

ADDRESSING THE
NATION'S ENERGY NEEDS
THROUGH TECHNOLOGY INNOVATION



20
19

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

August 26–30, 2019



David L. Lawrence Convention Center

1000 Fort Duquesne Blvd

Pittsburgh, PA 15222

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MESSAGE FROM THE DIRECTOR



BRIAN J. ANDERSON

DIRECTOR, NATIONAL ENERGY TECHNOLOGY LABORATORY

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 & 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 & 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!

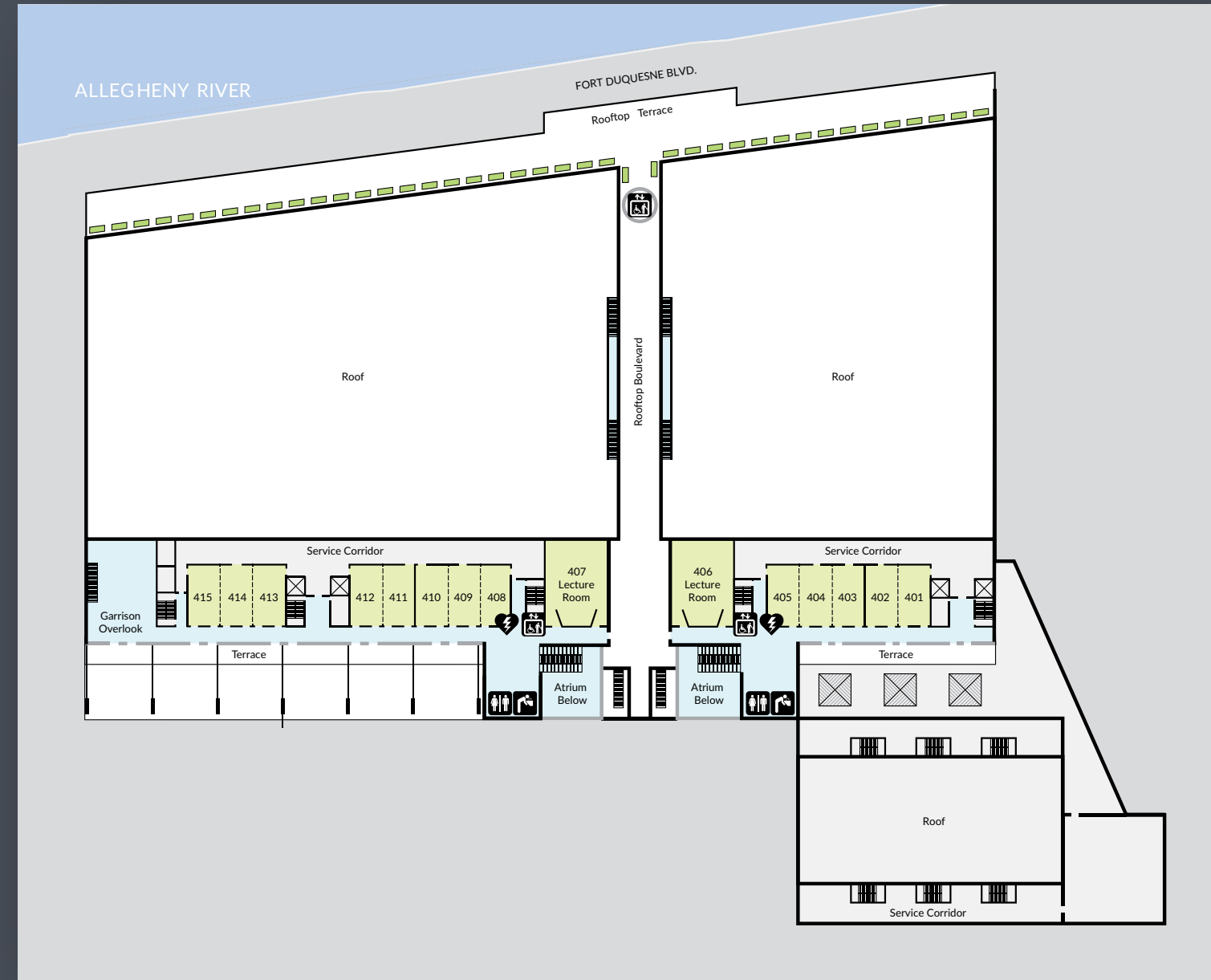
Sincerely,

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

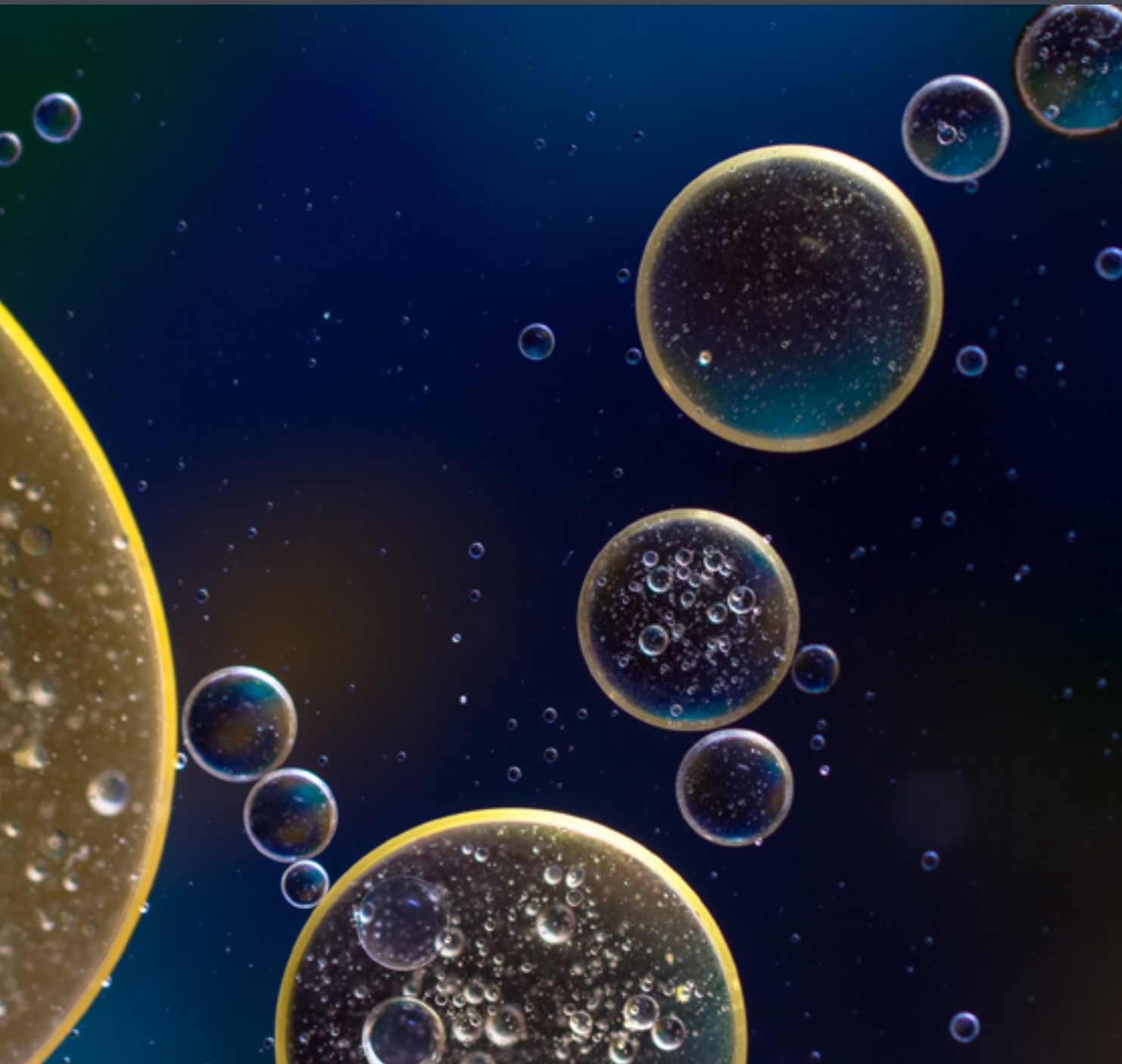
DAVID L. LAWRENCE
CONVENTION CENTER



LEVEL
THREE



LEVEL
FOUR



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)
 - Yongqi 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

MONDAY

SUBSURFACE PLENARY

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 (FE0024233)
 - 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 Duguid, 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

MONDAY

CAPTURE AND UTILIZATION SESSION

4TH FLOOR, ROOM 406

CAPTURE – LAB/BENCH-SCALE RESEARCH

Moderator: Andrew O'Palko, NETL

- 4:00 PM** Bench-Scale Development of a Transformational Graphene Oxide-Based Membrane Process for Post-Combustion CO₂ Capture (FE0031598)
 - Shiguang Li, Gas Technology Institute
- 4:20 PM** Flue Gas Aerosol Pretreatment Technologies to Minimize PCC Solvent Losses (FE0031592)
 - Devin Bostick, Linde LLC
- 4:40 PM** Development of Carbon Molecular Sieves Hollow Fiber Membranes Based on Polybenzimidazole Doped with Polyprotic Acids with Superior H₂/CO₂ Separation Properties (FE0031636)
 - Haiqing Lin, University at Buffalo, SUNY
- 5:00 PM** Emissions Mitigation Technology for Advanced Water-Lean Solvent-based CO₂ Capture Processes (FE0031660)
 - Jak Tanthana, Research Triangle Institute
- 5:20 PM** Syngas Purification Using High-Pressure CO₂BOL Solvents with Pressure Swing Regeneration (FWP-72564)
 - Phillip Koech, Pacific Northwest National Laboratory
- 5:40 PM** Adjourn Capture and Utilization Session
- 6:00 PM** End of Day

MONDAY

SUBSURFACE BREAKOUT

MONITORING 1

Moderator: Jerry Carr, NETL
3rd Floor, Rooms 303, 304, 305

- 4:00 PM** Task 5: Advances in Large-N Seismic Measurements to Monitor Reservoir Behavior (FWP-FEW0191)
 - Eric Matzel, Lawrence Livermore National Laboratory (McNemar)
- 4:20 PM** Task 3: Assessment of Leakage Pathways Using Joint EM-Seismic Borehole and Surface Technologies
- 4:40 PM** Task 2: 2nd Generation SOV DAS (FWP-ESD14095)
 - Julia Correa, Lawrence Berkeley National Laboratory (Carr)
- 5:00 PM** Task 4 Monitoring Technology for Deep CO₂ Injection (FWP-ESD14095)
 - Michael Wilt and Pierpaolo Marchesini, Lawrence Berkeley National Laboratory (Carr)
- 5:20 PM** Development of High Sensitivity Engineered Optical Fiber for Distributed Acoustic Sensing (FWP-FEW0246/FWP-FP00007226)
 - Michael Messerly, Lawrence Livermore National Laboratory (Carr)
- 5:40 PM** Task 2: Monitoring for Small Leaks over Large Areas (FWP-FE-890-18-FY18)
 - Youzuo Lin, Los Alamos National Laboratory (Hull)
- 5:40 PM** National Risk Assessment Partnership Task 6: Risk-Based Approach to Post-Injection Site Closure
 - Bob Dilmore, National Energy Technology Laboratory (Underwood)
- 6:00 PM** End of Day

NATIONAL LAB FUNDAMENTAL SHALE RESEARCH

Moderator: Bruce Brown, NETL
3rd Floor, Rooms 301, 302

- Numerical and Laboratory Investigations for Maximization of Production from Tight/Shale Oil Reservoirs (FWP-FP000008115)
 - George Moridis, Lawrence Berkeley National Laboratory (Henry)
- Fundamentals of Unconventional Reservoirs Research (FWP-FE406-408-409)
 - George Guthrie, Los Alamos National Laboratory (Brown)
- Fundamental Chemical and Mechanical Processes for Unconventional Formations (FWP-1022415)
 - Ale Hakala, National Energy Technology Laboratory
- Chemical Control of Fluid Flow and Contaminant Release in Shale Microfractures (FWP-100211)
 - John Bargar, SLAC National Accelerator Laboratory (Cercone)
- Improved Unconventional Reservoir Stimulation Through Understanding and Enhancing Gravity-Assisted Recovery of Fluids (FWP-FP00008256)
 - Tetsu Tokunaga, Lawrence Berkeley National Laboratory (Henry)
- Controlling Sustainability of Hydraulic Fracture Permeability in Ductile Shales (FWP-FP0008114)
 - Seiji Nakagawa, Lawrence Berkeley National Laboratory (Henry)

Oil & Gas Projects



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 (FWP-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: 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)
 - Haiqing 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-Olalde, 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 (FE0031625)
 - Akhil Dattagupta, 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** NRAP Tool Users Meeting – *Ballroom B*
- 7:30 PM** End of Day

HYDRAULIC FRACTURING TECHNOLOGIES

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

- Passive Acoustic Metamaterial Proppants for Advanced Hydraulic Fracture Diagnostics (SC0017738)
 - Jacob Pollock, Oceanit Laboratories Inc. (Henry)
- 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)
- A New Framework for Microscopic to Reservoir-Scale Simulation of Hydraulic Fracturing and Production: Testing with Comprehensive Data from HFTS and Other Hydraulic Fracturing Field Test Sites (FWP-100480/FWP-FEW0250/FWP-FP00008049)
 - Jens Birkholzer, Lawrence Berkeley National Laboratory; Joe Morris, Lawrence Livermore National Laboratory (Renk)
- Enhancing Unconventional Reservoir Ultimate Recoveries with In-Situ Nano-Catalysts (TCF-18-15390)
 - Randall Winans, Argonne National Laboratory (Cercone)
- Injection and Tracking of Micro Seismic Emitters to Optimize Unconventional Oil and Gas Development (FE0024360)
 - Bjorn Paulsson, Paulsson Inc. (Fincham)
- Development of a Low-Noise Optical Interrogator for Interferometric Sensing Technologies (SC0017729)
 - Bjorn Paulsson, Paulsson Inc. (Fincham)
- Development of a Distributed Optical Sensor Array for Improved Subsurface Characterization and Monitoring (SC0017222)
 - Bjorn Paulsson, Paulsson Inc. (Fincham)



WEDNESDAY

MORNING SESSION

BALLROOM FOYER

7:00 AM

Continental Breakfast

WEDNESDAY

CAPTURE AND UTILIZATION SESSION

4TH FLOOR, ROOM 406

DOCCSS WITH CCSI² SUPPORT

Moderator: Andy Aurelio, NETL

- 8:00 AM** High-Efficiency, Integrated Reactors for Sorbents, Solvents and Membranes using Additive Manufacturing (FWP-FEW0225)
 - Joshua Stolaroff, Lawrence Livermore National Laboratory
- 8:20 AM** Novel Geometry Design for Intensified CO₂ Absorbers
 - Grigorios Panagakos, Carnegie Mellon University
- 8:40 AM** Low-Viscosity, Water-Lean CO₂-Binding Organic Liquids with Polarity-Swing Assisted Regeneration (FWP-70924)
 - David Heldebrant, Pacific Northwest National Laboratory
- 9:00 AM** Low Aqueous Solvent System Optimization
 - Zhijie Xu, Pacific Northwest National Laboratory
- 9:20 AM** Amine-Appended Metal-Organic Frameworks as Switch-Like Adsorbents for Energy-Efficient Carbon Capture (FWP-FP00006194)
 - Jeffrey Long, Lawrence Berkeley National Laboratory
- 9:40 AM** Contactor Design for Transformational Sorbents
 - Debangsu Bhattacharyya, West Virginia University
- 10:00 AM** Break

CAPTURE – LAB/BENCH-SCALE RESEARCH WITH CCSI² SUPPORT

Moderator: Timothy Fout, NETL

- 10:30 AM** Additively Manufactured Intensified Device for Enhanced Carbon Capture (FWP-FEAA130)
 - Xin Sun, Oak Ridge National Laboratory
- 10:50 AM** Computational Design of Intercooled Packing for CO₂ Absorbers
 - Grigorios Panagakos, Carnegie Mellon University

CAPTURE – SYSTEMS STUDIES AND MODELING

Moderator: Timothy Fout, NETL

- 11:10 AM** Cost and Performance Baseline for Fossil Energy Plants, Volume 1: Bituminous Coal and Natural Gas to Electricity, Revision 4
 - Alexander Zoelle, Leidos
- 11:30 AM** Modeling Deployment of CCUS Under 45Q
 - Christopher Nichols, U.S. Department of Energy, National Energy Technology Laboratory

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 Whittaker, Illinois State Geological Survey (Aljoe)
- 12:30 PM** Lunch – *Ballroom A*

 Oil & Gas Projects

WEDNESDAY

CAPTURE AND UTILIZATION SESSION

4TH FLOOR, ROOM 406

CAPTURE – PILOT-SCALE RESEARCH

Moderator: Timothy Fout, NETL

- 11:50 AM** Advanced Carbon Capture Testing at the National Carbon Capture Center (FE0022596)
 - Michele Corser, 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 (FE0007395)
 - 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

WEDNESDAY

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

- 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)

Hexagonal Boron Nitrate Reinforced Multifunctional Well Cement for Extreme Conditions (FE0031574)


- Rouzbeh Shahsavari, C-Crete Technologies Inc. (Fincham)

In-Situ Applied Coatings for Mitigating Gas Hydrate Deposition in Deepwater Operations (FE0031578)

- Carolyn Koh, Colorado School of Mines (Fincham)

The NETL Oil and Gas Offshore Research Portfolio

- Kelly Rose, National Energy Technology Laboratory

 Oil & Gas Projects

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 (FE0031590)
• 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)
- 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

- Offshore CO₂ Storage Resource Assessment of the Northern Gulf of Mexico (FE0026083)
• Tip Meckel, University of Texas at Austin (Carr)
- Mid-Atlantic U.S. Offshore Carbon Storage Resource Assessment Project (FE0026087)
• Neeraj Gupta, Battelle Memorial Institute (O’Dowd)
- Southeast Offshore Storage Resource Assessment (FE0026086)
• James Knapp and Jack Pashin, Oklahoma State University (Sullivan)
- Corrosion-Resistant Aluminum Components for Improved Cost and Performance of Ultra-Deepwater Offshore Oil Production (FWP-072971)
• Glenn Grant, Pacific Northwest National Laboratory (Cercone)



THURSDAY
MORNING SESSION

7:00 AM Continental Breakfast – *Ballroom Foyer*

8:00 AM **International CCS Value Chain Developments Panel – *Ballroom A***
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Chair and Global Context Tim Dixon, General Manager
IEAGHG
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9:30 AM Break – *Ballroom Foyer*

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 (C3DC) (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

THURSDAY

SUBSURFACE BREAKOUT

SUBSURFACE STRESS 1

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

- 10:00 AM** Refining 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)
- 10:20 AM** Identification of Faults Susceptible to Induced Seismicity (FE0031685)
- Scott Frailey, University of Illinois Urbana-Champaign (Carr)
- 10:40 AM** 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, Battelle Memorial Institute (Aljoe)
- 11:00 AM** Improving Subsurface Stress Characterization for Carbon Dioxide Storage Projects by Incorporating Machine Learning Techniques (FE0031684)
- William Ampomah, New Mexico Institute of Mining & Technology (Underwood)
- 11:20 AM** Development of Thermal Breakout Technology for Determining In-Situ Stress (FE0031688)
- Jay Nopola, Re/Spec Inc. (Henry)
- 11:40 AM** Task 5: U.S.-Japan Collaboration on Fiber Optic Technology (FWP-ESD14095)
- Pierre Jean, Lawrence Berkeley National Laboratory (Carr)
- 12:00 PM** Lunch – Ballroom A

WELLBORE INTEGRITY AND MITIGATION 1

Moderator: Rob Vagnetti, NETL
3rd Floor, Rooms 301, 302

- Reactive Flow Through Experiments – A Look at Foamed Cement and CO₂ Resistant Cements
- Barbara Kutchko, National Energy Technology Laboratory
- Methods to Enhance Wellbore Cement Integrity with Microbially-Induced Calcite Precipitation (FE0024296)
- Adrienne Phillips, Montana State University (Vagnetti)
- Nanoparticle Injection Technology for Remediating Leaks of CO₂ Storage Formation (FE0026514)
- Yunping Xi, University of Colorado (Brown)
- Improving Wellbore Integrity and Diagnostics-Scanite for Well Integrity (SC0018836)
- Jacob Pollock, Oceanit Laboratories Inc. (Fincham)
- Wellbore Leakage Mitigation Using Advanced Mineral Precipitation Strategies (FE0026513)
- Adrienne Phillips, Montana State University (Aljoe)
- Programmable Sealant-Loaded Mesoporous Nanoparticles for Gas/Liquid Leakage Mitigation (FE0026511)
- Rouzbeh Shahsavari, C-Crete Technologies Inc. (Hull)

Oil & Gas Projects

THURSDAY

CAPTURE AND UTILIZATION SESSION

4TH FLOOR, ROOM 406

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 Nikolic, 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 (FE0031722)
 - Ravi Jain, InnoSeptra LLC
- 2:15 PM** Novel Next-Generation Sorbent System for Post-Combustion CO₂ Capture (FE0031734)
 - Gokhan Alptekin, 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 (FE0031730)
 - 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 (FE0031736)
 - 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)
 - Bingyun 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 Trembly, Ohio University
- 2:50 PM** An Intensified Electro-Catalytic 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 (FE0031706)
 - Hongzhou Yang, Dioxide Materials Inc.
- 3:00 PM** Break

THURSDAY

SUBSURFACE BREAKOUT

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 Murdoch, Clemson University (Henry)
- 1:20 PM** Task 4: Monitoring for Faults at a Critical State of Stress (FWP-FE-890-18-Y18)
 - 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 (Underwood)

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 (FE0024375)
 - 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

- Task 7: Well Integrity Atlas (FEW-0191)**
 - Susan Carroll, Lawrence Livermore National Laboratory (McNemar)
- 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 Donahue, Los Alamos National Laboratory (Underwood)
- Embedded Sensor Technology Suite for Wellbore Integrity Monitoring (FWP-1022435)**
 - Paul Ohodnicki, National Energy Technology Laboratory (Carr)
- Predicting the Integrity of Seals and Wellbores During Injection and Post Injection (FWP-FE-890-18-FY18)**
 - Bill Carey, Los Alamos National Laboratory (Hull)

- High-Resolution 3D Acoustic Borehole Integrity Monitoring System (FWP-FE-855-17-FY17)**
 - Cristian Pantea, Los Alamos National Laboratory (Underwood)

- Well Integrity for Unconventional Reservoirs (FWP-1022415)**
 - Barbara Kutchko, National Energy Technology Laboratory

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/Zelite 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)
 - Kendra Kuhl, Opus 12 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)
 - Fanxing Li, North Carolina State University
- 4:00 PM** Synthetic Calcium Carbonate Production by Carbon Dioxide Mineralization of Industrial Waste Brines (FE0031705)
 - Bu Wang, University of Wisconsin
- 4:05 PM** A Scalable Process for Upcycling Carbon Dioxide and Coal Combustion Residues Into Construction Products (FE0031718)
 - Gabriel Falzone, 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, MicroBio Engineering
- 4:20 PM** Novel Algae Technology to Utilize CO₂ for Value-Added Products (FE0031710)
 - Fred Harrington, Helios-NRG LLC

THURSDAY

SUBSURFACE BREAKOUT

ASSOCIATED CO₂ STORAGE/EOR

Moderator: Bill Aljoe, NETL
3rd Floor, Rooms 303, 304, 305

- 3:30 PM** Developing CO₂-EOR and Associated Storage within the Residual Oil Zone Fairways of the Powder River Basin, Wyoming
 - Steven Carpenter, University of Wyoming Enhanced Oil Recovery Institute (Hull)
- 3:50 PM** Williston Basin Associated CO₂ Storage Field Laboratory (FE0031694)
 - Robert Klenner, University of North Dakota Energy and Environmental Research Center (O'Dowd)
- 4:10 PM** Task 3: Storage and Trapping of CO₂ in Multiphase Systems (FWP-FE-890-18-FY18)
 - Rajesh Pawar, Los Alamos National Laboratory (Hull)
- 4:30 PM** Task 2: PFT Analysis using Capillary Absorption Tubes-Hydrocarbon-Rich Matrix (FWP-FEAA045)
 - David Graham, Oak Ridge National Laboratory (Carr)
- 4:50 PM** Development of a Framework for Data Integration, Assimilation and Learning for Geological Carbon Sequestration (FE0026515)
 - Alexander Sun, University of Texas at Austin (Brown)
- 5:10 PM** Intelligent Monitoring Systems and Advanced Well Integrity and Mitigation (FE0026517)
 - Scott McDonald, Archer Daniels Midland Corporation (Aljoe)
- 5:30 PM** End of Day

NATURAL GAS INFRASTRUCTURE TECHNOLOGIES

Moderator: Joe Renk, NETL
3rd Floor, Rooms 301, 302

- Remote Methane Sensor for Emissions from Pipelines and Compressor Stations Using Chirped-Laser Dispersion Spectroscopy (FE0029059)
 - Mark Zondlo, Princeton University (Vagnetti)
- Novel Seal Design for Effective Mitigation of Methane Emissions from Reciprocating Compressors (FE0029021)
 - Tim Allison, Southwest Research Institute (Renk)
- Emission Inventories from Natural Gas Storage Facilities Using Regional Frequency Comb Laser Monitoring and Aircraft Flyovers (FE0029168)
 - Greg Rieker, University of Colorado (Smistad)
- Smart Methane Emission Detection System Development (FE0029020)
 - Maria Araujo, Southwest Research Institute (Renk)

INTELLIGENT MONITORING SYSTEMS

Moderator: Bill Aljoe, NETL
3rd Floor, Rooms 303, 304, 305

- In-Situ Pipeline Coatings for Methane Emissions Mitigation and Quantification from Natural Gas Infrastructure (FE0029069)
 - Matthew Nakatsuka, Oceanit Laboratories Inc. (Fincham)
- Sensor-Enabled Coatings for Methane Release Mitigation (FE0029062)
 - Cynthia Kutcho, PPG Industries Inc. (Fincham)

Oil & Gas Projects

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

FRIDAY

CAPTURE AND UTILIZATION SESSION

4TH FLOOR, ROOM 406

CO₂ UTILIZATION

Moderator: Andy Aurelio, NETL

- 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 (FE0030684)
• Brian Robert Ellis, University of Michigan
- 9:40 AM** Electrochemical Conversion of Carbon Dioxide to Alcohols (FE0029868)
• Feng Jiao, University of Delaware

CO₂ UTILIZATION - SYSTEMS STUDIES AND MODELING

Moderator: Andy Aurelio, NETL

- 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 (FE0030678)
• 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



POSTERS INVITED

BALLROOM FOYER

CARBON CAPTURE

A New Sorbent Process for Transformational Carbon Capture Process (SC0018682)

Gokhan Alptekin, TDA Research Inc.

High Capacity, Stable, Low Volatility Water-Lean Solvents for CO₂ Capture (SC0018821)

Erik Meuleman, ION Engineering LLC

Carbon Dioxide Absorption via Ultra-High Surface Area Carbon (SC0018958)

Yudhisthira Sahoo, Vuronyx Technologies LLC

Membranes Based on Polymerized Metal-Organic Frameworks for CO₂ Capture (SC0018956)

Ravi Prasad, Helios-NRG LLC

Advanced Bio-Derived Sorbents for CO₂ Capture (SC0018964)

Anthony Richard, Thermosolv LLC

Energy-Efficient Carbon Capture Processes with Adsorbents Displaying Non-Traditional Isotherms (SC0018957)

Thomas McDonald, Mosaic Materials Inc.

Novel CO₂ Sorbent Materials for Advanced Carbon Capture Technologies (SC0018965)

Juan He, Advanced Energy Materials LLC

Integrated Multichannel Water Gas Shift Catalytic Membrane Reactor for Pre-Combustion Carbon Capture (SC0018853)

Zhong Tang, Bettergy Corporation

Validation of Transformational CO₂ Capture Solvent Technology with Revolutionary Stability (FE0031727)

Erik Meuleman, ION Engineering LLC

Fog+Froth-Based Post-combustion CO₂ Capture in Fossil-Fuel Power Plants (FE0031733)

Heather Nikolic, University of Kentucky Center for Applied Energy Research

Transformational Sorbent-Based Process for a Substantial Reduction in the Cost of CO₂ Capture (FE0031722)

Ravi Jain, InnoSeptra LLC

Novel Next-Generation Sorbent System for Post-Combustion CO₂ Capture (FE0031734)

Gokhan Alptekin, TDA Research Inc.

Advanced Structured Adsorbent Architectures for Transformative CO₂ Capture Performance (FE0031732)

Deborah Jelen, Electricore Inc.

Transformational Molecular Layer Deposition Tailor-Made Size-Sieving Sorbents for Post-Combustion CO₂ Capture (FE0031730)

Miao Yu, Rensselaer Polytechnic Institute

Novel Transformational Membranes and Process for CO₂ Capture from Flue Gas (FE0031731)

Yang Han and Winston Ho, The Ohio State University

Rational Development of Novel Metal-Organic Polyhedra-Based Membranes for CO₂ Capture (FE0031736)

Haiqing Lin, University at Buffalo, SUNY

Enriched Amine Sorbent for CO₂ Capture in a Temperature Swing Adsorption Pilot Plant

Thiago de Aquino, Associação Beneficente da Indústria Carbonífera de Santa Catarina

Memzyme Technology for Cost-Effective CO₂ Separations in Enhanced Oil Recovery (TCF-17-13314)

Susan Rempe, Sandia National Laboratories

Carbon Capture Retrofit Tools

Timothy Fout, U.S. Department of Energy, National Energy Technology Laboratory

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

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

Membrane-Integrated Sorbent Adsorption Process for Carbon Capture (SC0011885)

Gokhan Alptekin, TDA Research Inc.

Solid Phase Supports for Flue Gas CO₂ Separation with Molten Electrolytes (SC0017124)

Matthew Merrill, Luna Innovations

High-Efficiency Post-Combustion Carbon Capture System (SC0017221)

Codruta Loebick, Precision Combustion Inc.

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

Development of Highly Porous Hollow Fiber Support for Post-Combustion Carbon Capture

Shouliang Yi, U.S. Department of Energy, National Energy Technology Laboratory

Computational Efforts to Push the Limits of Current Physical Solvents for Carbon Pre-combustion Capture

Wei Shi, Battelle Memorial Institute/NETL

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

Poly(1,3-dioxlane)-Based Mixed Matrix Membranes for CO₂/N₂ Separation

Krysta Clark, U.S. Department of Energy, National Energy Technology Laboratory

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

Structural Design of Cross-Linked Polymer and Ionic Liquids for Ion Gel Gas Separation Membranes

Victor Kusuma, Battelle Memorial Institute

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

NRAP Tool Users Meeting Posters

Burt Thomas, NETL; Chris Brown, PNNL; Bailian Chen, LANL; Erika Gasperikova, LBNL; Dennise Templeton, LLNL

CO₂ UTILIZATION

Tailoring Cementitious Materials Toward Value-Added Use of Large CO₂ Volumes (SC0011960)

Anagi Balachandra, Metna Company

Solar Energy-Powered Material-Based Conversion of CO₂ to Fuels (SC0015855)

Jeffrey Weissman, Precision Combustion Inc.

Novel Algae Technology for CO₂ Utilization (SC0017077)

Fred Harrington, Helios-NRG LLC

Electrochemical Reduction of Carbon Dioxide to Useful Chemical Intermediates (SC0017105)

Philip Cox, Mainsream Engineering Corporation

Microfluidic System for CO₂ Reduction to Hydrocarbons (SC0015173)

Brian Skinn, Faraday Technology Inc.

Plasma-Assisted Catalysis for CO₂ and CH₄ (SC0019664)

Howard Pearlman, Advanced Cooling Technologies Inc.

Catalytic Plasmonic Ribbon (SC0019657)

Youssef Habib, Aquaneers Inc.

Unique Nanotechnology Converts Carbon Dioxide to Valuable Products (FE0031707)

Bingyun Li, West Virginia University Research Corporation

Novel Modular Electrocatalytic Processing for Simultaneous Conversion of Carbon Dioxide and Wet Shale Gas Into Valuable Products (FE0031709)

Jason Trembly, Ohio University

An Intensified Electro-Catalytic Process for Production of Formic Acid (FE0031720)

Jesse Thompson, University of Kentucky – CAER

Carbon Dioxide and Renewable Electricity into Chemicals: Chemical Production from Coal Flue Gas (FE0031706)

Hongzhou Yang, Dioxide Materials Inc.

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

CO₂ to Fuels Through Novel Electrochemical Catalysis (FE0031716)

Neal Sullivan, Colorado School of Mines

Design of Transition-Metal/Zelite Catalysts for Direct Conversion of Coal-Derived Carbon Dioxide to Aromatics (FE0031719)

Chris Jones, Georgia Tech Research Corporation

Electrochemical Conversion of CO₂ from Coal into Fuels and Chemicals Using a Modified Pem Electrolyzer (FE0031712)

Kendra Kuhl, Opus 12 Inc.

Novel Process for CO₂ Conversion to Fuel (FE0031714)

Gokhan Alptekin, TDA Research Inc.

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

Synthetic Calcium Carbonate Production by Carbon Dioxide Mineralization of Industrial Waste Brines (FE0031705)

Bu Wang, University of Wisconsin

A Scalable Process for Upcycling Carbon Dioxide and Coal Combustion Residues Into Construction Products (FE0031718)

Gaurav Sant, University of California - Los Angeles

Field Scale Testing of the Thermocatalytic Ethylene Production Process Using Ethane and Actual Coal Fired Flue Gas CO₂ (FE0031713)

Amit Goyal, Southern Research Institute

Beneficial Use of CO₂ from Coal-Fired Power Plants for Production of Animal Feeds (FE0031717)

Tryg Lundquist, MicroBio Engineering

Novel Algae Technology to Utilize CO₂ for Value-Added Products (FE0031710)

Fred Harrington, Helios-NRG LLC

Incorporating Microencapsulated Sorbents into Bioreactor Chips for CO₂ Capture, Conversion and Air Purification (TCF-18-15781)

Congwang Ye, Lawrence Livermore National Laboratory

A Novel Catalyst for the Synthesis of Electrochemical Fuels (TCF-18-15659)

Adam Rondinone, Oak Ridge National Laboratory

Direct Electrochemical Valorization of Captured Carbon Dioxide (TCF-18-15716)

Luis Diaz Aldana, Idaho National Laboratory

CARBON STORAGE

Cost Analysis Associated with Capture, Transport, Utilization and Storage (CTUS) of CO₂

Tim Grant and Tim Skone, NETL RIC

Fundamental Reservoir Properties for High Priority Depositional Environments Targeted for CO₂ Storage

Dustin Crandall, NETL RIC

Impacts of CO₂-Exposed Microbial Ecology on Reservoir Performance

Djuna Gulliver, NETL RIC

Characterizing Shales as Seals for CO₂ Containment and Shales as Reservoirs for Geologic Storage of CO₂

Dustin Crandall and Angela Goodman, NETL RIC

Field Tools for Direct Monitoring of CO₂ and Brine Impacts in Groundwater Systems

Paul Ohodnicki, NETL RIC

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

Characterizing Shales as Seals for CO₂ Containment and Shales as Reservoirs for Geologic Storage of CO₂

Dustin Crandall and Sean Sanguinito, NETL RIC

Characterizing Application of CO₂ as a Recovery Agent to Mobilize Hydrocarbons from Shale (FWP-1022415 Task 9)

Foad Haeri, NETL-RIC

OIL & NATURAL GAS

Risk-Based Data Management System: FracFocus, States First and Produced Water Initiative (FE0027702)
Paul Jehn, Ground Water Protection Council

Resident Inline Robot for Leakage Inspection, Repair and Prevention of Methane Emissions (SC0018906)
Aalap Shah, ULC Robotics

Multifunctional Distributed Fiber Sensors for Pipeline Monitoring and Methane Detections (FE0029063)
Hang "Kevin" Chen, University of Pittsburgh

Modeling Fractured Shale Networks for Horizontal Well Development (SC0018816)
Harry Johnson, Intek Inc.

Microbial Ecology of Hydraulic Shale Environments (FWP-1022415 Task 4)
Djuna Gulliver, NETL-RIC

An Analysis of the Natural Fracture Network Surrounding the MSEEL Well and Analog Outcrop Data (FWP-1022415 Task 5)
Jerry Boyle, NETL-RIC

Progress in Modifying NFFLOW for Modeling Temperature Transients Throughout a Fractured Natural Gas Reservoir (FWP-1022415 Task 5)
W. Neal Sams, NETL-RIC

Experimental Study of Barite Scaling in Marcellus Shale During a Simulated Injection and Shut-In Period of Hydraulic Fracturing (FWP-1022415 Task 11)
Christina Lopano, NETL-RIC

Digital Core Characterization (FWP-1022415 Task 2)
Dustin Crandall, NETL-RIC

Characterizing Application of CO₂ as a Recovery Agent to Mobilize Hydrocarbons from Shale (FWP-1022415 Task 9)
Angela Goodman, NETL-RIC

Quantifying Electron Donating and Accepting Capacity of Shales (FWP-1022415 Task 3)
Brandon McAdams, NETL-RIC

NETL RIC Onshore Unconventional Resources Portfolio (FWP-1022415)
Alexandra Hakala, NETL-RIC

Improved Utilization of Discrete and Heterogeneous Petrophysical Data: An Example From the Tuscaloosa Marine Shale
David Borrok, Missouri University of Science and Technology

Grid-Scale, Long-Term Energy Storage: Repurposing Hydrocarbon Reservoirs, Resources, and Infrastructure to Store CO₂ and Heat
Tom Buscheck, LLNL

Developing Biomineralization Technology for Ensuring Wellbore Integrity
Robin Gerlach, University of Montana

Tailoring Cementitious Materials Towards Value-Added Use of Large CO₂ Volumes
Anagi Balachandra, Metna Company

VisitPITTSBURGH

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.

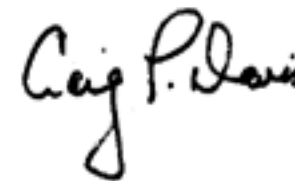
Our Cultural District is home to seven world-class theaters and our 90 neighborhoods, spread over a diverse landscape, embrace a vibrant culture distinctive to this city.

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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