouse effect, CO<sub>2</sub> emissions and carbon sequestration. Outreach efforts will be directed specifically toward the localities in which tests are planned and will serve to inform residents, businesses and community leaders of the nature, risks and mitigation associated with the testing.

## 2. DEVELOPING AN EDUCATION PLAN

### 2.1 Education Plan

The VCCER and ECC have developed an education plan concentrating on producing education materials and disseminating this informa-

tion to the general public. The goal of the education plan is to better inform the general public on the concepts of global warming, the options for mitigating the release of greenhouse gases and the development of sustainable energy technologies.

### 2.2 Educational Materials

The team was not satisfied that materials readily available were appropriate for elementary or secondary educational settings or for the general public, so the Coal Seam Group is developing appropriate materials, in the following stages:

- Produce digital video clips for dissemination via the Internet, at lectures and public information sessions.
- Develop power point presentations and handouts based on the images created for the videos.
- Create an education page within the SECARB section of the VCCER web site, [www.energy.vt.edu](http://www.energy.vt.edu).

### 2.3 Dissemination of Materials and Information

Materials will be made available to Kindergarten through 12<sup>th</sup> grade teachers throughout the region, with information identifying the sections

of the applicable state and national Standards of Learning that they support. Teachers will also be contacted through the summer educational programs and general extension programs offered by the Powell River Project.

A speakers bureau will be created, using respected individuals willing and able to make presentations locally. Speakers will meet with VCCER and ECC staff for training sessions and will be provided with educational materials to support their efforts within their communities.

The VCCER will join and coordinate with local organizations throughout the region that offer possibilities for public education and will participate in local and regional conferences, fairs and information sessions. These include the Nature Conservancy, Sustainable Blacksburg, League of Women Voters, local civic organizations, chambers of commerce, etc.

### 3. DEVELOPING AN ACTION PLAN FOR OUTREACH

#### 3.1 Outreach Plan

The VCCER and ECC have developed an outreach plan concentrating on educating the public living in proximity to the test sites. The goal of the outreach plan is to inform the public of the nature and risks associated with the testing and reassure those living near the test site.

#### 3.2 Outreach Efforts

Outreach efforts will be directed specifically toward the localities in which tests are planned. The details will depend upon the specific situations in each locale. At a minimum, however, the following is planned:

- Researchers, minerals rights owners and appropriate subcontractors will meet individually with property owners in the immediate vicinity of the test sites. The purpose of these meetings will be to inform them of the nature, risks and mitigation associated with the testing; to allow opportunity for face-to-face questions and answers, and to reassure those living and operating businesses near the test site.
- Researchers, minerals rights owners and appropriate subcontractors will meet with local government officials, including county boards of supervisors, town councils, local

administrators and citizen groups in the geographical area surrounding the test sites. Plans are to begin with the county and/or town government in the jurisdiction where the test will take place, and then work out in concentric rings to meet with all the government entities in contiguous geopolitical subdivisions.

- Provide responses to media and concerned citizens and governments. It is anticipated that representatives of the media, concerned citizens and local government officials will have questions and concerns, especially after any press coverage of the meetings described above. Press packets will be available and a trained individual designated to respond to all inquiries.

### 4. CONCLUSIONS

The carbon sequestration engagement plan is progressing in two stages: educating the individuals who will take responsibility for implementing education and outreach programs and developing and distributing educational materials.

Outreach personnel of the VCCER and the ECC charged with developing and implementing education programs first had to be educated regarding the basic science behind the SECARB project, to become familiar with the level of public knowledge of carbon sequestration and climate change issues, and to learn what materials had already been developed during Phase I of the projects nationally. The educators participate in the Outreach Working Group (OWG) conference calls and meetings, attend conferences on carbon sequestration and monitoring, and attend information meetings for the SECARB Phase II partnership and its stakeholders.

Development of the educational materials for the production of digital video clips are underway. Scripts/screen plays for these have been written and a programmer is being sought to develop the videos. Power point presentations and handouts will be based on the images created for the videos. This will provide a complete package of information in several media, appropriate for a general audience.

The outreach plan is progressing and implementation will begin as soon as the agreements with the landowner and well operator are final-

ized. These have gone through the negotiation stage and are pending final approval.

Success of the education and outreach program will be monitored at the national, regional and local levels. Nationally, the United States' Department of Energy will monitor the success of the Regional Partnerships and the OWG. On a regional level, SECARB, managed by the Southern States Energy Board, will monitor the success of the field tests and related outreach and educational programs. Locally, the VCCER and the ECC will monitor the success of this project through feedback from stakeholders, including state and local governments, industrial partners and the general public.

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