ADDRESSING THE NATION’S ENERGY NEEDS THROUGH TECHNOLOGY INNOVATION

2019 Carbon Capture, Utilization, Storage, and Oil & Gas Technologies Integrated Review Meeting

August 26–30, 2019
Welcome to Pittsburgh!

On behalf of the National Energy Technology Laboratory (NETL), I would like to personally welcome you to the City of Pittsburgh and the 2019 Carbon Capture, Utilization, Storage and Oil and Gas Technologies Integrated Review Meeting. I appreciate you taking the time to visit our city and participate in this five-day event designed to explore the exciting and cutting-edge research being conducted by NETL and our many talented research partners.

The City of Pittsburgh has a long history of developing groundbreaking technologies that have had a dramatic impact on our world, such as the first commercial radio station, the first retractable domed roof, and our nation’s first commercial nuclear reactor. Today, Pittsburgh continues to host and foster unparalleled collaborations with research and technology partners across diverse sectors to drive innovation. These innovations will forge a resilient and sustainable future and ensure regional and global energy security and prosperity.

NETL shares this same innovative vision, driving our mission, to discover, integrate, and mature technology solutions to enhance the nation’s energy foundation and protect the environment for future generations. For more than 100 years, NETL has developed tools and processes to provide clean, reliable, and affordable energy to the American people.

The 2019 Carbon Capture, Utilization, Storage and Oil and Gas Technologies Integrated Review Meeting brings together some of the best research talent in the country who are working to solve some of our greatest energy-related challenges. Over the next five days, researchers and scientists will highlight some of the most advanced research currently underway. Each of these areas can and will be impactful, both domestically and internationally.

We hope you enjoy this rare opportunity to share in the research efforts of these four combined programs in a single interactive event. I invite you to explore our city while you are here and to enjoy the program we have put together.

Once again, welcome to Pittsburgh and enjoy your visit!

Sincerely,

Brian J. Anderson, Ph.D.
Director
National Energy Technology Laboratory
MONDAY MORNING SESSION

7:00 AM Meeting Registration/Continental Breakfast – Ballroom Foyer
8:00 AM Welcome/Introduction – Ballroom A
8:10 AM Steven Winberg, Assistant Secretary for Fossil Energy, U.S. Department of Energy
8:40 AM Introduction
8:45 AM Brian Anderson, Director, National Energy Technology Laboratory
9:15 AM CCUS: Current Business Cases
10:00 AM Break
Monday

Capture and Utilization Session

4th Floor, Room 406

Capture - Lab/Bench-Scale Research

Moderator: Jose Figueroa, NETL

10:30 AM Bench-Scale Testing of Next-Generation Hollow-Fiber Membrane Modules (FE0026422)
- Shilu Fu, American Air Liquide Inc.

10:50 AM Energy-Efficient GO-PEEK Hybrid Membrane Process for Post-Combustion Carbon Dioxide Capture (FE0026383)
- Shiquang Li, Gas Technology Institute

11:10 AM Novel Process That Achieves 10 MOL/KG Sorbent Swing Capacity in a Rapidly Cycled Pressure Swing Adsorption Process (FE0026433)
- Ryan Lively, Georgia Institute of Technology

11:30 AM Cryogenic Carbon Capture Development (FE0028697)
- Larry Baxter, Sustainable Energy Solutions

11:50 AM Electrochemically Mediated Amine Regeneration in CO₂ Scrubbing Processes (FE0026489)
- T. Alan Hatton, Massachusetts Institute of Technology

12:10 PM Rapid Design and Testing of Novel Gas-Liquid Contacting Devices for Post-Combustion CO₂ Capture Via 3D Printing: Modular Adaptive Packing (FE0031530)
- Erik Meuleman, ION Engineering LLC

12:30 PM Lunch

Moderator: Andrew Jones, NETL

1:30 PM Development and Bench-Scale Testing of a Novel Biphasic Solvent-Enabled Absorption Process for Post-Combustion Carbon Capture (FE0031600)
- Yongli Li, University of Illinois at Urbana-Champaign

1:50 PM A Process with Decoupled Absorber Kinetics and Solvent Regeneration through Membrane Dewatering and In-Column Heat Transfer (FE0031604)
- James Landon, University of Kentucky

2:10 PM Universal Solvent Viscosity Reduction Via Hydrogen Bonding Disruptors (FE0031629)
- Xu Zhou, Liquid Ion Solutions LLC

2:30 PM ROTA-CAP: An Intensified Carbon Capture System Using Rotating Packed Beds (FE0031630)
- Osman Akpolat, Gas Technology Institute

2:50 PM Mixed-Salt Based Transformational Solvent Technology for CO₂ Capture (FE0031597)
- Palitha Jayaweera, SRI International

3:10 PM Development of Self-Assembly Isoporous Membranes (FE0031596)
- Hans Wijmans, Membrane Technology and Research (MTR) Inc.

3:30 PM Break

Plains and Northwest 1

Moderator: Bill Aljoe, NETL | Ballroom B

10:30 AM Plains CO₂ Reduction Partnership and Phase III (FC26-05NT42592)
- Charles D. Gorecki, University of North Dakota Energy and Environmental Research Center (Aljoe)

11:00 AM Big Sky Regional Carbon Sequestration Partnership – Phase III (FC26-05NT42587)
- Lee Spangler, Montana State University, Energy Research Institute (Aljoe)

11:30 AM EERC-DOE Joint Program on Research and Development for Fossil Energy-Related Resources; Subtask 3.1: Related Resources: Bakken-Rich Gas EOR Center (FE0024232)
- James Sorensen, University of North Dakota Energy and Environmental Research Center (Covatch)

12:00 PM First-Ever Field Pilot on Alaska’s North Slope to Validate the Use of Polymer Floods for Heavy Oil Enhanced Oil Recovery (FE0031606)
- Abhijit Dandekar, University of Alaska - Fairbanks (Cercone)

12:30 PM Lunch – Ballroom A

Plains and Northwest 2

Moderator: Bill O’Dowd, NETL | Ballroom B

1:30 PM North Dakota Integrated Carbon Storage Complex Feasibility Study (FE0029488)
- Wesley Peck, University of North Dakota Energy and Environmental Research Center (O’Dowd)

2:00 PM Integrated Midcontinent Stacked Carbon Storage Hub (FE0031623)
- Andrew Dupuid, Battelle Memorial Institute (McNemar)

2:30 PM Commercial-Scale Carbon Storage Complex Feasibility Study at Dry Fork Station, Wyoming (FE0031624)
- Scott Quillinan, University of Wyoming (O’Dowd)

3:00 PM Developing and Validating Pressure Management and Plume Control Strategies in the Williston Basin Through a Brine Extraction and Storage Test (FE0026160)
- John Hamling, University of North Dakota Energy and Environmental Research Center (McNemar)

3:30 PM Break – Ballroom Foyer

Oil & Gas Projects
### CAPTURE AND UTILIZATION SESSION

**CAPTURE – LAB/BENCH-SCALE RESEARCH**

**Moderator:** Andrew O’Palko, NETL

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>4:00 PM</td>
<td><strong>Bench-Scale Development of a Transformational Graphene Oxide-Based Membrane Process for Post-Combustion CO₂ Capture (FE0031598)</strong>&lt;br&gt;  - Shiguang Li, Gas Technology Institute</td>
</tr>
<tr>
<td>4:20 PM</td>
<td><strong>Flue Gas Aerosol Pretreatment Technologies to Minimize PCC Solvent Losses (FE0031592)</strong>&lt;br&gt;  - Devin Bostick, Linde LLC</td>
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<tr>
<td>4:40 PM</td>
<td><strong>Development of Carbon Molecular Sieves Hollow Fiber Membranes Based on Polybenzimidazole Doped with Polyprotic Acids with Superior H₂/CO₂ Separation Properties (FE0031636)</strong>&lt;br&gt;  - Haiqing Lin, University at Buffalo, SUNY</td>
</tr>
<tr>
<td>5:00 PM</td>
<td><strong>Emissions Mitigation Technology for Advanced Water-Lean Solvent-based CO₂ Capture Processes (FE0031668)</strong>&lt;br&gt;  - Jak Tandana, Research Triangle Institute</td>
</tr>
<tr>
<td>5:20 PM</td>
<td><strong>Adjourn Capture and Utilization Session</strong></td>
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<td>6:00 PM</td>
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### MONITORING 1

**Moderator:** Jerry Carr, NETL

3rd Floor, Rooms 303, 304, 305

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<tbody>
<tr>
<td>4:00 PM</td>
<td><strong>Task 5: Advances in Large-N Seismic Measurements to Monitor Reservoir Behavior (FWP-FEW0191)</strong>&lt;br&gt;  - Eric Matzel, Lawrence Livermore National Laboratory (McNemar)</td>
</tr>
<tr>
<td>4:20 PM</td>
<td><strong>Task 3: Assessment of Leakage Pathways Using Joint EM-Seismic Borehole and Surface Technologies</strong>&lt;br&gt;  - Michael Witt and Pierpaolo Marchesini, Lawrence Berkeley National Laboratory (Carr)</td>
</tr>
<tr>
<td>4:40 PM</td>
<td><strong>Task 2: 2nd Generation SOV DAS (FWP-ESD14095)</strong>&lt;br&gt;  - Julia Correa, Lawrence Berkeley National Laboratory (Carr)</td>
</tr>
<tr>
<td>5:00 PM</td>
<td><strong>Task 4 Monitoring Technology for Deep CO₂ Injection (FWP-ESD14095)</strong>&lt;br&gt;  - Michael Messerly, Lawrence Livermore National Laboratory (Carr)</td>
</tr>
<tr>
<td>5:20 PM</td>
<td><strong>Task 2: Monitoring for Small Leaks over Large Areas (FWP-FE-890-18-FY18)</strong>&lt;br&gt;  - Youzuo Lin, Los Alamos National Laboratory (Hull)</td>
</tr>
<tr>
<td>5:40 PM</td>
<td><strong>National Risk Assessment Partnership Task 6: Risk-Based Approach to Post-Injection Site Closure</strong>&lt;br&gt;  - Bob Dilmore, National Energy Technology Laboratory (Underwood)</td>
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<td>6:00 PM</td>
<td><strong>End of Day</strong></td>
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### NATIONAL LAB FUNDAMENTAL SHALE RESEARCH

**Moderator:** Bruce Brown, NETL

3rd Floor, Rooms 301, 302

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<th>Time</th>
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<tr>
<td>4:00 PM</td>
<td>Numerical and Laboratory Investigations for Maximization of Production from Tight/Shale Oil Reservoirs (FWP-FP000008115)&lt;br&gt;  - George Montidis, Lawrence Berkeley National Laboratory (Henry)</td>
</tr>
<tr>
<td>4:20 PM</td>
<td>Fundamentals of Unconventional Reservoirs Research (FWP-FE-406-408-409)&lt;br&gt;  - George Guthrie, Los Alamos National Laboratory (Brown)</td>
</tr>
<tr>
<td>4:40 PM</td>
<td>Fundamental Chemical and Mechanical Processes for Unconventional Formations (FWP-1022415)&lt;br&gt;  - Ali Halals, National Energy Technology Laboratory</td>
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<tr>
<td>5:00 PM</td>
<td>Chemical Control of Fluid Flow and Contaminant Release in Shale Microfractures (FWP-100211)&lt;br&gt;  - John Bargari, SLAC National Accelerator Laboratory (Cercone)</td>
</tr>
<tr>
<td>5:20 PM</td>
<td>Improved Unconventional Reservoir Stimulation Through Understanding and Enhancing Gravity-Assisted Recovery of Fluids (FWP-FP00008256)&lt;br&gt;  - Tetsu Tokunaga, Lawrence Berkeley National Laboratory (Henry)</td>
</tr>
<tr>
<td>5:40 PM</td>
<td>Controlling Sustainability of Hydraulic Fracture Permeability in Ductile Shales (FWP-FP0008114)&lt;br&gt;  - Seiji Nakagawa, Lawrence Berkeley National Laboratory (Henry)</td>
</tr>
<tr>
<td>6:00 PM</td>
<td>End of Day</td>
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TUESDAY
MORNING SESSION
BALLROOM A

7:00 AM  Continental Breakfast
8:00 AM  Introduction/Welcome
8:05 AM  Regulation Discussion – 45Q
8:25 AM  CCUS Federal Financing Mechanisms
9:25 AM  Stakeholder Perspectives – The Future of CCUS
10:10 AM Break
TUESDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CAPTURE – LAB/BENCH-SCALE RESEARCH
Moderator: David Lang, NETL

10:30 AM  Advancing Post-Combustion CO₂ Capture Through Increased Mass Transfer (FE0031661)
  • Jesse Thompson, University of Kentucky – CAER

10:50 AM  Molecular Refinement of Transformational Solvents for CO₂ Separations (PWP-72396)
  • David Heldebrant, Pacific Northwest National Laboratory

11:10 AM  Inexpensive and Sustainable Anti-Corrosion Coating for Power Generation Applications (FE0031659)
  • John Watkins, Lumishield Technologies Incorporated

11:30 AM  Membrane Development for Post-Combustion Carbon Capture
  • David Hopkinson, U.S. Department of Energy, National Energy Technology Laboratory

11:50 AM  Physical Solvent Development for Pre-Combustion Carbon Capture
  • Nicholas Siefert, U.S. Department of Energy, National Energy Technology Laboratory

12:10 PM  Discovery of New Materials for Carbon Capture by Computational Screening
  • Jan Steckel, U.S. Department of Energy, National Energy Technology Laboratory

12:30 PM  Lunch

Moderator: Katharina Daniels, NETL

1:30 PM  Novel CO₂-Selective Membranes for CO₂ Capture from less than 1% CO₂ Sources (FE0026919)
  • Yang Han and Winston Ho, The Ohio State University

1:50 PM  Zeolite Membrane Reactor for Pre-Combustion Carbon Dioxide Capture (FE0026435)
  • Jerry Lin, Arizona State University

2:10 PM  Transformational Membranes for Pre-Combustion Carbon Capture (FE0031635)
  • Yang Han and Winston Ho, The Ohio State University

2:30 PM  Bench-Scale Development of a Transformative Membrane Process For Pre-Combustion CO₂ Capture
  (FE0031632)
  • Jay Kniep, Membrane Technology and Research Inc.

2:50 PM  Development of Pre-Combustion CO₂ Capture Process Using High-Temperature PBI (FE0031633)
  • Indira Jayaweera, SRI International

3:10 PM  A High-Efficiency, Ultra-Compact Process for Pre-Combustion CO₂ Capture (FE0026423/FE0031737)
  • Theodore Tsotsis, University of Southern California

3:30 PM  Break

TUESDAY
SUBSURFACE PLENARY

SOUTHEAST REGION 1
Moderator: Mary Sullivan, NETL | Ballroom B

10:30 AM  Tuscaloosa Marine Shale Laboratory (FE0031575)
  • Mehdi Mokhtari, University of Louisiana at Lafayette (Brown)

11:00 AM  Marcellus Shale Energy and Environment Laboratory (FE0024297)
  • Timothy Carr, West Virginia University (Vagnetti)

11:30 AM  Southeast Regional Carbon Sequestration Partnership (Cranfield) – Phase III (FC26-05NT42590)
  • Sue Hovorka, University of Texas at Austin (Sullivan)

12:00 PM  Southeast Regional Carbon Sequestration Partnership (Citronelle) – Phase III (FC26-05NT42590)
  • Kenneth Nemeth, Southern States Energy Board (Sullivan)

12:30 PM  Lunch – Ballroom A

SOUTHEAST REGION 2
Moderator: Mary Sullivan, NETL | Ballroom B

1:30 PM  Establishing an Early Carbon Dioxide Storage Complex in Kemper County, Mississippi: Project ECO2S
  (FE0029465)
  • Dave Riestenberg, Advanced Resources International (Sullivan)

2:00 PM  Gulf Coast Field Demonstration at a Flagship Power Plant to Assess Optimal Reservoir Pressure Control,
  Plume Management and Produced Water Strategies (FE0026140)
  • Robert Trautz, Electric Power Research Institute Inc. (Hull)

2:30 PM  Offshore Gulf of Mexico Partnership for Carbon Storage – Resources and Technology Development
  (FE0031558)
  • Susan Hovorka, University of Texas at Austin (Sullivan)

3:00 PM  Southeast Regional Carbon Storage Partnership: Offshore Gulf of Mexico (FE0031557)
  • Michael Godec, Advanced Resources International (Sullivan)

3:30 PM  Break – Ballroom Foyer

Oil & Gas Projects

TUESDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CAPTURE – LAB/BENCH-SCALE RESEARCH
Moderator: David Lang, NETL

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  • Jan Steckel, U.S. Department of Energy, National Energy Technology Laboratory

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3:10 PM  A High-Efficiency, Ultra-Compact Process for Pre-Combustion CO₂ Capture (FE0026423/FE0031737)
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3:30 PM  Break

TUESDAY
SUBSURFACE PLENARY

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Moderator: Mary Sullivan, NETL | Ballroom B

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SOUTHEAST REGION 2
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1:30 PM  Establishing an Early Carbon Dioxide Storage Complex in Kemper County, Mississippi: Project ECO2S
  (FE0029465)
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  • Susan Hovorka, University of Texas at Austin (Sullivan)

3:00 PM  Southeast Regional Carbon Storage Partnership: Offshore Gulf of Mexico (FE0031557)
  • Michael Godec, Advanced Resources International (Sullivan)

3:30 PM  Break – Ballroom Foyer

Oil & Gas Projects
TUESDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CAPTURE – LAB/BENCH-SCALE RESEARCH
Moderator: Sai Gollakota, NETL

4:00 PM
High-Temperature Ceramic-Carbonate Dual-Phase Membrane Reactor for Pre-Combustion Carbon Dioxide Capture (FE0031634)
- Jerry Lin, Arizona State University

4:20 PM
Sorption-Enhanced Mixed Matrix Membranes for Hydrogen Purification and Carbon Dioxide Capture (FE0026463)
- Haixing Lin, University at Buffalo, SUNY

CARBON CAPTURE SIMULATION FOR INDUSTRY IMPACT (CCSI²)
Moderator: Sai Gollakota, NETL

4:40 PM
Maximizing Learning Through Intelligent Test Design
- Christine Anderson-Cook, Los Alamos National Laboratory

5:00 PM
Computational Support for Low Aqueous Solvent System Pilot Testing
- Josh Morgan, West Virginia University

5:20 PM
Adjourn Capture and Utilization Session

6:00 PM
End of Day

TUESDAY
SUBSURFACE BREAKOUT

MONITORING 2
Moderator: Kyle Smith, NETL
3rd Floor, Rooms 303, 304, 305

4:00 PM
Charged Wellbore Casing Controlled Source Electromagnetics for Reservoir Imaging and Monitoring (FE0028320)
- Yaoguo Li, Colorado School of Mines (Underwood)

4:20 PM
New Imaging and CO₂ Storage Technologies for Unconventional Subsurface Reservoirs (FWP-70066)
- Bernard McGrail, Pacific Northwest National Laboratory (Cercone)

4:40 PM
Integration of Seismic-Pressure-Petrophysics Inversion of Continuous Active-Seismic Monitoring Data for Monitoring and Quantifying CO₂ Plume (FE0031544)
- Tieyuan Zhu, Pennsylvania State University (O’Dowd)

5:00 PM
Joint Inversion of Time-Lapse Seismic Data (FE0031540)
- César Barajas-Orlaide, University of North Dakota Energy and Environment Research Center (Carr)

5:20 PM
Robust Carbon Dioxide Imaging Using Joint Tomographic Inversion of Seismic Onset Time and Distributed Pressure and Temperature Measurements (FE0031425)
- Aashil Datayuppa, Texas A&M Engineering Experiment Station (Hull)

5:40 PM
Novel Geochemical Signals for Monitoring CO₂ and Brine Impacts in Groundwater Systems
- Christina Lopano and Ale Hakala, National Energy Technology Laboratory

6:00 PM
End of Day

HYDRAULIC FRACTURING TECHNOLOGIES
Moderator: Steve Henry, NETL
3rd Floor, Rooms 301, 302

4:00 PM
Passive Acoustic Metamaterial Proppants for Advanced Hydraulic Fracture Diagnostics (SCE0017738)
- Jacob Pollock, Oceanit Laboratories Inc. (Henry)

4:20 PM
Development and Field Testing Novel Natural Gas Surface Process Equipment for Replacement of Water as Primary Hydraulic Fracturing Fluid (FE0024314)
- Griffin Beck, Southwest Research Institute (Renk)

4:40 PM
A New Framework for Microscopic to Reservoir-Scale Simulation of Hydraulic Fracturing and Production: Testing with Comprehensive Data from HF/TS and Other Hydraulic Fracturing Field Test Sites (FWP-100480/FWP-FEW0250/FWP-FP0008049)
- Jens Birkholzer, Lawrence Berkeley National Laboratory; Joe Morris, Lawrence Livermore National Laboratory (Renk)

5:00 PM
Enhancing Unconventional Reservoir Ultimate Recoveries with In-Situ Nano-Catalysts (TCF-18-15390)
- Randall Winsans, Argonne National Laboratory (Cercone)

5:20 PM
Injection and Tracking of Micro Seismic Emitters to Optimize Unconventional Oil and Gas Development (FE0024360)
- Bjorn Paulsson, Paulsson Inc. (Fincham)

5:40 PM
Development of a Low-Noise Optical Interrogator for Interferometric Sensing Technologies (SC0017729)
- Bjorn Paulsson, Paulsson Inc. (Fincham)

6:00 PM
End of Day

Oil & Gas Projects
7:00 AM
Continental Breakfast
WEDNESDAY

SUBSURFACE PLENARY
TEXAS REGION
Moderator: Gary Covatch, NETL | Ballroom B

8:00 AM
Hydraulic Fracturing Test Site I, Midland Basin, West Texas (FE0024292)
- Jordan Ciezobka, Gas Technology Institute (Covatch)

8:30 AM
Eagle Ford Shale Laboratory South Texas (FE0031579)
- A. Dan Hill, Texas A&M University (Renk)

9:00 AM
Hydraulic Fracturing Test Site II, Delaware Basin, West Texas (FE0031577)
- Jordan Ciezobka, Gas Technology Institute (Covatch)

9:30 AM
Southwest Regional Partnership Phase 3: Transition to Post-Injection Monitoring of CCUS in an Active Oil Field (FC26-05NT42591)
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration (O'Dowd)

10:00 AM
Break – Ballroom Foyer

MIDWEST REGION
Moderator: Andrea McNemar, NETL | Ballroom B

10:30 AM
Midwest Regional Carbon Sequestration Partnership (FC26-05NT42589)
- Neeraj Gupta, Battelle Memorial Institute (McNemar)

11:00 AM
Midwest Geological Sequestration Consortium Update (FC26-05NT42588)
- Sallie Greenberg, University of Illinois (Aljoe)

11:30 AM
Wabash CarbonSAFE (FE0031626)
- Christopher Korose, University of Illinois at Urbana-Champaign (Aljoe)

12:00 PM
CarbonSAFE Illinois Christian County (FE0029381)
- Steve Whitaker, Illinois State Geological Survey (Aljoe)

12:30 PM
Lunch – Ballroom A

Oil & Gas Projects
**CAPTURE AND UTILIZATION SESSION**

**CAPTURE – PILOT-SCALE RESEARCH**

**Moderator: Timothy Fout, NETL**

11:50 AM  
Advanced Carbon Capture Testing at the National Carbon Capture Center (FE0022596)  
- Michele Coren, Southern Company

12:10 PM  
Pilot Test of a Nanoporous, Super-Hydrophobic Membrane Contactor Process for Post-Combustion Carbon Dioxide Capture (FE0012829)  
- Shiquang Li, Gas Technology Institute

12:30 PM  
Lunch

**Moderator: Naomi O’Neil, NETL**

1:30 PM  
Pilot-Scale Slipstream Testing of Sorbent-Based CO₂ Capture Process (FE0012870)  
- Jeannine Elliott, TDA Research Inc.

1:50 PM  
Pilot Testing of a Highly Effective Pre-Combustion Sorbent-Based Carbon Capture System (FE0013105)  
- Gokhan Alptekin, TDA Research Inc.

2:10 PM  
Application of a Heat-Integrated Post-Combustion Carbon Dioxide Capture System with Hitachi Advanced Solvent into Existing Coal-Fired Power Plant (FE0007397)  
- Heather Nikolic, University of Kentucky Center for Applied Energy Research

2:30 PM  
Engineering-Scale Demonstration of the Mixed-Salt Process for CO₂ (FE0031588)  
- Indira Jayaweera, SRI International

3:00 PM  
Break

**SUBSURFACE BREAKOUT**

**MONITORING 3**

**Moderator: Jerry Carr, NETL**

3rd Floor, Rooms 303, 304, 305

1:30 PM  
Active Seismic Monitoring of CO₂ Leakage Through a Hydromechanically Reactivated Fault Caprock Integrity Monitoring for a Geological Carbon Sequestration Site Analog: Validating a CASSM Monitoring System (FWP-FP00007630)  
- Yves Guglielmi or Jens Birkholzer, Lawrence Berkeley National Laboratory (Carr)

1:50 PM  
RIC Task 25: Long-Period, Long-Duration (LPLD) Seismic Events Observed at Two CO₂ EOR Locations  
- Rick Hammack, National Energy Technology Laboratory (Goodman)

2:10 PM  
National Risk Assessment Partnership: Strategic Monitoring for Uncertainty Reduction  
- Erika Gasperikova, Lawrence Berkeley National Laboratory (Underwood)

2:30 PM  
Monitoring of Geological CO₂ Sequestration Using Isotopes and PF Tracers (FWP-FEAA045)  
- David Graham, Oak Ridge National Laboratory (Carr)

3:00 PM  
Break

**OFFSHORE**

**Moderator: Bill Fincham, NETL**

3rd Floor, Rooms 301, 302

1:30 PM  
Field Validation of MVA Technology for Offshore CCS: Novel Ultra-High-Resolution 3D Marine Seismic Technology (P-Cable) (FE0028193)  
- Tip Meckel, University of Texas at Austin (Carr)

2:10 PM  
Hexagonal Boron Nitrate Reinforced Multifunctional Well Cement for Extreme Conditions (FE0031574)  
- Rouzbeh Shahsavari, C-Crete Technologies Inc. (Fincham)

3:00 PM  
The NETL Oil and Gas Offshore Research Portfolio  
- Kelly Rose, National Energy Technology Laboratory

4TH FLOOR, ROOM 406
WEDNESDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CAPTURE – PILOT-SCALE RESEARCH
Moderator: Andrew O’Palko, NETL

3:15 PM Scale-Up and Testing of Advanced Polaris Membrane CO₂ Capture Technology (FE0031591)
- Tim Merkel, Membrane Technology and Research Inc.

3:45 PM Engineering Scale Testing of Transformational Non-Aqueous Solvent-Based Carbon Dioxide Capture Process at Technology Centre Mongstad (FED031590)
- Shaojun “James” Zhou, Research Triangle Institute

4:15 PM Membrane-Sorbent Hybrid System for Post-Combustion Carbon Capture (FE0031603)
- Gokhan Alptekin, TDA Research Inc.

4:45 PM End of presentations

5:00 PM Poster Session

6:30 PM End of Day

WEDNESDAY
SUBSURFACE BREAKOUT

GEOLOGIC STORAGE
Moderator: Mary Underwood, NETL
3rd Floor, Rooms 303, 304, 305

3:30 PM National Risk Assessment Partnership Task 2: Containment Assurance
- Dylan Harp, Los Alamos National Laboratory (Underwood)

3:50 PM Task 4: Active Reservoir Management (FEW-0191)
- Thomas Buscheck, Lawrence Livermore National Laboratory (McNemar)
- Neeraj Gupta, Battelle Memorial Institute (O’Dowd)

4:10 PM National Risk Assessment Partnership Task 4: Application of Risk Assessment Tools and Methodologies to Synthetic and Field Data
- Diana Bacon, Pacific Northwest National Laboratory (Underwood)

4:30 PM Development of Defensible CO₂ Storage Methods and Tools to Quantify Prospective Storage in the Subsurface
- Angela Goodman and Kelly Rose, National Energy Technology Laboratory

5:00 PM Poster Session – Ballroom Foyer

6:30 PM End of Day

OFFSHORE
Moderator: Bill O’Dowd, NETL
3rd Floor, Rooms 301, 302

3:30 PM Offshore CO₂ Storage Resource Assessment of the Northern Gulf of Mexico (FE0026083)
- Tip Meckel, University of Texas at Austin (Carr)

3:50 PM Mid-Atlantic U.S. Offshore Carbon Storage Resource Assessment Project (FE0026087)
- Neeraj Gupta, Battelle Memorial Institute (O’Dowd)

4:10 PM Southeast Offshore Storage Resource Assessment (FE0026086)
- James Knapp and Jack Pashin, Oklahoma State University (Sullivan)

4:30 PM Corrosion-Resistant Aluminum Components for Improved Cost and Performance of Ultra-Deepwater Offshore Oil Production (FWP-072971)
- Glenn Grant, Pacific Northwest National Laboratory (Cercone)

5:00 PM Poster Session – Ballroom Foyer

6:30 PM End of Day
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>7:00 AM</td>
<td>Continental Breakfast</td>
<td>Ballroom Foyer</td>
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<td>8:00 AM</td>
<td>International CCS Value Chain Developments Panel</td>
<td>Ballroom A</td>
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<td>Chair and Global Context</td>
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<td>Tim Dixon, General Manager</td>
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<tr>
<td>9:30 AM</td>
<td>Break</td>
<td>Ballroom Foyer</td>
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THURSDAY

CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CAPTURE – PILOT-SCALE RESEARCH
Moderator: David Lang, NETL
10:00 AM
Advanced Solvent Testing and Evaluation at TCM (FWP-70814)
• Charles Freeman, Pacific Northwest National Laboratory; Satish Reddy, Fluor

CAPTURE – ENGINEERING DESIGN
Moderator: David Lang, NETL
10:30 AM
Initial Engineering Design of a Post-Combustion CO₂ Capture System for Duke Energy’s East Bend Station Using Membrane-Based Technology (FE0031589)
• Desmond Dillon, Electric Power Research Institute Inc.
11:00 AM
ION Engineering Commercial Carbon Capture Design and Costing (CIDC) (FE0031595)
• Alfred “Buz” Brown, ION Engineering LLC
11:30 AM
Initial Engineering, Testing and Design of a Commercial-Scale, Post-Combustion CO₂ Capture System on an Existing Coal-Fired Generating Unit (FE0031602)
• Jason Laumb, University of North Dakota Energy and Environmental Research Center
12:00 PM
Lunch

Moderator: Andrew Jones, NETL
1:00 PM
Large Pilot Testing of the MTR Membrane Post-Combustion CO₂ Capture Process (FE0031587)
• Richard Baker, Membrane Technology and Research Inc.
1:20 PM
UKY-CAER Heat-Integrated Transformative CO₂ Capture Process in Pulverized Coal Power Plants (FE0031583)
• Kunlei Liu, University of Kentucky Center for Applied Energy Research
1:40 PM
Large Pilot Testing of Linde-BASF Advanced Post-Combustion Carbon Dioxide Capture Technology at a Coal-Fired Power Plant (FE0031581)
• Kevin O’Brien, University of Illinois at Urbana-Champaign

10:00 AM
Refrining Principal Stress Measurements in Reservoir Underburden in Regions of Induced Seismicity Through Seismological Tools, Laboratory Experiments and Theory (FE0031687)
• Laura Chiaramonte, Electric Power Research Institute (Hull)

Identification of Faults Susceptible to Induced Seismicity (FE0031685)
• Scott Frailey, University of Illinois Urbana-Champaign (Carr)

Methods to Enhance Wellbore Cement Integrity with Microbially-Induced Calcite Precipitation (FE0024296)
• Adrienne Phillips, Montana State University (Vagnetti)

A Non-Invasive Approach for Elucidating the Spatial Distribution of In-Situ Stress in Deep Subsurface Geologic Formations Considered for CO₂ Storage (FE0031686)
• Mark Kelley, Babette Memorial Institute (Aljoe)

Nanoparticle Injection Technology for Remediating Leaks of CO₂ Storage Formation (FE0026514)
• Yunping Xi, University of Colorado (Brown)

Improving Subsurface Stress Characterization for Carbon Dioxide Storage Projects by Incorporating Machine Learning Techniques (FE0031684)
• William Ampomah, New Mexico Institute of Mining & Technology (Underwood)

Wellbore Leakage Mitigation Using Advanced Mineral Precipitation Strategies (FE0026513)
• Adrienne Phillips, Montana State University (Aljoe)

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• Richard Baker, Membrane Technology and Research Inc.

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Lunch – Ballroom A

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• Kevin O’Brien, University of Illinois at Urbana-Champaign

Lunch – Ballroom A
THURSDAY CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

THURSDAY SUBSURFACE BREAKOUT

CAPTURE – NEW RESEARCH PROJECTS LIGHTNING ROUND
Moderator: Andrew Jones, NETL
2:00 PM Validation of Transformational CO₂ Capture Solvent Technology with Revolutionary Stability (FE0031727)
 Erik Meuleman, ION Engineering LLC

2:05 PM Fog-Froth-Based Post-Combustion CO₂ Capture in Fossil-Fuel Power Plants (FE0031733)
 Heather Nilistic, University of Kentucky Center for Applied Energy Research

2:10 PM Transformational Sorbent-Based Process for a Substantial Reduction in the Cost of CO₂ Capture (FE0031723)
 Ravi Jain, IntiSepra LLC

2:15 PM Novel Next-Generation Sorbent System for Post-Combustion CO₂ Capture (FE0031734)
 Gokhan Alsufeyn, TDA Research Inc.

2:20 PM Advanced Structured Adsorbent Architectures for Transformative CO₂ Capture Performance (FE0031732)
 Deborah Jelen, Electricore Inc.

2:25 PM Transformational Molecular Layer Deposition Tailor-Made Size-Sieving Sorbents for Post-Combustion CO₂ Capture (FE0031732)
 Miao Yu, Rensselaer Polytechnic Institute

2:30 PM Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas (FE0031731)
 Yang Han and Winston Ho, The Ohio State University

2:35 PM Rational Development of Novel Metal-Organic Polyhedra-based Membranes for CO₂ Capture (FE0031730)
 Haiqing Lin, University at Buffalo, SUNY

CO₂ UTILIZATION - NEW RESEARCH PROJECTS LIGHTNING ROUND
Moderator: Amishi Kumar, FE HQ
2:40 PM Unique Nanotechnology Converts Carbon Dioxide to Valuable Products (FE0031707)
 Bingyan Li, West Virginia University Research Corporation

2:45 PM Novel Modular ElectroCatalytic Processing for Simultaneous Conversion of Carbon Dioxide and Wet Shale Gas into Valuable Products (FE0031709)
 Jason Tremblay, Ohio University

2:50 PM An Intensified ElectroCatalytic Process for Production of Formic Acid (FE0031720)
 Jesse Thompson, University of Kentucky – CAER

2:55 PM Carbon Dioxide and Renewable Electricity into Chemicals: Chemical Production from Coal Flue Gas (FE0031734)
 Hongzhou Yang, Dioxide Materials Inc.

3:00 PM Break

SUBSURFACE STRESS 2
Moderator: Josh Hull, NETL
3rd Floor, Rooms 303, 304, 305
1:00 PM Robust In-Situ Strain Measurements to Monitor Carbon Dioxide Storage (FE0028292)
 Larry Murdock, Clemson University (Henry)

 Ting Chen, Los Alamos National Laboratory (Hull)

1:40 PM Poroelastic Sustainability of Pressure-Driven Fracture in Carbon Storage Reservoir and its Implication for Injectivity and Caprock Integrity (FEW-0191)
 Pengcheng Fu, Lawrence Livermore National Laboratory (McNemar)

2:00 PM National Risk Assessment Partnership Task 3: Induced Seismicity Risk
 Joshua White, Lawrence Livermore National Laboratory (McNemar)

ASSOCIATED CO₂ STORAGE/EOR
Moderator: Josh Hull, NETL
3rd Floor, Rooms 303, 304, 305
2:20 PM Optimizing CO₂ Sweep Based on Geochemical and Reservoir Characterization of the Residual Oil Zone of Hess Seminole Unit (FE0024275)
 Bo Ren, University of Texas at Austin (Hull)

2:40 PM Stacked Greenfield and Brownfield ROZ Fairways in the Illinois Basin Geo-Laboratory: Co-Optimization of EOR and Associated CO₂ Storage (FE0031700)
 Nathan Webb, University of Illinois at Urbana-Champaign (McNemar)

3:00 PM Break – Ballroom Foyer

WELLBORE INTEGRITY AND MITIGATION 2
Moderator: Kyle Smith, NETL
3rd Floor, Rooms 301, 302
1:00 PM Task 7: Well Integrity Atlas (FEW-0191)
 Susan Carroll, Lawrence Livermore National Laboratory (McNemar)

1:20 PM Autonomous Monitoring of Wellbore Integrity Applying Time Reverse Nonlinear Elastic Wave Spectroscopy (TR NEWS) and Fiber Optic Sensing and Communication (FWP-FE-853-17-FY17)
 Paul Johnson and Carly Donovan, Los Alamos National Laboratory (Underwood)

1:40 PM Porouselastic Sustainability of Pressure-Driven Fracture in Carbon Storage Reservoir and its Implication for Injectivity and Caprock Integrity (FEW-0191)
 Pengcheng Fu, Lawrence Livermore National Laboratory (McNemar)

2:00 PM National Risk Assessment Partnership Task 3: Induced Seismicity Risk
 Joshua White, Lawrence Livermore National Laboratory (McNemar)

ASSOCIATED CO₂ STORAGE/EOR
Moderator: Josh Hull, NETL
3rd Floor, Rooms 303, 304, 305
2:20 PM Optimizing CO₂ Sweep Based on Geochemical and Reservoir Characterization of the Residual Oil Zone of Hess Seminole Unit (FE0024275)
 Bo Ren, University of Texas at Austin (Hull)

2:40 PM Stacked Greenfield and Brownfield ROZ Fairways in the Illinois Basin Geo-Laboratory: Co-Optimization of EOR and Associated CO₂ Storage (FE0031700)
 Nathan Webb, University of Illinois at Urbana-Champaign (McNemar)

3:00 PM Break – Ballroom Foyer

Oil & Gas Projects
THURSDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CO₂ UTILIZATION - NEW RESEARCH PROJECTS "LIGHTNING ROUND"

Moderator: Amishi Kumar, FE HQ

3:30 PM Selective and Efficient Electrochemical Production of Neat Formic Acid from Carbon Dioxide Using Novel Platinum Group Metals-Free Catalysts (FE0031704)
- Syed Mubeen Jawahar Hussaini, The University of Iowa

3:35 PM CO₂ to Fuels Through Novel Electrochemical Catalysis (FE0031716)
- Neal Sullivan, Colorado School of Mines

3:40 PM Design of Transition-Metal/Zeolite Catalysts for Direct Conversion of Coal-Derived Carbon Dioxide to Aromatics (FE0031719)
- Chris Jones, Georgia Tech Research Corporation

3:45 PM Electrochemical Conversion of CO₂ from Coal into Fuels and Chemicals Using a Modified Pem Electrolyzer (FE0031712)
- Kenuta Hult, Opus 17 Inc.

3:50 PM Novel Process for CO₂ Conversion to Fuel (FE0031714)
- Gokhan Alptekin, TDA Research Inc.

3:55 PM Sustainable Conversion of Carbon Dioxide and Shale Gas to Green Acetic Acid Via a Thermochemical Cyclic Redox Scheme (FE0031703)
- Fanling Li, North Carolina State University

4:00 PM Synthetic Calcium Carbonate Production by Carbon Dioxide Mineralization of Industrial Waste Brines (FE0031709)
- Bu Wang, University of Wisconsin

4:05 PM A Scalable Process for Upcycling Carbon Dioxide and Coal Combustion Residues Into Construction Products (FE0031718)
- Gabriel Fabzone, University of California - Los Angeles

4:10 PM Field-Scale Testing of the Thermocatalytic Ethylene Production Process Using Ethane and Actual Coal-Fired Flue Gas CO₂ (FE0031713)
- Amit Goyal, Southern Research Institute

4:15 PM Beneficial Use of CO₂ from Coal-Fired Power Plants for Production of Animal Feeds (FE0031717)
- Tryg Lundquist, MicBio Engineering

4:20 PM Novel Algae Technology to Utilize CO₂ for Value-Added Products (FE0031710)
- Fred Harrington, Helios-NRG LLC
THURSDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CO₂ UTILIZATION
Moderator: Amishi Kumar, FE HQ

4:25 PM  Microwave-Assisted Thermal Conversion of CO₂ and Methane over Conductive Metal Oxides
• Douglas Kauffman, U.S. Department of Energy, National Energy Technology Laboratory

4:45 PM  Electrode-Driven Microbial CO₂ Utilization
• Djuna Gulliver, U.S. Department of Energy, National Energy Technology Laboratory

5:05 PM  Upcycled CO₂-Negative Concrete for Construction Functions (FE0029825)
• Gaurav Sant, University of California - Los Angeles

5:25 PM  Adjourn Capture and Utilization Session

5:50 PM  End of Day
FRIDAY
MORNING SESSION
BALLROOM FOYER

7:00 AM
Continental Breakfast
CAPTURE AND UTILIZATION SESSION

8:00 AM 
**CO₂ Mineralization Using Porous Carbon and Industrial Wastes to Make Multifunctional Concrete (FE0030716)**
- Rouzbeh Shahsavari, C-Crete Technologies LLC

8:20 AM 
**Beneficial Reuse of Carbon Emissions from Coal-Fired Power Plants Using Microalgae (FE0029623)**
- Mark Crocker, University of Kentucky

8:40 AM 
**A New Process for Carbon Dioxide Conversion to Fuel (FE0029866)**
- Gokhan Alptekin, TDA Research Inc.

9:00 AM 
**Nano Engineered Catalyst Supported on Ceramic Hollow Fibers for the Utilization of CO₂ in Dry Reforming to Produce Syngas (FE0029760)**
- Shiguang Li, Gas Technology Institute

9:20 AM 
**Storing CO₂ in Built Infrastructure: CO₂ Carbonation of Precast Concrete Products (FE0030664)**
- Brian Robert Ellis, University of Michigan

9:40 AM 
**Electrochemical Conversion of Carbon Dioxide to Alcohols (FE0029868)**
- Feng Jiao, University of Delaware

10:00 AM 
**CO₂ Utilization Analysis**
- Gregory Hackett, U.S. Department of Energy, National Energy Technology Laboratory

10:20 AM 
Conclude session

10:30 AM 
Break
FRIDAY
CAPTURE AND UTILIZATION SESSION
4TH FLOOR, ROOM 406

CO₂ UTILIZATION
Moderator: Sai Gollakota, NETL

10:45 AM  Low Temperature Process Utilizing Nano-Engineered Catalyst for Olefin Production from Coal Derived Flue Gas (FE0029570)
  • Amit Goyal, Southern Research Institute

11:05 AM  Advanced Manufactured Carbonate Materials for Algal Biomass Production: Joint LLNL SNL Program (FWP-FEW0223)
  • Jennifer Knipe, Lawrence Livermore National Laboratory

11:25 AM  Improving the Economic Viability of Biological Utilization of Coal Power Plant CO₂ by Improved Algae Productivity and Integration with Wastewater (FE0030822)
  • Lance Schideman, University of Illinois at Urbana-Champaign

11:45 AM  Harnessing Algae Biomass to Contain Power Plant Emissions (FE0030977)
  • Wei Liao, Michigan State University

12:05 PM  Novel Catalysts Process Technology for Utilization of CO₂ for Ethylene Oxide and Propylene Oxide (FE0030376)
  • Shaojun James Zhou, Research Triangle Institute

12:25 PM  High-Energy Systems for Transforming CO₂ to Valuable Products (FE0029787)
  • Osman Akpolat, Gas Technology Institute

12:45 PM  End of Meeting
**CARBON CAPTURE**

01 A New Sorbent Process for Transformational Carbon Capture Process (SC0018682)
Gokhan Alptekin, TDA Research Inc.

02 High Capacity, Stable, Low Volatility Water-Lean Solvents for CO2 Capture (SC0018821)
Erik Meuleman, ION Engineering LLC

03 Carbon Dioxide Absorption via Ultra-High Surface Area Carbon (SC0018958)
Yudhishtira Sahoo, Vuronyx Technologies LLC

04 Membranes Based on Polymerized Metal-Organic Frameworks for CO2 Capture (SC0018956)
Ravi Prasad, Helios-NRG LLC

05 Advanced Bio-Derived Sorbents for CO2 Capture (SC0018964)
Anthony Richard, Thermosolv LLC

06 Energy-Efficient Carbon Capture Processes with Adsorbents Displaying Non-Traditional Isotherms (SC0018957)
Thomas McDonald, Mosaic Materials Inc.

07 Novel CO2 Sorbent Materials for Advanced Carbon Capture Technologies (SC0018965)
Juan He, Advanced Energy Materials LLC

08 Integrated Multichannel Water Gas Shift Catalytic Membrane Reactor for Pre-Combustion Carbon Capture (SC0018853)
Zhong Tang, Bettergy Corporation

09 Validation of Transformational CO2 Capture Solvent Technology with Revolutionary Stability (FE0031727)
Erik Meuleman, ION Engineering LLC

10 Fog+Froth-Based Post-combustion CO2 Capture in Fossil-Fuel Power Plants (FE0031733)
Heather Nikolic, University of Kentucky Center for Applied Energy Research

11 Transformational Sorbent-Based Process for a Substantial Reduction in the Cost of CO2 Capture (FE0031722)
Ravi Jain, InnoSepra LLC

12 Novel Next-Generation Sorbent System for Post-Combustion CO2 Capture (FE0031734)
Gokhan Alptekin, TDA Research Inc.

13 Advanced Structured Adsorbent Architectures for Transformative CO2 Capture Performance (FE0031732)
Deborah Jelen, Electricore Inc.

14 Transformational Molecular Layer Deposition Tailor-Made Size-Sieving Sorbents for Post-Combustion CO2 Capture (FE0031730)
Miao Yu, Rensselaer Polytechnic Institute

15 Novel Transformational Membranes and Process for CO2 Capture from Flue Gas (FE0031731)
Yang Han and Winston Ho, The Ohio State University

16 Rational Development of Novel Metal-Organic Polyhedra-Based Membranes for CO2 Capture (FE0031736)
Haiqing Liu, University at Buffalo, SUNY

17 Enriched Amine Sorbent for CO2 Capture in a Temperature Swing Adsorption Pilot Plant
Thiago de Aquino, Associação Beneficente da Indústria Carbonifera de Santa Catarina

18 Memzyme Technology for Cost-Effective CO2 Separations in Enhanced Oil Recovery (TCF-17-13314)
Susan Rempe, Sandia National Laboratories

19 Carbon Capture Retrofit Tools
Timothy Fout, U.S. Department of Energy, National Energy Technology Laboratory

20 Preliminary Evaluation of the Design Implications of Membrane Modules into Large Scale Post-Combustion Carbon Capture
Timothy Fout, U.S. Department of Energy, National Energy Technology Laboratory

21 Update of Greenhouse Gas Reductions in the Power Industry Using Domestic Coal and Biomass with Pulverized Coal Plants
Timothy Fout, U.S. Department of Energy, National Energy Technology Laboratory

22 Membrane-Integrated Sorbent Adsorption Process for Carbon Capture (SC0011885)
Gokhan Alptekin, TDA Research Inc.

23 Solid Phase Supports for Flue Gas CO2 Separation with Molten Electrolytes (SC0017124)
Matthew Merrill, Luna Innovations

24 High-Efficiency Post-Combustion Carbon Capture System (SC0017221)
Codruta Loebick, Precision Combustion Inc.

25 Effect of Alkyl Groups in a Series of Aqueous Amine Solutions Reacted with CO2: A Computational Study
Surya Tiwari, U.S. Department of Energy, National Energy Technology Laboratory

26 Development of Highly Porous Hollow Fiber Support for Post-Combustion Carbon Capture
Shouliang Li, U.S. Department of Energy, National Energy Technology Laboratory

27 Computational Efforts to Push the Limits of Current Physical Solvents for Carbon Pre-combustion Capture
Wei Shi, Battelle Memorial Institute/NETL

28 Screening of Polymers by Integration of Web Scraping, Data Mining, Molecular Modeling and Machine Learning Studies for Carbon-Capture Application
Wei Shi, Battelle Memorial Institute/NETL

29 Poly(1,3-dioxolane)-Based Mixed Matrix Membranes for CO2/N2 Separation
Krysta Clark, U.S. Department of Energy, National Energy Technology Laboratory

30 Effect of Humidity on PIM-1-Based Membrane CO2/N2 Separation Performance and Physical Aging
Zi Tong, U.S. Department of Energy, National Energy Technology Laboratory

31 Structural Design of Cross-Linked Polymer and Ionic Liquids for Ion Gel Gas Separation Membranes
Victor Kusuma, Battelle Memorial Institute

32 Solubility and Diffusivity of Syngas Components into Novel Pre-Combustion CO2 Capture Solvents
Lei Hong, Robert Thompson, Wei Shi and Kevin Resnik, Leidos/National Energy Technology Laboratory; Nicholas Siefert and David Hopkinson, National Energy Technology Laboratory
**CO₂ UTILIZATION**

33 Tailoring Cementitious Materials Toward Value-Added Use of Large CO₂ Volumes (SC0011960)
   Anagi Balachandra, Metna Company

34 Solar Energy-Powered Material-Based Conversion of CO₂ to Fuels (SC0015855)
   Jeffrey Weissman, Precision Combustion Inc.

35 Novel Algae Technology for CO₂ Utilization (SC0017077)
   Fred Harrington, Helios-NRG LLC

36 Electrochemical Reduction of Carbon Dioxide to Useful Chemical Intermediates (SC0017105)
   Philip Cox, Mainstream Engineering Corporation

37 Microfluidic System for CO₂ Reduction to Hydrocarbons (SC0015173)
   Brian Skinn, Faraday Technology Inc.

38 Plasma-Assisted Catalysis for CO₂ and CH₄ (SC0019664)
   Howard Pearlman, Advanced Cooling Technologies Inc.

39 Catalytic Plasmonic Ribbon (SC0019657)
   Yousef Habib, Aquaneers Inc.

40 Unique Nanotechnology Converts Carbon Dioxide to Valuable Products (FE0031707)
   Bingyan Li, West Virginia University Research Corporation

41 Novel Modular Electrochemical Processing for Simultaneous Conversion of Carbon Dioxide and Wet Shale Gas Into Valuable Products (FE0031709)
   Jason Trembly, Ohio University

42 An Intensified Electro-Catalytic Process for Production of Formic Acid (FE0031720)
   Jesse Thompson, University of Kentucky – CAER

43 Carbon Dioxide and Renewable Electricity into Chemicals: Chemical Production from Coal Flue Gas (FE0031706)
   Hongzhou Yang, Dioxide Materials Inc.

44 Selective and Efficient Electrochemical Production of Neat Formic Acid from Carbon Dioxide Using Novel Platinum Group Metals-Free Catalysts (FE0031704)
   Syed Mubeen Jawahar Hussaini, The University of Iowa

45 CO₂ to Fuels Through Novel Electrochemical Catalysis (FE0031716)
   Neal Sullivan, Colorado School of Mines

46 Design of Transition-Metal/Zeolite Catalysts for Direct Conversion of Coal-Derived Carbon Dioxide to Aromatics (FE0031719)
   Chris Jones, Georgia Tech Research Corporation

47 Electrochemical Conversion of CO₂ from Coal Into Fuels and Chemicals Using a Modified Pem Electrolyzer (FE0031712)
   Kendra Kuhl, Opus 12 Inc.

48 Novel Process for CO₂ Conversion to Fuel (FE0031714)
   Gokhan Alptekin, TDA Research Inc.

49 Sustainable Conversion of Carbon Dioxide and Shale Gas to Green Acetic Acid Via a Thermochemical Cyclic Redox Scheme (FE0031703)
   Fanxing Li, North Carolina State University

**CARBON STORAGE**

50 Synthetic Calcium Carbonate Production by Carbon Dioxide Mineralization of Industrial Waste Brines (FE0031705)
   Bu Wang, University of Wisconsin

51 A Scalable Process for Upcycling Carbon Dioxide and Coal Combustion Residues Into Construction Products (FE0031718)
   Gaurav Sant, University of California - Los Angeles

52 Field Scale Testing of the Thermocatalytic Ethylene Production Process Using Ethane and Actual Coal Fired Flue Gas CO₂ (FE0031713)
   Amit Goyal, Southern Research Institute

53 Beneficial Use of CO₂ from Coal-Fired Power Plants for Production of Animal Feeds (FE0031717)
   Tryg Lundquist, MicroBio Engineering

54 Novel Algae Technology to Utilize CO₂ for Value-Added Products (FE0031710)
   Fred Harrington, Helios-NRG LLC

55 Alkanolamines for Acid Gas Removal in Gasification Processes (FWP-72564)
   Philip Koech, Pacific Northwest National Laboratory

56 Incorporating Microencapsulated Sorbents into Bioreactor Chips for CO₂ Capture, Conversion and Air Purification (TCF-18-15781)
   Congwen Ye, Lawrence Livermore National Laboratory

57 A Novel Catalyst for the Synthesis of Electrochemical Fuels (TCF-18-15659)
   Adam Rondinone, Oak Ridge National Laboratory

58 Direct Electrochemical Valorization of Captured Carbon Dioxide (TCF-18-15716)
   Luis Diaz Aldia, Idaho National Laboratory

59 Cost Analysis Associated with Capture, Transport, Utilization and Storage (CTUS) of CO₂
   Tim Grant and Tim Skone, NETL RIC

60 Fundamental Reservoir Properties for High Priority Depositional Environments Targeted for CO₂ Storage
   Dustin Crandall, NETL RIC

61 Impacts of CO₂-Exposed Microbial Ecology on Reservoir Performance
   Djuna Gulliver, NETL RIC

62 Characterizing Shales as Seals for CO₂ Containment and Shales as Reservoirs for Geologic Storage of CO₂
   Dustin Crandall and Angela Goodman, NETL RIC

63 Field Tools for Direct Monitoring of CO₂ and Brine Impacts in Groundwater Systems
   Paul Ohodnicki, NETL RIC

64 Energy Data eXchange (EDX) and National Carbon Sequestration Database and Geographic Information Systems (NatCarb) for DOE R&D tools
   Kelly Rose and Jen Bauer, NETL RIC
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>Risk-Based Data Management System: FracFocus, States First and Produced Water Initiative (FE0027702)</td>
<td>Paul John, Ground Water Protection Council</td>
</tr>
<tr>
<td>66</td>
<td>Resident Inline Robot for Leakage Inspection, Repair and Prevention of Methane Emissions (SC0018906)</td>
<td>Aalap Shah, ULC Robotics</td>
</tr>
<tr>
<td>67</td>
<td>Multifunctional Distributed Fiber Sensors for Pipeline Monitoring and Methane Detections (FE0029063)</td>
<td>Hang &quot;Kevin&quot; Chen, University of Pittsburgh</td>
</tr>
<tr>
<td>68</td>
<td>Modeling Fractured Shale Networks for Horizontal Well Development (SC0018816)</td>
<td>Harry Johnson, Intek Inc.</td>
</tr>
<tr>
<td>69</td>
<td>Microbial Ecology of Hydraulic Shale Environments (FWP-1022415 Task 4)</td>
<td>Djuna Gulliver, NETL-RIC</td>
</tr>
<tr>
<td>70</td>
<td>An Analysis of the Natural Fracture Network Surrounding the MSEEIL Well and Analog Outcrop Data (FWP-1022415 Task 5)</td>
<td>Jerry Boyle, NETL-RIC</td>
</tr>
<tr>
<td>71</td>
<td>Progress in Modifying NFFLOW for Modeling Temperature Transients Throughout a Fractured Natural Gas Reservoir (FWP-1022415 Task 5)</td>
<td>W. Neal Sams, NETL-RIC</td>
</tr>
<tr>
<td>72</td>
<td>Experimental Study of Barite Scaling in Marcellus Shale During a Simulated Injection and Shut-In Period of Hydraulic Fracturing (FWP-1022415 Task 11)</td>
<td>Christina Lopano, NETL-RIC</td>
</tr>
<tr>
<td>73</td>
<td>Digital Core Characterization (FWP-1022415 Task 2)</td>
<td>Dustin Crandall, NETL-RIC</td>
</tr>
<tr>
<td>74</td>
<td>Characterizing Application of CO2 as a Recovery Agent to Mobilize Hydrocarbons from Shale (FWP-1022415 Task 9)</td>
<td>Angela Goodman, NETL-RIC</td>
</tr>
<tr>
<td>75</td>
<td>Quantifying Electron Donating and Accepting Capacity of Shales (FWP-1022415 Task 3)</td>
<td>Brandon McAdams, NETL-RIC</td>
</tr>
<tr>
<td>76</td>
<td>NETL RIC Onshore Unconventional Resources Portfolio (FWP-1022415)</td>
<td>Alexandra Hakala, NETL-RIC</td>
</tr>
<tr>
<td>77</td>
<td>Improved Utilization of Discrete and Heterogeneous Petrophysical Data: An Example From the Tuscaloosa Marine Shale</td>
<td>David Borrok, Missouri University of Science and Technology</td>
</tr>
<tr>
<td>78</td>
<td>Grid-Scale, Long-Term Energy Storage: Repurposing Hydrocarbon Reservoirs, Resources, and Infrastructure to Store CO2, and Heat</td>
<td>Tom Buscheck, LLNL</td>
</tr>
<tr>
<td>79</td>
<td>Developing Biomineralization Technology for Ensuring Wellbore Integrity</td>
<td>Robin Gerlach, University of Montana</td>
</tr>
<tr>
<td>80</td>
<td>Tailoring Cementitious Materials Towards Value-Added Use of Large CO2 Volumes</td>
<td>Anagi Balachandra, Metna Company</td>
</tr>
</tbody>
</table>

Dear Friends:

It is my great pleasure to welcome members and researchers of the United States Department of Energy to Pittsburgh! We are thrilled to host your event, Addressing the Nation's Energy Needs Through Technology Innovation.

Once known for the production of glass, steel and iron, Pittsburgh is now a hub for its advances in technology and robotics, healthcare, medical, education, green buildings, tourism, and of course, energy – and we're not done yet.

In addition, Pittsburgh has a thriving and widely renowned arts and culture scene and a booming culinary experience, and the city is consistently named one of the most livable and best travel destinations in the U.S.

As you explore the city, I am sure you will enjoy our only-in-Pittsburgh attractions that pay homage to the past, celebrate the present and give a sneak peek at the future.

Our Cultural District is home to seven world-class theaters and our 90 neighborhoods, spread over a diverse landscape, embrace a vibrant culture distinctive to this city.

I encourage you to discover the unique charm of Pittsburgh and kindness of our people.

Pittsburgh is a city on the rise, and we are excited to share it with you.

Best wishes for a wonderful conference and enjoy your time in our city.

Sincerely,

Craig T. Davis, CDME
President and CEO

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