EERC Energy & Environmental Research Center — Putting Research into Practice

PCOR Partnership

Plains CO_2 Reduction (PCOR) Partnership

Fact Sheet

Practical, Environmentally Sound CO_2 Sequestration

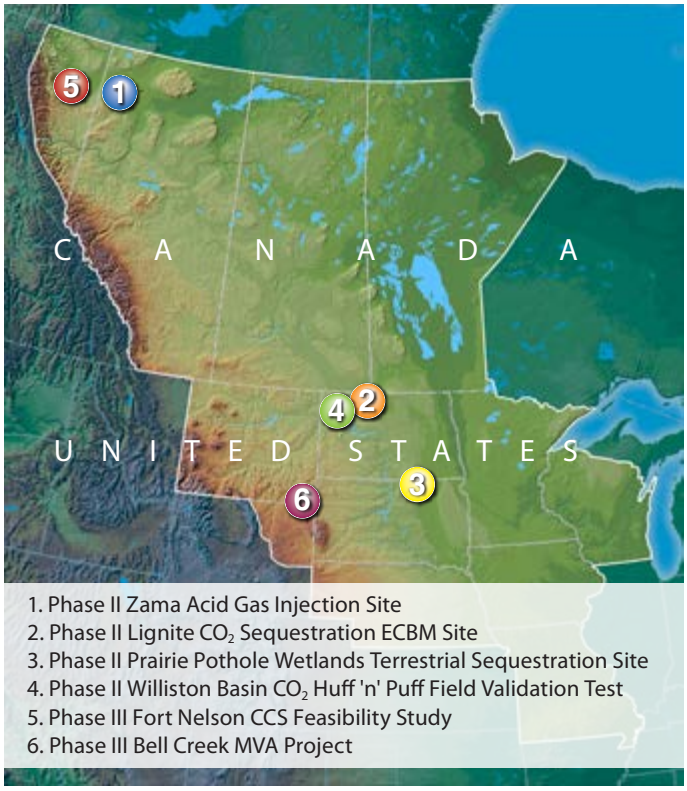
What Is the PCOR Partnership?

The Plains CO_2 Reduction (PCOR) Partnership is one of seven regional partnerships operating under the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP) Program. The RCSP Program is a government–industry effort tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture and storage (CCS) on the North American continent. The RCSP Program initiative is being implemented in three phases:

- Phase I – Characterization Phase: characterized opportunities for carbon storage
- Phase II – Validation Phase: focused on small-scale field tests
- Phase III – Development Phase: large-volume carbon storage tests currently under way

The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota in Grand Forks, North Dakota. The PCOR Partnership's many public and private sector stakeholders have expertise in agriculture, forestry, economics, energy exploration and production, geology, engineering, and the environment. Since the PCOR Partnership's inception in 2003, its members have provided data, guidance, financial resources, and practical experience with CCS and terrestrial sequestration. The PCOR Partnership region includes all or part of nine states (Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming) and four Canadian provinces (Alberta, British Columbia, Manitoba, and Saskatchewan).

Phase I activities were completed in September 2005. During Phase I, the PCOR Partnership assessed and prioritized the opportunities for sequestration in the region and helped to identify and assess the technical, regulatory, and environmental barriers to the most promising CO_2 storage opportunities. At the same time, the PCOR Partnership helped inform policymakers and the public regarding CO_2 sources, storage strategies, and storage opportunities.



1. Phase II Zama Acid Gas Injection Site
2. Phase II Lignite CO_2 Sequestration ECBM Site
3. Phase II Prairie Pothole Wetlands Terrestrial Sequestration Site
4. Phase II Williston Basin CO_2 Huff 'n' Puff Field Validation Test
5. Phase III Fort Nelson CCS Feasibility Study
6. Phase III Bell Creek MVA Project

PCOR Partnership Phase II validation test sites and Phase III demonstration sites.

What Is CCS?

Carbon dioxide (CO_2) is a major by-product of energy use. CCS means capturing CO_2 and putting it into environmentally sound permanent storage. Terrestrial sequestration is capturing CO_2 from the air and storing it for some period of time in soils or vegetation. Geologic CCS is capturing CO_2 from exhaust or process gas from large stationary facilities like factories and power plants and placing it in permanent storage, usually in underground geologic formations.

Why CCS?

There is concern that the ongoing accumulation of CO_2 and other greenhouse gases in the atmosphere from human activity may affect global climate. President Bush's Global Climate Change Initiative, issued in the spring of 2003, called for a reduction in U.S. CO_2 intensity. Conservation, more efficient power systems, renewable energy, and CCS are all tools to help reduce CO_2 intensity.

Purpose of the Project

The PCOR Partnership is assisting in the development of technologies to reduce CO_2 emissions to the atmosphere from large-scale sources as well as implementing projects to help reduce the level of CO_2 already in the atmosphere without adversely affecting economic growth or disrupting energy supply. The results of the PCOR Partnership's field tests will be used to 1) demonstrate the effectiveness of using CO_2 to enhance the production of hydrocarbons in reservoirs; 2) exhibit the cost-effective use of oil reservoirs for safe storage of CO_2; and 3) investigate other storage opportunities in the region: saline formations, depleted coal seams, and terrestrial sequestration.

The PCOR Partnership's Phase II ran October 1, 2005, to September 30, 2009, and included four field validation tests along with regional characterization, regulatory and permitting activities, and outreach. Three of these field-based demonstration projects focused on injecting CO_2 into geologic formations for the dual purpose of CO_2 storage and enhanced hydrocarbon production. The goals of these three demonstrations were twofold: 1) to develop approaches and attendant data sets that verified the ability of the target formations to store CO_2 as well as the potential to produce additional hydrocarbons through CO_2 injection and 2) to develop a scientifically defendable, engineering- and science-based methodology and mechanism by which carbon credits can be monetized for CO_2 sequestered in geologic formations. The monetization of carbon credits will enhance the economics of CO_2 enhanced oil recovery operations in the region. PCOR Partnership activities also support the future implementation of technologies to capture CO_2 at existing facilities throughout the region as well as technologies to support safe transportation and geologic CO_2 storage.

The EERC was awarded a research contract from DOE NETL for PCOR Partnership Phase III activities in late September 2007. Phase III is an 11-year project. The activities for Phase III of the PCOR Partnership include a feasibility study and a commercial-scale geologic CCS demonstration project, along with continued regional characterization, outreach, infrastructure development, and regulatory efforts. The PCOR Partnership evaluated the feasibility of injecting up to 2 Mt/year of CO_2 near the Fort Nelson Gas Processing Facility in northeastern British Columbia, Canada. It is also working with Denbury Onshore LLC to provide technical support to the storage elements of an enhanced oil recovery and CO_2 storage project in the Bell Creek oil field in southeastern Montana.

PCOR Partnership Accomplishments

PCOR Partnership accomplishments and activities include:

- A comprehensive regional assessment of CO_2 sources and sinks.
- The development and maintenance of the PCOR Partnership Decision Support System (DSS, © 2007–2016 EERC Foundation®), including a geographic information system (GIS)-based database that provides our sponsors with a tool to evaluate CO_2 storage opportunities in the PCOR Partnership region.
- Identification, ranking, and action plans for promising CO_2 storage demonstration projects.
- Recommendations for monitoring and verification systems.
- Outreach materials, including:
  - Numerous technical topical reports
  - Fact sheets on key regional CO_2 storage topics
  - Five 30-minute documentaries for public television:
    - Nature in the Balance: CO_2 Sequestration (2005)
    - Reducing Our Carbon Footprint: The Role of Markets (2008)
    - Out of the Air and Into the Soil – Land Practices That Reduce Atmospheric Carbon Levels (2008)
    - Managing Carbon Dioxide: The Geologic Solution (2009)
    - Global Energy and Carbon: Tracking Our Footprint (2010)
  - The PCOR Partnership Atlas, 4th Edition Revised (2013), which provides a general overview of CO_2 storage, a graphic summary of major regional CO_2 sources and sinks, and summaries of PCOR Partnership activities.
  - Public and members-only Web sites.

Attendees at the PCOR Partnership 2015 Annual Meeting in Chicago, Illinois.

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 storing CO_2 emissions from stationary sources in the central interior of North America. The PCOR Partnership is led 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 the PCOR Partnership Web site at www.undeerc.org/PCOR. New members are welcome.

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