

## Phase II Prospectus

### What Is the PCOR Partnership?

The Plains CO<sub>2</sub> Reduction (PCOR) Partnership is a diverse group of public and private sector stakeholders working together to better understand the technical and economic feasibility of capturing and storing carbon dioxide (CO<sub>2</sub>) emissions from stationary sources of CO<sub>2</sub> 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 funded by the U.S. Department of Energy's (DOE's) Regional Carbon Sequestration Partnership Initiative and a broad range of project sponsors.

Phase I activities were completed in September 2005. On June 9, 2005, the EERC was awarded a contract for Phase II, which began in October 2005. Phase II is a 4-year program focused on demonstration and validation of promising CO<sub>2</sub> sequestration opportunities in our region. The total value of Phase II is currently over \$21.5 million, with two-thirds of that funding coming from DOE and the balance contributed by industry and other nonfederal partners. The EERC is currently seeking additional partners for Phase II.

### PCOR Partnership Phase I Accomplishments

The Partnership has assessed and prioritized the opportunities for sequestration in the region and helped to resolve the technical, regulatory, and environmental barriers to the most promising sequestration opportunities. At the same time, the PCOR Partnership has informed policy makers and the public regarding CO<sub>2</sub> sources, sequestration strategies, and sequestration opportunities. The following products were completed in Phase I:

- A comprehensive regional assessment of CO<sub>2</sub> sources and sinks.
- The development of the PCOR Partnership Decision Support System (DSS), a geographic information system (GIS)-based database trust providing our sponsors with a tool to evaluate CO<sub>2</sub> sequestration opportunities in the PCOR Partnership region.
- Identification, ranking, and action plans for promising sequestration demonstration projects.
- Key GIS products for CO<sub>2</sub> sources and sinks, infrastructure, and regulatory issues.
- Recommendations for monitoring and verification systems.
- Outreach materials including technical topical reports and fact sheets on key regional sequestration topics, a public



PCOR Partnership Region

and members-only Web site, a 30-minute documentary for public television, and a regional PCOR Partnership Atlas.

*"Joining the Plains [CO<sub>2</sub> Reduction] Partnership is an approach that will dovetail nicely with our own carbon management policy and other carbon sequestration projects."*

—Xcel Energy Chairman and CEO Wayne Brunetti

### Who Is Involved in the PCOR Partnership?

The PCOR Partnership includes many public and private sector stakeholders from the region and elsewhere that represent expertise in agriculture, forestry, economics, energy exploration and production, geology, engineering, and the environment. Our partners provide technical services to the PCOR Partnership by providing data, guidance, and practical experience with direct and indirect sequestration, including value-added projects. PCOR Partnership Phase I and II partners include the following:

- U.S. Department of Energy
- University of North Dakota Energy & Environmental Research Center
- Abengo Bioenergy New Technologies
- Advanced Geotechnology, a division of Hycal Energy Research Laboratories, Ltd.
- Air Products and Chemicals, Inc.
- Alberta Department of Energy
- Alberta Energy and Utilities Board
- Alberta Energy Research Institute
- Alberta Geological Survey
- Ameren Corporation

- American Coalition for Clean Coal Energy
- American Lignite Energy (ALE)
- Apache Canada Ltd.
- Basin Electric Power Cooperative
- Bechtel Corporation
- Blue Source, LLC
- British Columbia Ministry of Energy, Mines and Petroleum Resources
- Carbozyme, Inc.
- Center for Energy and Economic Development (CEED)
- Chicago Climate Exchange
- Dakota Gasification Company
- Ducks Unlimited Canada
- Ducks Unlimited, Inc.
- Eagle Operating, Inc.
- Eastern Iowa Community College District
- Enbridge Inc.
- Encore Acquisition Company
- Environment Canada
- Excelsior Energy Inc.
- Fischer Oil and Gas, Inc.
- Great Northern Power Development, LP
- Great River Energy
- Hess Corporation
- Huntsman Corporation
- Interstate Oil and Gas Compact Commission
- Iowa Department of Natural Resources – Geological Survey
- Kiewit Mining Group Inc.
- Lignite Energy Council
- Manitoba Geological Survey
- Manitoba Hydro
- Marathon Oil Company
- MEG Energy Corporation
- Melzer Consulting
- Minnesota Geological Survey – University of Minnesota
- Minnesota Pollution Control Agency
- Minnesota Power
- Minnkota Power Cooperative, Inc.
- Missouri Department of Natural Resources
- Missouri River Energy Services
- Montana-Dakota Utilities Co.
- Montana Department of Environmental Quality
- Montana Public Service Commission
- Murex Petroleum Corporation
- National Commission on Energy Policy
- Natural Resources Canada
- Nexant, Inc.
- North American Coal Corporation
- North Dakota Department of Commerce Division of Community Services
- North Dakota Department of Health
- North Dakota Geological Survey
- North Dakota Industrial Commission Department of Mineral Resources, Oil and Gas Division
- North Dakota Industrial Commission Lignite Research, Development and Marketing Program
- North Dakota Industrial Commission Oil and Gas Research Council
- North Dakota Natural Resources Trust
- North Dakota Petroleum Council
- North Dakota State University
- Otter Tail Power Company
- Petroleum Technology Research Centre
- Petroleum Technology Transfer Council
- Prairie Public Television
- Pratt & Whitney Rocketdyne, Inc.
- Ramgen Power Systems, Inc.
- RPS Energy Canada Ltd. – APA Petroleum Engineering Inc.
- Saskatchewan Industry and Resources
- SaskPower
- Schlumberger
- Shell Canada Energy
- Spectra Energy

- Strategic West Energy Ltd.
- Suncor Energy Inc.
- Tesoro Refinery (Mandan)
- TGS Geological Products and Services
- University of Alberta
- University of Regina
- U.S. Geological Survey Northern Prairie Wildlife Research Center
- Western Governors' Association
- Westmoreland Coal Company
- Wisconsin Department of Agriculture, Trade and Consumer Protection
- Xcel Energy

## PCOR Partnership Phase II Goals and Objectives

The overall goal of PCOR Partnership Phase II is to validate technologies and identify locations in the Partnership region that can support future full-scale geological and terrestrial sequestration opportunities. The PCOR Partnership will accomplish this goal by:

- Continuing to assess regional carbon sequestration opportunities.
- Developing field validation projects.
- Evaluating the feasibility of commercial-scale selected carbon sequestration technologies.
- Assessing sink capacity permanence, economics, risk, public acceptance, and societal and monetary cobenefits.
- Providing outreach and education for CO<sub>2</sub> sequestration stakeholders and the general public.

Work continues on the development and implementation of one terrestrial sequestration field trial and two or more geologic field trials in Phase II. Our Phase II partners will have a voice in determining the direction of the PCOR Partnership and early access to the results of the program. Participation in Phase II also provides partners with unique opportunities to develop working relationships with stakeholders that represent a diverse cross section of CO<sub>2</sub> producers, end users, and regulators. Specifically, one of the goals of the PCOR Partnership is to broker working relationships between industries that generate CO<sub>2</sub>, those that can use it for value-added sequestration activities such as enhanced oil recovery (EOR), and the government agencies that oversee such activities.

Field validation tests include:

- Injection of acid gas into a depleted oil reservoir in Alberta, Canada, for acid gas disposal, EOR, and carbon sequestration.
- Injection of CO<sub>2</sub> into a deep carbonate reservoir in North Dakota for EOR and carbon sequestration.
- Injection of CO<sub>2</sub> into a lignite coal seam for enhanced methane production and carbon sequestration.
- Restoration of prairie pothole wetlands for carbon sequestration.

**How can you be involved?** We are currently seeking additional partners interested in PCOR Partnership Phase II activities. To learn more, contact:

**Edward N. Steadman**, Senior Research Advisor, (701) 777-5279; [esteadman@undeerc.org](mailto:esteadman@undeerc.org)

**John A. Harju**, Associate Director for Research, (701) 777-5157; [jharju@undeerc.org](mailto:jharju@undeerc.org)

Visit the PCOR Partnership Web site at [www.undeerc.org/PCOR](http://www.undeerc.org/PCOR).

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