

**Plains CO₂ Reduction (PCOR) Partnership Monthly Update
August 1–31, 2008**

PHASE II ACTIVITIES

Task 1 – Project Management and Reporting (Edward N. Steadman/John A. Harju)

Highlights

- Preparations for the 2008 PCOR Partnership Annual Meeting continue. The dates will be September 16–18, 2008, in Minneapolis, Minnesota.
- Work is done on a revision to the 2nd edition of the PCOR Partnership Atlas. We anticipate distribution will be ready for the 2008 PCOR Partnership Annual Meeting.
- Prairie Public Broadcasting will premiere “Out of the Air-Into the Soil: Land Practices that Reduce Atmospheric Carbon Levels” on September 26, 2008, at 8:30 p.m. Central Daylight Time.
- There were no Phase II Deliverables/Milestones due for August.
- There are no upcoming Phase II Deliverables/Milestones due for September.

Task 2 – Field Validation Test at a Williston Basin Oil Field, North Dakota (James A. Sorensen)

Highlights

- Evaluation of oil fields in Williston Basin that may be suitable candidates to host the injection and monitoring, mitigation, and verification (MMV) activities continued. Efforts are focused on developing baseline characterization data for fields in the Cedar Creek Anticline area, the Billings Anticline-Dickinson area, along the Nesson Anticline, and the Northeast Flank. Specifically, efforts were focused on developing a petrophysical model of the Rival oil field, which has been determined to be a potential host site for the Phase II demonstration.
- Laboratory tests were continued to examine the geochemical interactions between CO₂, saline water, and rocks. Rock examined included carbonate rocks that are representative of reservoir rocks being considered as potential target injection zones for the Williston Basin demonstration. Anhydrites and shales that may act as caprocks have also been examined. Preliminary results indicate that some changes in mineral composition can and do occur. It is anticipated that a series of these tests, using a variety of rock types, will continue to be conducted over the summer and fall of 2008, with the primary purpose being the development of rate of reaction data that can be used to refine geochemical models.

Task 3 – Field Validation Test at Zama, Alberta, Canada (Steven A. Smith)

Highlights

- Injection of acid gas has continued at Zama, representing a cumulative total of 20,000 tons to date as shown in Figure 1.
Pressure analysis and modeling are ongoing. This activity will be used to identify whether pressure spikes (should they occur) in the monitoring well can be attributed to leakage from the reservoir. Pressures have been history matched in the Slave Point and Keg River Reservoirs. Currently an analysis of the multiphase system (acid gas, oil, and water) is being evaluated to determine the behavior of injected gas in the reservoir and the relationship to pressure buildup and geomechanical failure.
- Coring of the Slave Point reservoir has been approved by Apache Canada, Ltd., and is scheduled to occur in mid-September.
- The Regional Technology Implementation Plan has been initiated. This document will combine the knowledge gained from the work conducted throughout the course of the Zama project.

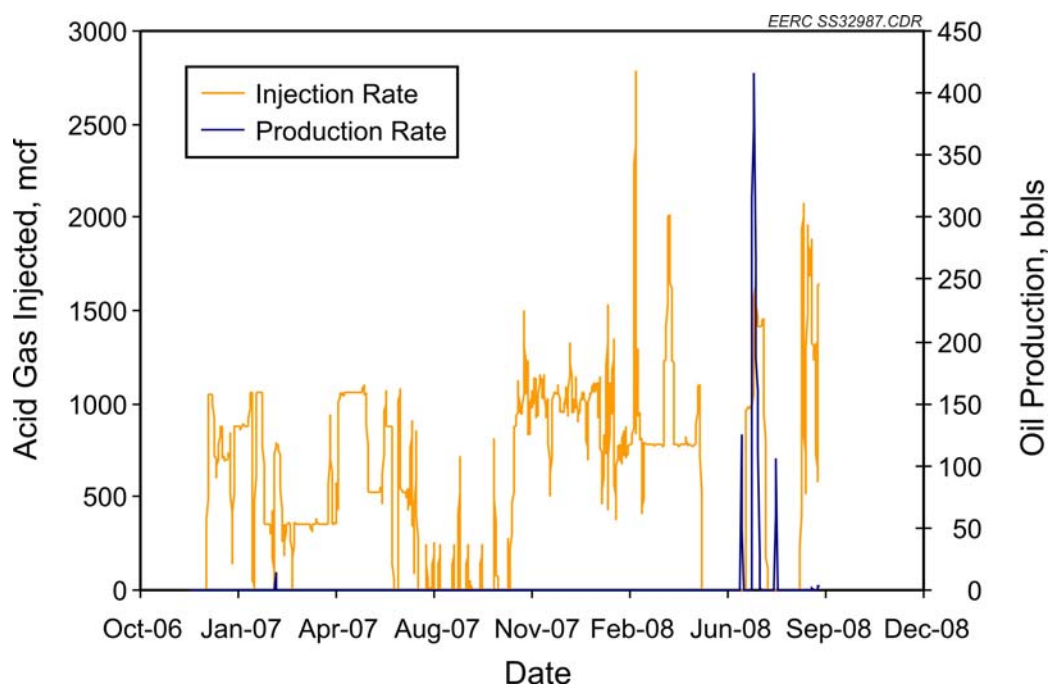


Figure 1. Injection and production profile from the Zama “F” Pool.

Task 4 – Field Validation Test of Lignite Coal in North Dakota (Lisa S. Botnen)

Highlights

- Negotiations continue with Praxair to supply and inject CO₂ at the site.
- A meeting was held on-site with Praxair and research staff to discuss the time line and logistics of injection.
- Discussions are ongoing with Pinnacle and Schlumberger with regard to MMV activities.

- The subsurface geologic model development continues. This model will be used to estimate reservoir capacity with respect to CO₂ storage or sequestration ability.
- A nitrogen fracture injection/falloff test (also known as NFIT) was conducted on North Dakota State Well 36-16 to derive in situ aquifer parameters of the lignite. The results indicate an initial reservoir pressure of $p_i = 345$ psia, which is significantly lower than the estimated hydrostatic pressure.
- To date, all wells have been acidized and have yet to produce any significant amounts of formation fluid. Because of this and the low reservoir pressure, it has been decided to amend the aquifer exemption application that was required to be submitted as part of the Underground Injection Control (UIC) permit application. The amendment will state that the target geologic formation can be considered neither an economically producible aquifer nor a formation hydraulically connected to the rest of geological system in the area. Work on this amendment is ongoing.
- Well development activities continue in order to prepare the wells for CO₂ injection.
- Downhole monitoring equipment has been procured. This system will collect temperature, pH, conductivity, and pressure data.
- Measurements of water levels and pressure in the wells continue to be taken on a regular basis.
- Additional gas samples from the wells have been obtained and analyzed.

Task 5 – Terrestrial Validation Test (Barry W. Botnen)

Highlights

- Field activities for the 2008 wetland catchment sampling season continue.
 - The Goebel Ranch and the Ipswitch Grasslands areas were sampled two times in August (854 gas samples from 17 wetlands were collected). These samples are being analyzed.
 - Additional information on soil moisture, soil and water temperature, water depth, and vegetative cover were collected.
 - Haying treatments were applied to selected wetland catchments on July 16, 2008. These selected catchments were also sampled two times in August.
- Grassland sampling has been completed in Montana, north-central and northeast North Dakota, and north-central Iowa. These samples are being analyzed.
- The carbon tracking system (Oracle-based database) is complete and operational.
- PCOR Partnership Partners continue to work toward obtaining International Standard Organization 14064-2, Voluntary Carbon Standard, Climate Community and Biodiversity Standards verification for grassland carbon credits.
- Ducks Unlimited, Inc. (DU), continues to make progress with respect to its carbon credit program. It has currently secured over 19,000 acres of private grasslands, with an initial goal set at 30,000 acres. Future projects are in process, pending accounting rules for verification and certification for grassland credits.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on greenhouse gas (GHG) emissions continues.
- A draft topical report, “Market Development for Terrestrial Sequestration on Private Lands,” is in final review at the Energy & Environmental Research Center (EERC).

- Evaluation of other state and regional GHG or cap-and-trade program rules and policies and the U.S. Department of Energy (DOE) Guidelines for Aggregators and Terrestrial Offset Providers is under way.
- The DU-PCOR Partnership terrestrial project Web site is being updated.
- Work continues on characterization inputs and the terrestrial portion of the Decision Support System (DSS, ©2007 EERC Foundation).

Task 6 – Continued Characterization of Regional Sequestration Opportunities (Wes Peck)

Highlights

- Virtual machine backups for the PCOR Partnership servers to minimize downtime during a server failure are in development.
- A revision to the 1500+ CO₂ sources through an effort to verify/refine location values for the sources is nearly completed. Summary results of the effort should be available soon.
- Latitude Geographics has reviewed the University of North Dakota-suggested changes to the user agreement, meaning that the final purchase of the software will be soon.
- The Web interface for the DSS products database is complete.
- The redesign of the DSS is under way:
 - Draft versions of the layout for the main and secondary pages have been assembled.
 - Work has begun incorporating documents into the database.
- The Capture Technology Document for DSS is nearing completion. This document will provide a cross-referenced summary of available CO₂ capture technologies.

Task 7 – Research, Safety, Regulatory, and Permitting Issues (Lisa S. Botnen)

Highlights

- Development of deliverable D40, the National Environmental Policy Act (NEPA) document for the Williston Basin Validation Test, is ongoing.
- Review of the U.S. Environmental Protection Agency's (EPA) Advanced Notice of Proposed Rulemaking (ANPR) for regulating GHG emissions under the Clean Air Act (CAA) continued.
- Review of EPA's proposed rules for regulating geological sequestration under the UIC program is complete. Development of a spreadsheet that will compare and contrast the EPA proposed rules with World Resources Institute's (WRI's) Guidelines and Interstate Oil and Gas Compact Commission (IOGCC) model rules has begun.
- General comments on EPA's proposed rules will be provided to the U.S. Government Accountability Office (GAO) at their request.
- A review of the regulatory and economics section of International Energy Agency's (IEA's) "Draft Aquifer Storage – Development Issues" document is complete.
- Various state, provincial, and regional GHG reduction and carbon capture and storage (CCS) initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to carbon capture and storage.

- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.

Task 8 – Public Outreach and Education (Daniel J. Daly)

Highlights

- D39: Task 8 – Documentary: Terrestrial CO₂ Sequestration and M10: Task 8 – Documentary: Terrestrial CO₂ Sequestration Reported
 - The documentary jackets and inserts were finalized internally and sent to Prairie Public Broadcasting (PPB).
 - An introduction was produced and approved for use on the DVD.
 - PPB completed the final revisions for the documentary, and the documentary was reviewed and approved internally.
 - The DVD master will be sent to Minneapolis to be cut and have copies made.
 - At a minimum, the documentary will be shown at the annual meeting; DVDs may or may not be given out, depending on the DVD reproduction time.
 - The PPB September program guide lists the terrestrial documentary for broadcast at 8:30 p.m. CDT on September 26, 2008 (partners will be notified by e-mail).
- D46: Task 8 – Documentary: Geologic Sequestration
 - A draft script of the Segment 1, the portion of the documentary which includes Texas and New Mexico, is due to PPB by close of business on August 15, 2008. PPB will use this to make an audio track.
 - The first third of the script was prepared and provided to PPB to begin the process of pulling clips and assembling an audio backbone for the piece.
 - We prepared a list of animation, met with the PPB animator on August 15, 2008, and are meeting internally to refine the concepts.
 - We will provide PPB with a list of existing video to pull for the geologic production.
- Outreach Working Group (OWG)
 - We participated in the monthly OWG conference call on August 21, 2008.
 - The call focused on the proposed EPA rules and Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) ramifications; follow-up discussions were held internally.

Task 9 – Identification of Commercially Available Sequestration Techniques Ready for Large-Scale Deployment (Melanie D. Jensen/Michael L. Jones)

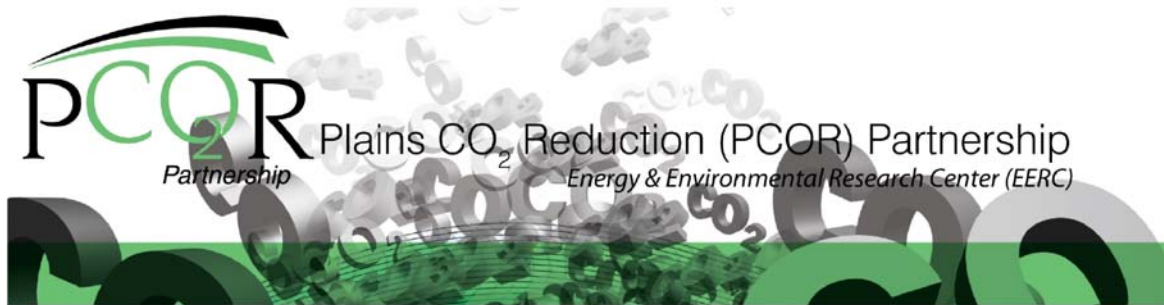
Highlights

- Remaining fiscal year funding for this task will be spent addressing comments resulting from the review of the deliverable report summarizing the cost and effort required for the initial efforts to capture, compress, and transport CO₂ within the PCOR Partnership region. The draft report was submitted on July 31, 2008, and comments are due back on August 30, 2008.

Task 10 – Regional Partnership Program Integration (Edward N. Steadman)

Highlights

- Preparations for the Regional Partnerships Annual Review Meeting (October 6–8, 2008, in Pittsburgh, Pennsylvania) are currently under way.
 - Project fact sheets are being updated for submission by September 19, 2008.
 - Three poster boards (on the geologic sequestration projects and a summary of the terrestrial sequestration) are also being developed.
 - The PCOR Partnership will also give presentations on the following topics:
 - ◆ Williston Basin Coal Seam Injection Test (to be given on October 6, 2008)
 - ◆ Zama – Keg River Formation (to be given on October 6, 2008)
 - ◆ Overview of the PCOR Partnership (to be given on October 7, 2008)
- The PCOR Partnership also continued participation in working group conference calls, including the following:
 - Geographic Information System (GIS)
 - Capture and transportation
 - Geologic
 - Outreach
 - Simulation and risk assessment



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wes Peck)

Highlights

- We attended the Environmental Systems Research Institute International GIS user's group meeting. A new carbon management section has been added to the annual conference, and the PCOR Partnership may have the opportunity to offer guidance in the development of new data models being compiled.
- A list of bulleted items is being prepared describing the challenges of pulling together data at various precisions of scale as related to geologic sequestration potential as well, and an accurate list of major CO₂ sources is being maintained. This effort may assist in a proposed trilateral effort in mapping and evaluating sinks and sources for North America.
- The Demonstration Project Reporting System outlined in the Phase III proposal will be incorporated in the newest design of the DSS.
- The establishment of a vendor agreement with the Minnesota Geological Survey is still under way.
- The Missouri Geological Survey has recently delivered a document summarizing Missouri's principal coal beds. There is no mention (yet) as to CO₂ storage suitability for any of the beds.
- An e-mail was sent to the participants of the last two PCOR Partnership Geology Work Group Meetings. The intent of the message was to determine who will be attending the work group meeting in September. To date, state/provincial representatives from Missouri, Iowa, Manitoba, and Minnesota will be attending. Representatives from Great Northern Power Development and BNI Coal will also be attending the meeting.

Task 2 – Public Outreach and Education (Daniel J. Daly)

Highlights

- School Outreach
 - We spoke with a teacher from Red River High School who is tied into a National Science Foundation program, and there is opportunity for educational activities on sequestration. We will be setting up a session with teachers in the fall to discuss educational materials.
 - Keystone held three workshops for teachers in other partnership regions around the country using the Keystone materials developed for and approved by DOE National Energy Technology Laboratory. The workshops are getting good reviews from teachers and partnership outreach personnel.
- Outreach Information System

- The focus on school demographics as well as obtaining information on select outreach venues in the region continues.
- EERC Video Capability
 - Interviews were conducted with select PCOR Partnership personnel as a basis for Web segments and to provide experience with the camera and editing system.
 - Activities were initiated on developing a release form for outside interviews such as “person on the street” interviews. Discussions were held with Grand Forks officials and with PPB to get background for the release. A draft release form was prepared and was reviewed internally by our Contracts Department. Comments from our Contracts Department were addressed, and the form is being reviewed again.
 - Once the camera equipment was obtained and tested with EERC systems, issues arose regarding file downloading, file sharing for projects, and in-house editing capability. As a result, an internal meeting was held to discuss software and computer needs. A summary was prepared of video project issues including needs resulting from interaction with PPB. As a result of the meeting, an equipment justification was prepared, reviewed, and refined for a high-definition camera download/video editing package that would include a powerful PC laptop dedicated to the camera, video editing software, and two 1 terabyte “My Book” external hard drives for data storage and backup.
 - The Adobe Premier Pro CS3 editing software was tested.
 - An internal meeting was held to define the EERC’s video short concept.
 - High-def B-roll video of the Northland pipeline construction in northeastern North Dakota was obtained.
 - An internal video camera and equipment orientation session for personnel and a follow-up hands-on session were held.
 - Mini-DV tapes to be used for obtaining video at the PCOR Partnership Annual Meeting were ordered, and a meeting to discuss video use and equipment issues was scheduled.
- Outreach Working Group
 - We participated in the monthly OWG conference call on August 21, 2008.
 - The call focused on the proposed EPA rules and RCRA and CERCLA ramifications and follow-up discussions were held internally.
- Measuring the impact of the public Web site
 - Information is available on PCOR Partnership Web hits, and this information is being compiled and assessed.
- Web site
 - An internal meeting was held to discuss improving graphics for the demonstration part of the Web site; a follow-up meeting is scheduled to discuss further.
- Weyburn Outreach Advisory Group
 - A draft report prepared by Bluewave Consultants was reviewed, and we will participate in a conference call on September 2 to discuss review comments.

Task 3 – Permitting and NEPA Modeling (Lisa S. Botnen)

Highlights

- Various state, provincial, and regional GHG reduction and CCS initiatives are being tracked and analyzed.
- An update to the regulatory section of the DSS is under development.

- Work continues on the NEPA questionnaire for the Williston Basin Test.
- Review of EPA's ANPR for regulating GHG emissions under the CAA continues.
- A review of EPA's proposed rules for regulating geological sequestration under the UIC program was completed. Development of a spreadsheet that will compare and contrast the EPA proposed rules with WRI guidelines and IOGCC model rules was begun.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to carbon capture and storage.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.
- Analysis of carbon market strategies continues.
- General comments on EPA's proposed rules will be provided to the GAO at their request.
- Completed a review of the regulatory and economics section of IEA's "Draft Aquifer Storage – Development Issues" document.
- Frequent updates are provided to task leaders with regard to federal, state, and provincial actions.

Task 4 – Site Characterization and Modeling (James A. Sorensen)

Highlights

- The EERC met with Spectra Energy, Natural Resources Canada, and Schlumberger in Calgary August 5–6, 2008, to discuss the key elements of the MMV plan for the Fort Nelson demonstration.
- Development of the MMV plan for the Fort Nelson demonstration continued. Efforts were focused on gathering and evaluating subsurface geological data, including historical seismic data.
- Development of Baseline Characterization Experimental Design Package for the Williston Basin site continued. Efforts were primarily focused on using well log data and field-based observations to characterize the general geological conditions of an area in southwestern North Dakota that includes several oil fields being considered for CO₂-based enhanced oil recovery activities under Phase III.
- Regional Characterization Activities
 - Development of a petrophysical model of saline aquifer systems in the Washburn Study Area continues.
 - Updating the oil field data in the DSS continued. Information for the state of North Dakota has been completely updated. Working with relevant agencies in other states and provinces to facilitate the updating process.

Task 5 – Well Drilling and Completion (TBA)

- This task has not begun (Quarter 1 – Budget Period [BP] 3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- All of the CO₂ capture technologies for which information can be obtained are currently being summarized. These summaries will be used to prepare an updated capture technologies topical report.
- We participated in a conference call regarding the WRI's CCS white paper/best practices manual.
- The capture technologies summary Web page that will be incorporated into the PCOR Partnership DSS after a thorough review was proofread.
- A replacement speaker for the Capture Workshop that will be held in conjunction with the PCOR Partnership Annual Meeting was found.
- Preparation of a draft updated capture technologies topical report was completed. Current work involves collecting and summarizing information about various CO₂ capture technologies. This information will be incorporated into the report.
- The update of the regional CO₂ sources' emission spreadsheet was completed; it will be submitted to the DSS group.

Task 7 – CO₂ Procurement (John A. Harju)

- Numerous discussions with potential CO₂ suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations (TBA)

- This task has not begun (Quarter 1 – BP 4; Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 9 – Operational Monitoring and Modeling (TBA)

- This task has not begun (Quarter 1 – BP 4; Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 10 – Site Closure (TBA)

- This task has not begun (Quarter 1 – BP 5; Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Post Injection Monitoring and Modeling (TBA)

- This task has not begun (Quarter 1 – BP 5; Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 12 – Project Assessment (Stephanie L. Wolfe)

- This task has not begun (Quarter 1 – BP 3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.
- Future activities include the Project Assessment Annual Report due December 31, 2008.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- A Risk Management Plan (RMP) outline is due within BP 3. An initial draft has been started for the RMP.
 - The risk management database research has also begun; initial contact has been made with consulting services.
- The Project Management Plan (PMP, Deliverable D63) has been revised to include updates on deliverable/milestone submissions and planned risk management activities. The PMP and Statement of Project Objectives were originally submitted to DOE in December 2007; they were both updated and submitted on August 22, 2008.
- Current and pending CO₂-related projects within the PCOR Partnership region are continuously changing. To better inform our partners, a Web site is presently being developed to exhibit CO₂ projects by location, parties involved, and Web site links to learn more about them.
- Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.
- Preparations for the Carbon Sequestration Development and Finance Summit (October 22–24, 2008, in Houston, Texas) are currently under way.
 - The PCOR Partnership is participating in a carbon capture and technology showcase panel discussion (October 22, 2008).
- The PCOR Partnership participated in the Carbon Management Council's Webinar on Carbon Capture and Storage on August 21, 2008.
- There were no Phase III Deliverables/Milestones due for August.
- Upcoming Phase III Deliverables/Milestones for September:
 - M2: Task 1 – Demonstration Project Reporting System Prototype
 - D1: Task 1 – Review of Source Attributes
 - D67: Task 4 – Fort Nelson Test Site – Simulation Report

Travel/Meetings for Phase II and III

- August 5–6, 2008: met with Spectra Energy, Natural Resources Canada, and Schlumberger in Calgary, Alberta, Canada.
- August 13–15, 2008: Coal-Gen in Louisville, Kentucky.
- August 21, 2008: Carbon Management Council's Carbon Capture and Storage Webinar.
- September 16–18, 2008: PCOR Partnership Annual Meeting in Minneapolis, Minnesota.
- September 23–24, 2008: Underground Injection Control and CO₂ Geosequestration Seminar in Cincinnati, Ohio.
- September 29 – October 2, 2008: Pittsburgh Coal Conference in Pittsburgh, Pennsylvania.

- October 6–8, 2008: Regional Partnerships Annual Review Meeting in Pittsburgh, Pennsylvania.
- October 22–24, 2008: Carbon Sequestration Development and Finance Summit in Houston, Texas.
- November 12–14, 2008: Carbon Market Insights Americas 2008 in Washington, D.C.
- November 16–21, 2008: AIChE National Meeting in Philadelphia, Pennsylvania.
- November 16–20, 2008: Greenhouse Gas Technology Conference (GHGT-9) in Washington, D.C.
- February 1–4, 2009: EUEC 2009 – Clean Air, Mercury, Global Warming & Renewable Energy in Phoenix, Arizona.