Plains CO_2 Reduction (PCOR) Partnership

Practical, Environmentally Sound CO_2 Sequestration – Phase II

Regional CO_2 Sequestration Potential – Field Validation Tests

Experts agree that it may take decades to implement the full range of options under consideration to effectively manage CO_2 released from human activities like transportation, home and commercial heating and cooling, and manufacturing and electrical generation. Billions of tons of CO_2 may require long-term storage. The Plains CO_2 Reduction (PCOR) Partnership region has significant capacity for a variety of projects for long-term CO_2 storage in underground geologic formations, as well as in vegetation and soils.

Global Issue – Dynamic Regional Partnership

Since its inception in 2003, the PCOR Partnership has brought together over 85 public and private sector groups working to lay the groundwork for practical and environmentally sound CO_2 sequestration in the heartland of North America. Covering a region of all or part of nine states and four Canadian provinces, the PCOR Partnership is one of seven regional partnerships in the U.S. Department of Energy's (DOE's) Regional Carbon Sequestration Partnership Initiative. The PCOR Partnership is managed by the Energy & Environmental Research Center at the University of North Dakota and supported by DOE, as well as its many U.S. and Canadian members.

CO_2 Facts

Carbon dioxide (CO_2) is a gas that occurs naturally in small amounts in the Earth's atmosphere. CO_2 is important to plant life and to the natural greenhouse effect that makes earth livable. Humans add to the level of CO_2 in the atmosphere through agriculture, burning fossil fuels, and industrial activity. The concern that CO_2 from human activities could impact global climate and weather is the basis for CO_2 management efforts. CO_2 management options include greater efficiency in energy systems, greater use of renewable and alternative fuels, energy conservation, and the focus of the PCOR Partnership activities: CO_2 sequestration.

What Is CO_2 Sequestration?

CO_2 sequestration is a way of managing CO_2 from human activities. Specifically, sequestration means capturing CO_2 and putting it into temporary or permanent storage. Terrestrial sequestration is using plants to capture CO_2 from the air and then storing it in vegetation or soils. Geologic sequestration is capturing CO_2 from exhaust or process gas and placing it in permanent storage in suitable underground geologic formations.

Phase II – Validation Tests to Clear the Way

In the fall of 2005, the PCOR Partnership embarked on a 4-year, multimillion-dollar field verification program designed to enhance the local expertise, experience, and working relationships needed to develop practical and environmentally sound sequestration operations in the region. The four field validation tests (illustrated on the back of this page) were developed to test the efficacy of CO_2 sequestration in our region. The region will also benefit from the "lessons learned" in more than two dozen sequestration demonstrations that will be conducted in the other six DOE partnership regions across North America as well as from the sequestration projects under way in other parts of the world. The knowledge garnered from these demonstrations will help identify and implement projects to realize the best opportunities for monetized CO_2 offset projects in the region, including value-added CO_2 enhanced oil and gas recovery projects and terrestrial CO_2 sequestration projects.

Outcomes

The results of the PCOR Partnership's Phase II activities will include 1) technical data and reports on its four field verification activities; 2) television documentaries on the field verification activities and other topics; 3) enhanced working relationships between government, regulatory, industry, and citizen groups with respect to sequestration project opportunities; 4) an enhanced assessment of the terrestrial and geologic sequestration capacity and opportunities in the region; and 5) an improved assessment of the economic opportunities to the region represented by CO_2 sequestration, particularly with respect to enhanced production of oil and gas resources and the monetization of CO_2 emission credits.

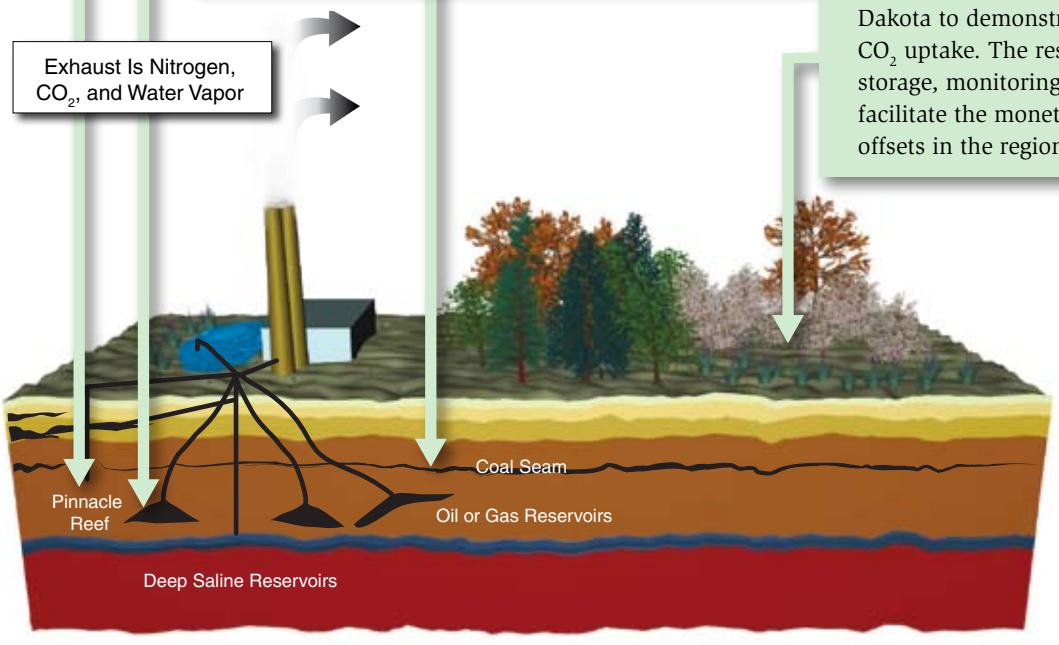
Phase II: Field Validation Test Sites

CO_2-rich gas in a pinnacle reef structure – Acid gas (approximately 70% CO_2, 30% hydrogen sulfide [H_2S]) from natural gas-processing plants in northern Alberta, Canada, is being injected into an oil-producing zone in an underground pinnacle reef structure. Results will help to determine the best practices to support sequestration in these unique geologic structures as well as further our understanding of the effects of H_2S on tertiary oil recovery and CO_2 sequestration.

CO_2 in a deep oil reservoir – CO_2 will be injected into an oil-bearing zone at great depth in the Williston Basin in western North Dakota. The activity will be used to determine the efficacy of CO_2 sequestration and the use of CO_2 to produce additional oil from other deep carbonate source rocks.

CO_2 in an unminable lignite seam – CO_2 will be injected into unminable lignite seams in northwestern North Dakota. The injected CO_2 will be trapped by naturally bonding to the surfaces of the fractured lignite. The injected CO_2 also has the potential to displace methane occupying the coal fractures. This validation test will provide valuable information regarding lignites for both CO_2 sequestration and enhanced coalbed methane production.

Out of the air – into the soil – A managed wetland is being implemented in north-central South Dakota to demonstrate practices that will improve CO_2 uptake. The results will help to optimize CO_2 storage, monitoring and verification methods, and facilitate the monetization of terrestrial carbon offsets in the region and elsewhere.



The PCOR Partnership has launched a 4-year program to evaluate the feasibility of storing CO_2 in a variety of settings from wetlands to subsurface oil reservoirs and unminable coals.

The Plains CO_2 Reduction (PCOR) Partnership is a group of public and private sector stakeholders working together to better understand the technical and economic feasibility of sequestering CO_2 emissions from stationary sources in the central interior of North America. The PCOR Partnership is managed by the Energy & Environmental Research Center (EERC) at the University of North Dakota and is one of seven regional partnerships under the U.S. Department of Energy's National Energy Technology Laboratory Regional Carbon Sequestration Partnership Initiative. To learn more, contact:

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Visit our Web site (www.undeerc.org/PCOR) for online sequestration resources.

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