



2010 NETL CO₂ Capture Technology Meeting Sheraton Station Square, Pittsburgh, PA



MONDAY, SEPTEMBER 13, 2010 - GRAND STATION I & II

7:00 a.m. **Registration - GRAND STATION FOYER**
Continental Breakfast - GRAND STATION III

OPENING / OVERVIEW

Moderator – *Lynn Brickett*, U.S. Department of Energy, National Energy Technology Laboratory

8:00 a.m. **Introduction**
Lynn Brickett, Director, Existing Plants Division
U.S. Department of Energy, National Energy Technology Laboratory

8:10 a.m. **DOE/NETL Post- and Oxy-combustion CO₂ Capture R&D Program**
Jared Ciferno, Technology Manager, Existing Plants
U.S. Department of Energy, National Energy Technology Laboratory

8:30 a.m. **Introduction of EPA's Program**
Nick Hutson, U.S. Environmental Protection Agency

POST-COMBUSTION SORBENT BASED CAPTURE

Moderator – *Andrew O'Palko*, U.S. Department of Energy, National Energy Technology Laboratory

8:50 a.m. **Metal Monolithic Amine-Grafted Zeolites for CO₂ Capture Power Plants**
Project NT43086
Steven Chuang, University of Akron

9:20 a.m. **Low-Cost Sorbent for Capturing CO₂ Emissions Generated by Existing Coal-Fired Power Plants**
Project NT0005497
Jeannine Elliott, TDA Research, Inc.

9:50 a.m. **BREAK - GRAND STATION III**

10:10 a.m. **Development of Novel Carbon Sorbents for CO₂ Capture**
Project NT0005578
Gopala Krishnan, SRI International

10:40 a.m. **Evaluation of Solid Sorbents as a Retrofit Technology for CO₂ Capture from Coal-Fired Power Plants**
Project NT0005649
Holly Krutka, ADA Environmental Solutions

11:10 a.m. **CO₂ Capture from Flue Gas Using Solid Molecular Basket Sorbents**
Project FE0000458
Xiaoxing Wang, Pennsylvania State University

11:40 a.m. **LUNCH - ADMIRAL ROOM**

Moderator – *David Lang*, U.S. Department of Energy, National Energy Technology Laboratory

1:10 p.m. **Approach to Developing the C2U, a Bench-Scale, Carbon Capture Test Unit Using Supported Amine Sorbents**
Lawrence Shadle, U.S. Department of Energy, National Energy Technology Laboratory – ORD



MONDAY, SEPTEMBER 13, 2010 - GRAND STATION I & II

POST-COMBUSTION SOLVENT BASED CAPTURE

- 1:40 p.m. **Ionic Liquids: Breakthrough Absorption Technology for Post-combustion CO₂ Capture Project NT43091**
Edward Maginn, University of Notre Dame
- 2:10 p.m. **Novel High Capacity Solvents for CO₂ Capture Project NT0005310**
Robert Perry, GE Global Research
- 2:40 p.m. **Reversible Ionic Liquids as Double-Action Solvents for Efficient CO₂ Capture Project NT0005287**
Charles Eckert, Georgia Institute of Technology
- 3:10 p.m. **BREAK - GRAND STATION III**
- 3:30 p.m. **Development and Evaluation of a Novel Integrated Vacuum Carbonate Absorption Process Project NT0005498**
Yongqi Lu, University of Illinois at Urbana-Champaign
- 4:00 p.m. **Development of Chemical Additives for CO₂ Capture Cost Reduction**
Ted Chang, Lawrence Berkley National Laboratory
- 4:30 p.m. **Partnership for CO₂ Capture: Results of Pilot Scale Solvent Evaluations**
Brandon Pavlish, Energy & Environmental Research Center (EERC)
- 5:00 p.m. **ADJOURN**

TUESDAY, SEPTEMBER 14, 2010 - GRAND STATION I & II

- 7:00 a.m. **Registration - GRAND STATION FOYER**
Continental Breakfast - GRAND STATION III

POST-COMBUSTION MEMBRANE BASED CAPTURE

Moderator – *José Figueroa*, U.S. Department of Energy, National Energy Technology Laboratory

- 8:00 a.m. **Membrane Process to Capture Carbon Dioxide from Coal-Fired Power Plant Flue Gas Projects NT0005312 and NT43085**
Tim Merkel, Membrane Technology and Research
- 8:30 a.m. **CO₂ Capture Membrane Process for Power Plant Flue Gas Project NT0005313**
Lora Toy, RTI International

PULVERIZED COAL OXY-COMBUSTION

- 9:00 a.m. **Development of Cost Effective Oxy-combustion Technology for Retrofitting Coal-Fired Boilers Project NT42747**
Hamid Farzan, Babcock & Wilcox Company
- 9:30 a.m. **Characterization of Oxy-combustion Impacts in Existing Coal-Fired Boilers Project NT0005288**
Bradley Adams, Reaction Engineering International

TUESDAY, SEPTEMBER 14, 2010 - GRAND STATION I & II

10:00 a.m. **BREAK - GRAND STATION III**

Moderator – *Tim Fout*, U.S. Department of Energy, National Energy Technology Laboratory

10:20 a.m. **Jupiter Oxy-combustion and Integrated Pollutant Removal for the Existing Coal Fired Power Generation Fleet**
Project NT42811
Manny Menendez, Jupiter Oxygen Corporation

10:50 a.m. **Oxy Combustion Boiler Development for Tangential Firing**
Project NT0005290
Armand Levasseur, Alstom Power, Inc.

11:20 a.m. **Oxygen Transport Membrane Based Oxy-combustion for CO₂ Capture from Coal Power Plants**
Project NT43088
Maxwell Christie, Praxair, Inc.

11:50 a.m. **LUNCH - ADMIRAL ROOM**

1:20 p.m. **Oxy-combustion Boiler Material Development**
Project NT0005262
Archie Robertson, Foster Wheeler North America Corp.

1:50 p.m. **Near Zero Emissions Oxy-combustion Flue Gas Purification**
Project NT0005341
Minish Shah, Praxair, Inc.

2:20 p.m. **Flue Gas Purification Utilizing SO_x/NO_x Reactions during Compression of CO₂ Derived from Oxyfuel Combustion**
Project NT0005309
Kevin Fogash, Air Products and Chemicals, Inc.

2:50 p.m. **BREAK - GRAND STATION III**

ARPA-E PROJECTS

3:10 p.m. **Programs in Carbon Capture Technology**
Mark Hartney, U.S. Department of Energy

4:40 p.m. **ADJOURN**

4:40 - 6:30 p.m. **POSTER SESSION/RECEPTION - GRAND STATION III**

WEDNESDAY, SEPTEMBER 15, 2010 - GRAND STATION I & II

7:00 a.m. **Registration- GRAND STATION FOYER**
Continental Breakfast - GRAND STATION III

NATIONAL CARBON CAPTURE CENTER

Moderator – *Bruce Lani*, U.S. Department of Energy, National Energy Technology Laboratory

8:00 a.m. **National Carbon Capture: Post-Combustion Focus**
Project NT0000749
Doug Maxwell, Southern Company/National Carbon Capture Center

CHEMICAL LOOPING PROCESSES

- 8:30 a.m. **Coal Direct Chemical Looping Retrofit to Pulverized Coal Power Plants for In-Situ CO₂ Capture**
Project NT0005289
Ray Kim, Ohio State University
- 9:00 a.m. **Alstom's Chemical Looping Combustion Prototype for CO₂ Capture from Existing Pulverized Coal-Fired Power Plants**
Project NT0005286
Herb Andrus, Alstom Power, Inc.
- 9:30 a.m. **Clean and Secure Energy from Coal**
Project NT0005015
Adel Sarofim, University of Utah
- 10:00 a.m. **BREAK - GRAND STATION III**

SYSTEMS STUDIES AND MODELING EFFORTS

- 10:20 a.m. **Enegis CO₂ Retrofit Analysis**
Chris Nichols, U.S. Department of Energy, National Energy Technology Laboratory – OSAP
- 10:50 a.m. **Evaluation of CO₂ Capture and Sequestration Using Oxyfuels with AMIGA Economic Modeling**
Richard Doctor, Argonne National Laboratory
- 11:20 a.m. **NETL Modular Framework for Design & Optimization of Carbon Capture Systems**
David Miller, U.S. Department of Energy, National Energy Technology Laboratory – ORD
- 11:50 a.m. **LUNCH - ADMIRAL ROOM**

Moderator – *Mike Mosser, U.S. Department of Energy, National Energy Technology Laboratory*

- 1:20 a.m. **Cost Reduction and R&D Strategies for Advanced Oxyfuel Technologies**
Michael Matuszewski, U.S. Department of Energy, National Energy Technology Laboratory – OSAP

CO₂ COMPRESSION

- 1:50 p.m. **CO₂ Compression Using Super Sonic Shock Wave Technology**
Project NT42651
Shawn P. Lawlor, Ramgen Power Systems
- 2:20 p.m. **Novel Concepts for the Compression of Large Volumes of CO₂**
Project NT42650
Jeffery Moore, Southwest Research Institute
- 2:50 p.m. **BREAK - GRAND STATION III**

NEW CO₂ CAPTURE PROJECTS

Moderator – *Andrew Jones, U.S. Department of Energy, National Energy Technology Laboratory*

- 3:10 p.m. **CO₂ Capture by Sub-Ambient Membrane Operation**
Sudhir Kulkarni, American Air Liquide (DRTC)

WEDNESDAY, SEPTEMBER 15, 2010 - GRAND STATION I & II

- 3:30 p.m. **Hybrid Membrane/Absorption Process for Post-combustion CO₂ Capture**
Shaojun Zhou, Gas Technology Institute
- 3:50 p.m. **Post-combustion CO₂ Capture for Existing PC Boilers by Self-Concentrating Amine Absorbent**
Liang Hu, 3H Company, Inc.
- 4:10 p.m. **Advanced Low Energy Enzyme Catalyzed Solvent for CO₂ Capture**
Paul Gifford, Akermin, Inc.
- 4:30 p.m. **Novel Solvent System for CO₂ Capture**
Claude Corkadel, ION Engineering LLC
- 4:50 p.m. **Evaluation of Concentrated Piperazine for CO₂ Capture from Coal-Fired Flue Gas**
Katherine Dombrowski, URS Corporation
- 5:10 p.m. **ADJOURN**

THURSDAY, SEPTEMBER 16, 2010 - GRAND STATION I & II

- 7:00 a.m. **Registration - GRAND STATION FOYER**
Continental Breakfast - GRAND STATION III

NEW CO₂ CAPTURE PROJECTS – CONT'D

Moderator – *Andrew Aurelio*, U.S. Department of Energy, National Energy Technology Laboratory

- 8:00 a.m. **Slipstream Testing of a Membrane CO₂ Capture Process for Existing Coal-Fired Power Plants**
Tim Merkel, Membrane Technology and Research, Inc.
- 8:20 a.m. **Slipstream Development and Testing of Post-combustion Carbon Dioxide Capture and Separation Technology for Application to Existing Coal-Fired Power Plants – Big Bend Station**
John Winkler, Siemens Energy, Inc.
- 8:40 a.m. **Evaluation of Solid Sorbents as a Retrofit Technology for CO₂ Capture from Coal-Fired Power Plants**
Sharon Sjostrom, ADA Environmental Solutions

CCPI AND ICCS DEMONSTRATION PROJECTS

Moderator – *Anthony Zinn*, U.S. Department of Energy, National Energy Technology Laboratory

- 9:00 a.m. **W.A. Parish CCS Demonstration Project**
Project FE0003311
Tim Simonson, Fluor Enterprises, Inc.
- 9:20 a.m. **Demonstration of CO₂ Capture and Sequestration of Steam Methane Reforming Process Gas for Large-Scale Hydrogen Production**
Project FE0002381
Kenneth Welch, Air Products and Chemicals, Inc.
- 9:40 a.m. **BREAK - GRAND STATION III**
- 10:00 a.m. **Mountaineer Commercial Scale CO₂ Capture and Storage Project**
Project FE0002673
Brian Sherrick, American Electric Power

THURSDAY, SEPTEMBER 16, 2010 - GRAND STATION I & II

- 10:20 a.m. **Lake Charles CCS Project**
Project FE0002314
Doug Cathro, Leucadia Energy, LLC
- 10:40 a.m. **CO₂ Capture at the Kemper County IGCC Project**
Project NT42391
Matt Nelson, Southern Company
- 11:00 a.m. **Hydrogen Energy California (HECA) Project**
Project FE0000663
Maha Mahasenan, Hydrogen Energy California LLC
- 11:20 a.m. **Texas Clean Energy Project: Carbon Capture using the Rectisol Process**
Project FE0002650
Barry Cunningham, Summit Power Group, Inc.

11:40 a.m. **LUNCH - ADMIRAL ROOM**

PRE-COMBUSTION CAPTURE PROJECTS

Moderator – *Meghan Napoli*, U.S. Department of Energy, National Energy Technology Laboratory

- 1:10 p.m. **DOE/NETL Pre-combustion CO₂ Capture Program**
Sean Plasynski, Technology Manager, Sequestration
U.S. Department of Energy, National Energy Technology Laboratory – ORD
- 1:30 p.m. **National Carbon Capture Center: Pre-Combustion Focus**
Project NT0000749
John Wheeldon, National Carbon Capture Center
- 2:00 p.m. **Fabrication and Scale-up of Polybenzimidazole (PBI) Membrane Based System**
Project NT43090
Gopala Krishnan, SRI International
- 2:30 p.m. **Hydrogen Selective Exfoliated Zeolite Membranes**
Project FE0001322
Michael Tsapatsis, University of Minnesota
- 3:00 p.m. **BREAK - GRAND STATION III**
- 3:20 p.m. **Combinatorial Design of Ternary Pd Alloys for Hydrogen Separation**
Project FE0001181
Daniel Henkel, Pall Corporation
- 3:50 p.m. **CO₂ Capture from IGCC Gas Streams Using AC-ABC Process**
Project FE0000896
Gopala Krishnan, SRI International
- 4:20 p.m. **Evaluation of Dry Sorbent Technology**
Project FE0000465
Carl Richardson, URS Group and Yongqi Lu, University of Illinois at Urbana-Champaign
- 4:50 p.m. **ADJOURN**

FRIDAY, SEPTEMBER 17, 2010 - GRAND STATION I & II

7:00 a.m. **Registration - GRAND STATION FOYER**
Continental Breakfast - GRAND STATION III

PRE-COMBUSTION CAPTURE PROJECTS – CONT'D

Moderator – *Richard Dunst*, U.S. Department of Energy, National Energy Technology Laboratory

8:00 a.m. **Pre-Combustion Carbon Capture by a Nanoporous, Superhydrophobic Membrane Contractor**
Project FE0000646
Shaojun Zhou, Gas Technology Institute

8:30 a.m. **Novel Polymer Membrane Process**
Project FE0001124
Tim Merkel, Membrane Technology and Research, Inc.

9:00 a.m. **Integrated Computational and Experimental Approaches to Ionic Liquid Development for Pre-combustion Solvents and Membranes**
David Luebke, U.S. Department of Energy, National Energy Technology Laboratory – ORD

9:30 a.m. **Carbon Capture Research in the Energy Frontier Research Center**
Berend Smit, University of California, Berkeley

10:00 a.m. **BREAK - GRAND STATION III**

10:20 a.m. **Pressure Swing Absorption Device**
Project FE0001323
Kamalesh Sirkar, New Jersey Institute of Technology

10:50 a.m. **Low Cost, High Capacity Regenerable Sorbent**
Project FE0000469
Gokhan Alptekin, TDA Research, Inc.

11:20 a.m. **Pre-Combustion CO₂ Capture with Dual-Phase Ceramic Carbonate Membrane Reactor**
Project FE0000470
Jerry Lin, Arizona State University

11:50 p.m. **ADJOURN/LUNCH**