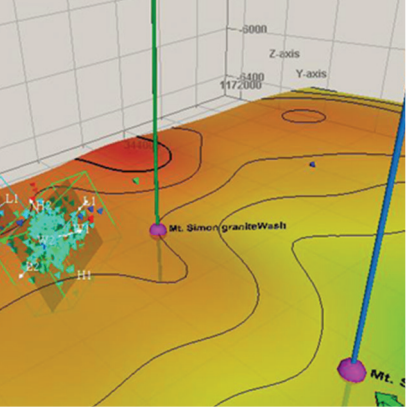
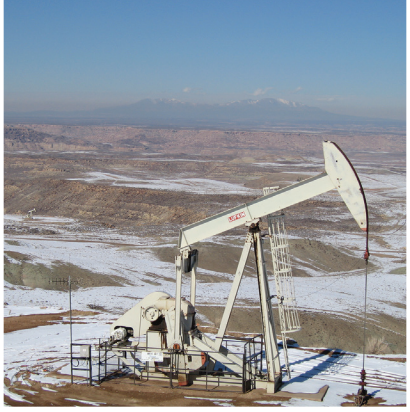
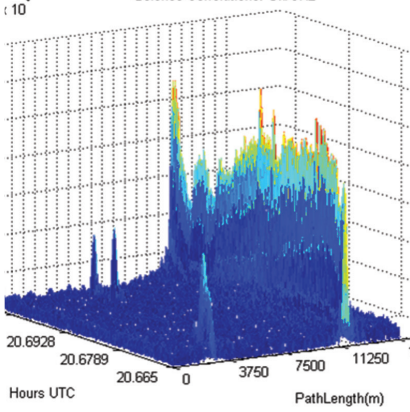
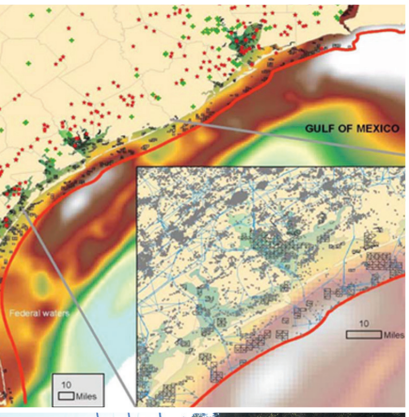


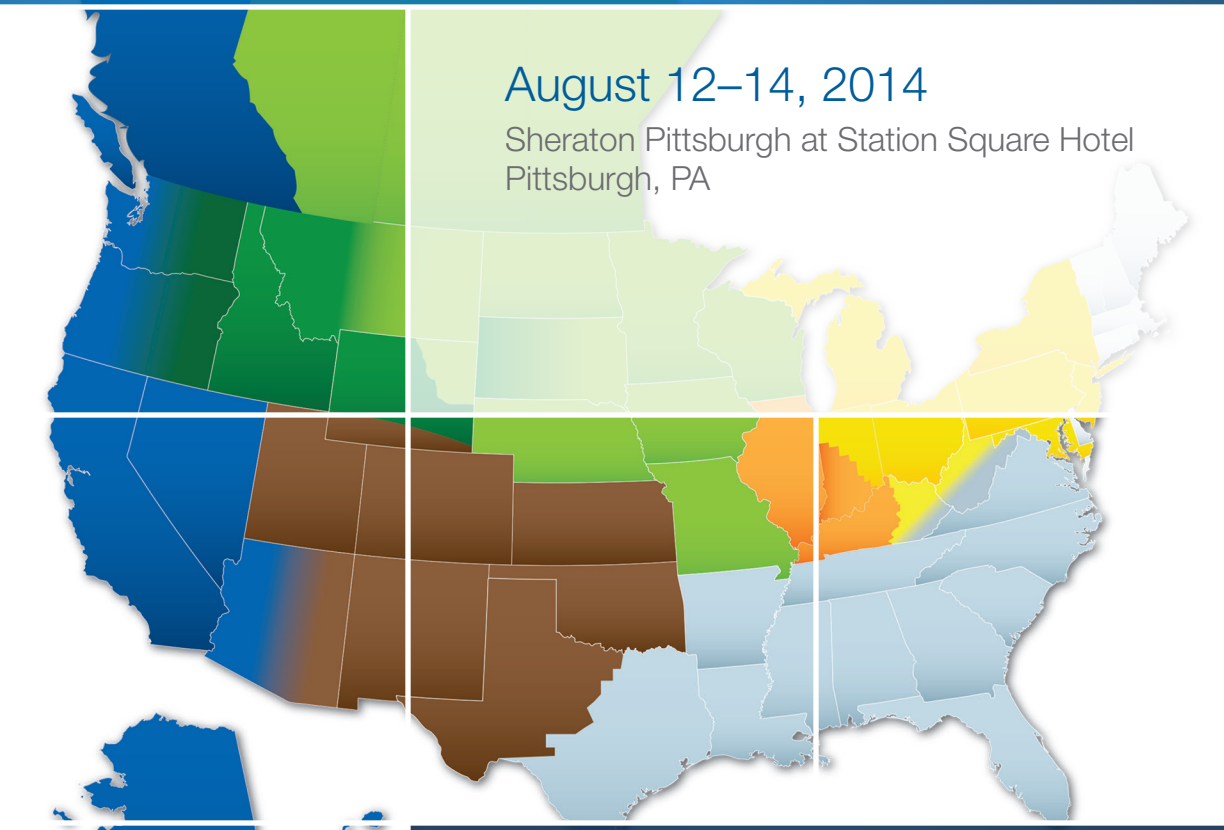




Carbon Storage R&D Project Review Meeting

Developing the Technologies and Infrastructure for CCS





August 12–14, 2014

Sheraton Pittsburgh at Station Square Hotel
Pittsburgh, PA

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U.S. DEPARTMENT OF ENERGY

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Carbon Storage R&D Project Review Meeting

Developing the Technologies and Infrastructure for CCS

U.S. Department of Energy
Fossil Energy and National Energy Technology Laboratory
August 12–14, 2014
Sheraton Station Square Hotel, Pittsburgh, Pennsylvania

TUESDAY, AUGUST 12, 2014 – GRAND STATION BALLROOM

7:00 a.m. **Meeting Registration**

8:00 a.m. **Welcome and Introduction**
Traci Rodosta, Carbon Storage Technology Manager, DOE National Energy Technology Laboratory

KEYNOTE PRESENTATION

8:05 a.m. **FUTURE OF CARBON STORAGE RESEARCH**
Julio Friedmann, Deputy Assistant Secretary for Clean Coal, DOE

PLENARY SESSION – CARBON STORAGE UPDATE

8:45 a.m. **Carbon Storage Program Overview**
Traci Rodosta, Carbon Storage Technology Manager, DOE National Energy Technology Laboratory

8:55 a.m. **International Modeling Updates from IEAGHG Network**
James Craig, Manager Technical Programme, and CCS and Regulatory Affairs, Andy Cavanagh, Statoil Norway, Grant Bromhal, National Energy Technology Laboratory, Rajesh Pawar, Los Alamos National Laboratory

PLENARY SESSION – REGIONAL CARBON SEQUESTRATION PARTNERSHIPS LARGE-SCALE PROJECTS

Moderator: Andrea Dunn, Carbon Storage Project Manager

9:30 a.m. **Bell Creek Field Project**
Plains CO_2 Reduction (PCOR) Partnership
Charles Gorecki, Energy and Environmental Research Center, Panel TBD

10:15 a.m. **BREAK**

10:30 a.m. **Illinois Basin - Decatur Project**
Midwest Geological Sequestration Consortium (MGSC)
Rob Finley and Sallie Greenberg – Illinois State Geological Survey, Panel TBD

11:15 a.m. **Michigan Basin Field Project**
Midwest Regional Carbon Sequestration Partnership (MRCSP)
Neeraj Gupta and Darrell Paul – Battelle, Panel TBD

12:00 p.m. **LUNCH – REFLECTIONS AND WATERFRONT**

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PARALLEL SESSIONS

Room	Haselton 1 & 2	Brighton 3 & 4	Ellwood 1 & 2
Session Moderator	**MVA 1 Bill Aljoe**	**Unconventional Reservoirs 1 Josh Hull**	**Reservoir Modeling 1 Karen Kluger**
1:00	Greenhouse Gas Laser Imaging Tomography Experiment (Green Lite) - *ITT Space Systems, LLC*	Enhanced Coal Bed Methane Production and Sequestration of CO2 in Unmineable Coal Seams – *CONSOL, Inc. Research and Development*	Reducing Uncertainties in Model Predictions Via History Matching of CO_2 Migration and Reactive Transport Modeling of CO_2 Fate at the Sleipner Project, Norwegian North Sea - *Trustees of Indiana University*
1:25	Surface and Airborne Monitoring Technology for Detecting Geologic Leakage in a CO_2-Enhanced Oil Recovery Pilot, Anadarko Basin, Texas - *Oklahoma State University*	Central Appalachian Basin Unconventional (Coal/Organic Shale) Reservoir Small Scale CO_2 Injection Test - *Virginia Polytechnic Institute and State University*	Enhanced Simulation Tools to Improve Predictions and Performance of Geologic Storage Coupled Modeling - *Massachusetts Institute of Technology*
1:50	Zero Emissions Research and Technology (ZERT) II - Investigating Fundamental Scientific Issues Affecting the Long-Term Geologic Storage of Carbon Dioxide - *Montana State University*	The Coal-Seq III Consortium: Advancing the Science of CO_2 Sequestration in Coal Seam and Gas Shale Reservoirs - *Advanced Resources International, Inc.*	Simulation of Coupled Processes of Flow, Transport and Storage of CO_2 in Saline Aquifers - *Colorado School of Mines*
2:15	Recovery Act: Measurements of 222Rn, 220Rn, and CO_2 Emissions in Natural CO_2 Fields in Wyoming - *University of Wyoming*	Exploring the Behavior of Shales as Seals and Storage Reservoirs for CO_2 – *National Energy Technology Laboratory*	Enhanced Porosity and Permeability within Carbonate CO_2 Storage Reservoirs: An Experimental and Modeling Study – *Lawrence Livermore National Laboratory*
2:40	Project Synergy Discussion	Utilization in Unconventional Reservoirs - *Pacific Northwest National Laboratory*	Validation of Models Simulating Capillary and Dissolution Trapping - *Trustees of Colorado School of Mines*
3:05	--	Project Synergy Discussion	Project Synergy Discussion
3:15	**BREAK**		

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Room	Haselton 1 & 2	Brighton 3 & 4	Ellwood 1 & 2
Session Moderator	**MVA 2 Erik Albenze**	**Site Characterization Darin Damiani**	**Reservoir Modeling 2 Andrea Dunn**
3:30	In Situ MVA of CO_2 Sequestration Using Smart Field Technology - *West Virginia University Research Corporation*	Recovery Act: Geological Characterization of the South Georgia Rift Basin for Source Proximal CO_2 Storage - *South Carolina Research Institute*	Experimental Design Applications for Modeling and Assessing Carbon Dioxide Sequestration in Saline - *Fusion Petroleum Technologies*
3:55	Pressure-Based Inversion and Data Assimilation System (PIDAS) for CO_2 Leakage Detection - *University of Texas at Austin*	Recovery Act: Characterization of the Triassic Newark Basin of New York & New Jersey for Geologic Storage of Carbon Dioxide - *Sandia Technologies LLC*	Studies for Modeling CO_2 Processes, Comparison, and Joint Inversion with Characterization and Monitoring Data – *Lawrence Berkeley National Laboratory*
4:20	An Advanced Joint Inversion System for Carbon Dioxide Storage Modeling with Large Date Sets for Characterization and Real-Time Monitoring-Enhancing Storage Performance and Reducing Failure Risks under Uncertainties - *Leland Stanford Junior University*	Recovery Act: An Evaluation of the Carbon Sequestration Potential of the Cambro-Ordovician Strata of the Illinois and Michigan Basins - *University of Illinois*	Reactive Transport Models with Geomechanics to Mitigate Risks of Carbon Dioxide Utilization and Storage - *University of Utah*
4:45	Real-Time In-Situ Carbon Dioxide Monitoring Network for Sensitive Subsurface Areas in Carbon Capture and Storage - *Intelligent Optical Systems Inc.*	Recovery Act: Gulf of Mexico Miocene CO_2 Site Characterization Mega Transect - *University of Texas at Austin*	Induced Seismicity - *Lawrence Livermore National Laboratory*
5:10	Project Synergy Discussion	Recovery Act: Characterization of Pliocene and Miocene Formations in the Wilmington Graben, Offshore Los Angeles, for Large Scale Geologic Storage of CO_2 - *Geomechanics Technologies, Inc.*	Integrated Experimental and Modeling Studies of Mineral Carbonation for Permanent CS in Mafic/Ultramafic Rocks
5:35	--	Recovery Act: Modeling CO_2 Sequestration in the Ozark Plateau Aquifer System - *University of Kansas Center for Research*	Project Synergy Discussion

6:00 – 7:30 p.m. **POSTER SESSION – GRAND STATION III–V**

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WEDNESDAY, AUGUST 13, 2014 – GRAND STATION BALLROOM

7:00 a.m. **Meeting Registration**

8:00 a.m. **Welcome and Announcements**
Mary Sullivan, Carbon Storage Project Manager

PLENARY SESSION – CARBON STORAGE UPDATE

Moderator: Karen Kluger, Carbon Storage Project Manager / Mark Ackiewicz

8:05 a.m. **International Monitoring Updates from IEAGHG Network**
Tim Dixon, Manager Technical Programme, and CCS and Regulatory Affairs,
Iain Wright, NOC, Don White, NRCan Canada, Katherine Romanak, BEG USA

8:50 a.m. **U.S. Department of Interior – Bureau of Ocean Energy Management**
Melissa Batum, Senior Program Analyst, U.S. DOI, BOEM

9:20 a.m. **International Organization for Standardization (ISO)**
Steven Carpenter, Advanced Resources International, Head of Delegation at ISO TC-265

9:45 a.m. **BREAK**

PLENARY SESSION – REGIONAL CARBON SEQUESTRATION PARTNERSHIPS LARGE-SCALE PROJECTS (CONTINUED)

Moderator: Mary Sullivan, Carbon Storage Project Manager

10:00 a.m. **Cranfield Field Project**
Southeast Regional Carbon Sequestration Partnership (SECARB)
Jerry Hill – Southern States Energy and Board and Sue Hovorka – University of Texas, BEG, Panel TBD

10:45 a.m. **Plant Berry Citronelle Field Project**
Southeast Regional Carbon Sequestration Partnership (SECARB)
Steve Carpenter – Advanced Resources International, Inc. and Rob Trautz – Electric Power Research Institute, Panel TBD

11:30 a.m. **LUNCH – REFLECTIONS AND WATERFRONT**

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PARALLEL SESSIONS

Room	Haselton 1 & 2	Brighton 3 & 4	Ellwood 1 & 2
Session Moderator	**MVA 3 Andrea Dunn**	**Wellbore Integrity Josh Hull**	**Reservoir Modeling 3 Mary Sullivan**
12:30	Reservoir Performance - *National Energy Technology Laboratory*	Systematic Assessment of Wellbore Integrity for Geologic Carbon Storage Projects Using Regulatory and Industry Information - *Battelle Memorial Institute*	Optimizing Accuracy of Determinations of Carbon Dioxide Storage Capacity and Permanence, and Designing More Efficient Carbon Dioxide Storage - *University of Wyoming*
12:55	Scalable Automated, Semipermanent Seismic Method for Detecting CO_2 Plume Extent During Geological CO_2 Injection - *University of North Dakota*	Statistical Analysis of CO_2 Exposed Wells to Predict Long Term Leakage Through the Development of an Integrated Neural-Genetic-Algorithm - *University of Louisiana at Lafayette*	Model Complexity and Choice of Model Approaches for Practical Simulations of CO_2 Injection, Migration, Leakage, and Long-term Fate - *Trustees of Princeton University*
1:20	Distributed Fiber Optic Arrays: Integrated Temperature and Seismic Sensing for Detection of CO_2 Flow, Leakage and Subsurface Distribution - *Electric Power Research Institute Inc.*	Wellbore and Seal Integrity – *Los Alamos National Laboratory*	Area 2: Inexpensive Monitoring and Uncertainty Assessment of CO_2 Plume Migration - *University of Texas at Austin*
1:45	Deep Controlled Source Electro-Magnetic Sensing: A Cost Effective, Long-Term Tool for Sequestration Monitoring - *Multi Phase Technologies LLC*	Proof of Feasibility of Using Well Bore Deformation as a Diagnostic Tool to Improve CO_2 Sequestration– *Clemson University*	Enhanced Analytical Simulation Tool for CO_2 Storage Capacity Estimation and Uncertainty Quantification - *University of Texas at Austin*
2:10	--	Project Synergy Discussion	--
2:20	**BREAK**		

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Room	Haselton 1 & 2	Brighton 3 & 4	Ellwood 1 & 2
Session Moderator	**MVA 3 (continued) Andrea Dunn**	**Mitigation Darin Damiani**	**Reservoir Modeling 3 (Continued) Mary Sullivan**
2:35	Fundamental Studies - *Lawrence Berkeley National Laboratory*	Wellbore Seal Repair Using Nanocomposite Materials - *University of New Mexico*	Simplified Predictive Models for CO_2 Sequestration Performance Assessment - *Battelle Memorial Institute*
3:00	Prototype and Testing a New Volumetric Curvature Tool for Modeling Reservoir Compartments and Leakage Pathways in the Arbuckle Saline Aquifer: Reducing Uncertainty in CO_2 Storage and Permanence - *University of Kansas Center for Research*	Novel Materials for Robust Repair of Leaky Wellbores in CO_2 Storage Formations - *University of Texas at Austin*	Optimal Model Complexity in Geological Carbon Sequestration: A Response Surface Uncertainty Analysis - *University of Wyoming*
3:25	GEO-SEQ - Support - *Lawrence Berkeley National Laboratory*	Field Test and Evaluation of Engineered Biomineralization Technology for Sealing Existing Wells - *Montana State University*	Project Synergy Discussion
3:50	Development and Test of a 1,000 Level 3C Fiber Optic Borehole Seismic Receiver Array Applied to Carbon Sequestration - *Paulsson Inc*	Project Synergy Discussion	**Risk Assessment Erik Albenze** Development of Improved Caprock Integrity and Risk Assessment Techniques - Geomechanics Technologies, Inc.
4:15	Combining Space Geodesy, Seismology, and Geochemistry for Monitoring, Verification and Accounting of CO2 in Sequestration Sites – *University of Miami*	**Carbon Use/Reuse Darin Damiani** Catalytic Transformation of CO_2 to C1 Products - *National Energy Technology Laboratory*	Nature and Dynamics of the Reservoir/Caprock Contact and Implications for Carbon Storage Performance - *New Mexico Institute of Mining and Technology*
4:40	Project Synergy Discussion	Utilization of CO_2 in High Performance Building and Infrastructure Products – *Solidia*	Developing a Comprehensive Risk Assessment Framework for Geological Storage of CO2 – *University of Texas at Austin - BEG*
5:05	--	**Water Management Karen Kluger** Management of Water from CCS-*Argonne National Laboratory*	Systems Models and Science of CO_2 Sequestration - CO_2PENS - *Los Alamos National Laboratory*
5:30	--	Reservoir Pressure Management - *Lawrence Livermore National Laboratory*	--

6:00 – 7:30 p.m. **POSTER SESSION – GRAND STATION III–V**

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THURSDAY, AUGUST 14, 2014 – GRAND STATION BALLROOM

7:00 a.m. **Meeting Registration**

8:00 a.m. **Welcome and Announcements**
Mary Sullivan, Carbon Storage Project Manager

PLENARY SESSION – REGIONAL CARBON SEQUESTRATION PARTNERSHIPS LARGE-SCALE PROJECTS (CONTINUED)

Moderator: Bill Aljoe, Carbon Storage Project Manager

8:05 a.m. **Farnsworth Unit - Ochiltree Field Project**
Southwest Regional Partnership on Carbon Sequestration (SWP)
Reid Grigg – New Mexico Institute of Mining and Technology and Brian McPherson University of Utah, Panel TBD

8:50 a.m. **Kevin Dome Field Project**
Big Sky Regional Carbon Sequestration Partnership (BSCSP)
Lee Spangler – Montana State University, Panel TBD

9:35 a.m. **BREAK**

PARALLEL SESSIONS

Room	**Haselton 1 & 2**	**Brighton 3 & 4**	**Ellwood 1 & 2**
Session Moderator	**MVA 4** **Bill O'Dowd**	**Small-Scale Field Projects** **Brian Dressel**	**Capacity/Storage Efficiency** **Erik Albenze**
10:00	Natural Geochemical Signals for Monitoring Groundwater Impacts - *National Energy Technology Laboratory*	Small Scale Field Test Demonstrating CO2 Sequestration in Arbuckle Saline Aquifer and by CO2-EOR at Wellington Field, Sumner County, Kansas – *University of Kansas Center for Research, Inc.*	Optimizing and Quantifying CO_2 Storage Resource in Saline Formations and Hydrocarbon Reservoirs - *University of North Dakota*
10:25	D&D of MVA Tools - Gas detection from EOR and coal beds - *Los Alamos National Laboratory*	International Energy Agency Greenhouse Gas Weyburn-Midale CO_2 Monitoring and Storage Program - *Petroleum Technology Research Centre*	Assessing Reservoir Depositional Environments to Develop & Quantify Improvements in CO_2 Storage Efficiency - *University of Illinois*

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10:50	Monitoring of Geological CO_2 Sequestration Using Isotopes and PF Tracers – *Oak Ridge National Laboratory*	Snohvit - *Lawrence Livermore National Laboratory*	Resource Assessment Methods for CO_2 Storage in Geologic Formations - *National Energy Technology Laboratory*
11:15	Radiocarbon as a Reactive Tracer for Tracking Permanent CO_2 Storage in Basaltic Rocks - *Trustees of Columbia University*	Project Synergy Discussion	Commercial Scale CO_2 Injection and Optimization of Storage Capacity in the Southeastern United States - *Advanced Resources International, Inc.*
11:40	Project Synergy Discussion		Project Synergy Discussion

12:00 p.m. **LUNCH – REFLECTIONS AND WATERFRONT**

1:15 p.m. **Concluding Remarks and Future R&D Activities – GRAND STATION BALLROOM**
Traci Rodosta, Carbon Storage Technology Manager, DOE National Energy Technology Laboratory

2:00 p.m. **Meeting Concludes**

NATIONAL RISK ASSESSMENT PROGRAM (NRAP) PUBLIC MEETING – GRAND STATION BALLROOM