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

NATIONAL ENERGY TECHNOLOGY LABORATORY

David L. Lawrence Convention Center
1000 Fort Duquesne Blvd
Pittsburgh, PA 15222

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.

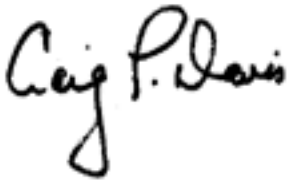
Our Cultural District is home to seven world-class theaters, and our 90 neighborhoods, spread over a diverse landscape, embrace a vibrant culture distinctive to this city.

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,



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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.

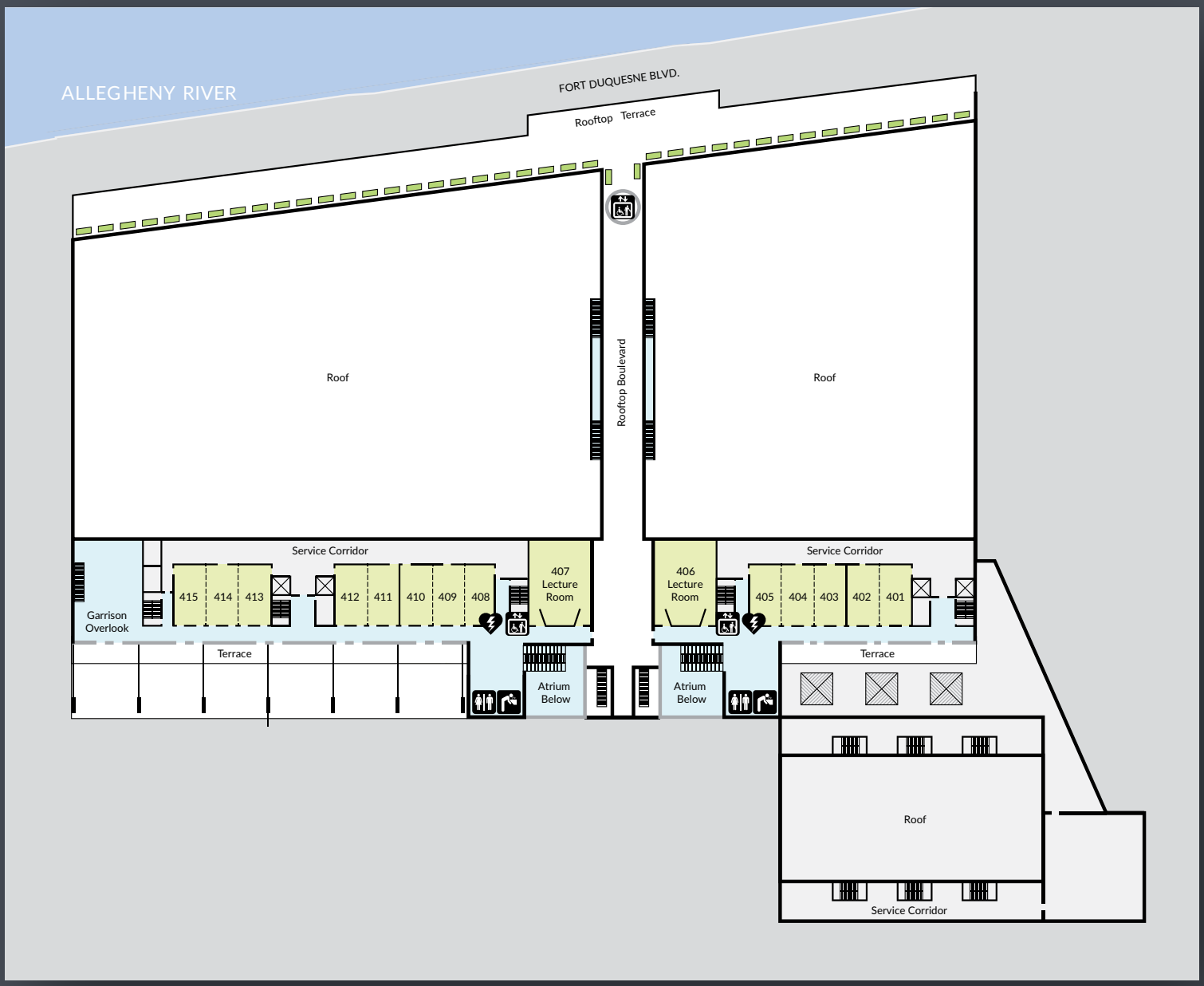
Once again, welcome to Pittsburgh and enjoy your visit!

Sincerely,

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

DAVID L. LAWRENCE CONVENTION CENTER

LEVEL THREE


ALLEGHENY RIVER
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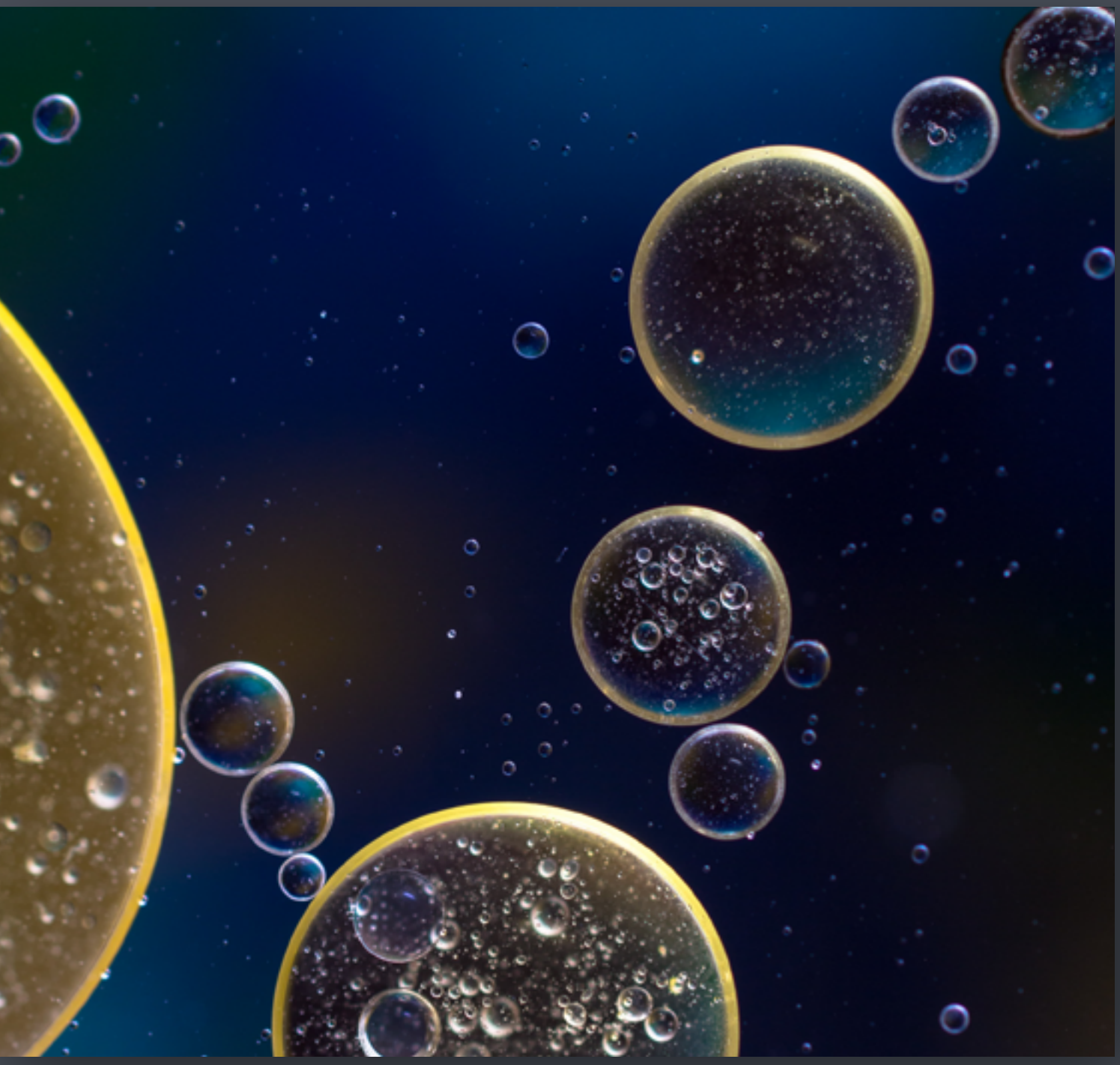
LEVEL FOUR



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** • Anthony Armpriester, Director of Business Development, NRG Energy • Steve Whittaker, Illinois State Geological Survey • Corwyn Bruce, International CCS Knowledge Centre
10:15 AM	Break – *Ballroom Foyer*

MONDAY

CAPTURE AND UTILIZATION SESSION

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)
- Shiguang 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 CO_2 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 CO_2 Capture Via 3D Printing: Modular Adaptive Packing (FE0031530)
- Erik Meuleman, ION Engineering LLC

12:30 PM Lunch – *Ballroom A*

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 Lu, 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 CO_2 Capture (FE0031597)
- Palitha Jayaweera, SRI International

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

3:30 PM Break – *Ballroom Foyer*

MONDAY

SUBSURFACE PLENARY

BALLROOM B

PLAINS AND NORTHWEST 1

Moderator: Bill Aljoe, NETL

10:30 AM Plains CO_2 Reduction Partnership and Phase III (FC26-05NT42592)
- Charles D. Gorecki, University of North Dakota Energy and Environmental Research Center

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

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

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; Reid Edwards, Hilcarp Alaska LLC

12:30 PM Lunch – *Ballroom A*

PLAINS AND NORTHWEST 2

Moderator: Bill O'Dowd, NETL

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

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

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

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

3:30 PM Break – *Ballroom Foyer*

Oil & Gas Projects

MONDAY

CAPTURE AND UTILIZATION SESSION

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 CO_2 Capture (FE0031598)
- Shiguang Li, Gas Technology Institute

4:20 PM Flue Gas Aerosol Pretreatment Technologies to Minimize PCC Solvent Losses (FE0031592)
- Devin Bostick, Linde Gas North America LLC

4:40 PM Development of Carbon Molecular Sieves Hollow Fiber Membranes Based on Polybenzimidazole Doped with Polyprotic Acids with Superior H_2/CO_2 Separation Properties (FE0031636)
- Haiqing Lin, University at Buffalo, SUNY

5:00 PM Emissions Mitigation Technology for Advanced Water-Lean Solvent-Based CO_2 Capture Processes (FE0031660)
- Jak Tanthana, Research Triangle Institute

5:20 PM Syngas Purification Using High-Pressure CO_2BOL Solvents with Pressure Swing Regeneration (FWP-72564)
- Phillip Koech, Pacific Northwest National Laboratory (PNNL)

5:40 PM Adjourn Capture and Utilization Session

6:00 PM End of Day

MONDAY

SUBSURFACE BREAKOUT

	MONITORING 1 **Moderator: Jerry Carr, NETL** **Rooms 303, 304, 305**	NATIONAL LAB FUNDAMENTAL SHALE RESEARCH **Moderator: Bruce Brown, NETL** **Rooms 301, 302**
4:00 PM	Task 5: Advances in Large-N Seismic Measurements to Monitor Reservoir Behavior (FWP-FEW0191) • Eric Matzel, Lawrence Livermore National Laboratory (LLNL)	Numerical and Laboratory Investigations for Maximization of Production From Tight/Shale Oil Reservoirs (FWP-FP000008115) • George Moridis, Lawrence Berkeley National Laboratory (LBNL)
4:20 PM	Task 3: Assessment of Leakage Pathways Using Joint EM-Seismic Borehole and Surface Technologies Task 4 Monitoring Technology for Deep CO_2 Injection (FWP-ESD14095) • Michael Wilt and Pierpaolo Marchesini, LBNL	Mechanistic Approach to Analyzing and Improving Unconventional Hydrocarbon Production (FWP-FE406-408-409) • Hari S. Viswanathan, Los Alamos National Laboratory (LANL)
4:40 PM	Task 2: 2nd Generation SOV DAS (FWP-ESD14095) • Julia Correa, LBNL	Fundamental Chemical and Mechanical Processes for Unconventional Formations (FWP-1022415) • Ale Hakala, NETL
5:00 PM	Development of High Sensitivity Engineered Optical Fiber for Distributed Acoustic Sensing (FWP-FEW0246/FWP-FP00007226) • Michael Messerly, LLNL	Basin-Specific Geochemistry to Improve Unconventional Efficiency (FWP-100211) • John Bargar, SLAC National Accelerator Laboratory
5:20 PM	Task 2: Monitoring for Small Leaks Over Large Areas (FWP-FE-890-18-FY18) • Youzuo Lin, LANL	Improved Understanding of Hydraulic Fracturing Fluid Distribution in Unconventional Reservoir Stimulation (FWP-FP000008256) • Tetsu Tokunaga and Omotayo Omosebi, LBNL
5:40 PM	National Risk Assessment Partnership Task 6: Risk-Based Approach to Post-Injection Site Closure • Bob Dilmore, NETL	Understanding and Controlling Sustainability of Hydraulic Fracture Permeability in Ductile Shales (FWP-FP0008114) • Seiji Nakagawa, LBNL
6:00 PM	End of Day	

Oil & Gas Projects

TUESDAY

MORNING SESSION

7:00 AM Continental Breakfast – *Ballroom Foyer*

8:00 AM Introduction/Welcome – *Ballroom A*

8:05 AM **Regulation Discussion – 45Q**

- Sarah Forbes, Office of Strategic Planning and Global Engagement

8:25 AM **CCUS Federal Financing Mechanisms**

- Chris McLean, Assistant Administrator – Electric at the Rural Utilities Service, USDA
- Khalid Abedin, U.S. Department of Energy Loan Guarantee Program

9:05 AM **Stakeholder Perspectives – The Future of CCUS**

- Shannon Angielski, Executive Director, Carbon Utilization Research Council
- Mark Coalmer, CCUS Projects Director, Oil and Gas Climate Initiative, Climate Investiments LLP
- Kurt Waltzer, Managing Director, Clean Air Task Force
- Hilary Moffett, Occidental Petroleum Corporation

10:30 AM Break – *Ballroom Foyer*

TUESDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CAPTURE – LAB/BENCH-SCALE RESEARCH

Moderator: David Lang, NETL

10:45 AM Advancing Post-Combustion CO_2 Capture Through Increased Mass Transfer (FE0031661)
- Jesse Thompson, University of Kentucky Center for Applied Energy Research

11:05 AM Molecular Refinement of Transformational Solvents for CO_2 Separations (FWP-72396)
- Charles Freeman, PNNL

11:25 AM Inexpensive and Sustainable Anti-Corrosion Coating for Power Generation Applications (FE0031659)
- John Watkins, Lumishield Technologies Incorporated

11:45 AM Membrane Development for Post-Combustion Carbon Capture
- David Hopkinson, NETL

12:05 PM Physical Solvent Development for Pre-Combustion Carbon Capture
- Nicholas Siefert, NETL

12:25 PM Discovery of New Materials for Carbon Capture by Computational Screening
- Jan Steckel, NETL

12:45 PM Lunch – *Ballroom A*

Moderator: Katharina Daniels, NETL

1:30 PM Novel CO_2-Selective Membranes for CO_2 Capture From Less Than 1% CO_2 Sources (FE0026919)
- Yang Han and Winston Ho, The Ohio State University

1:50 PM Zeolite Membrane Reactor for Pre-Combustion Carbon Dioxide Capture (FE0026435)
- Lie Meng, 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 CO_2 Capture (FE0031632)
- Jay Kniep, Membrane Technology and Research Inc.

2:50 PM Development of Pre-Combustion CO_2 Capture Process Using High-Temperature PBI (FE0031633)
- Indira Jayaweera and Elisabeth Perea, SRI International

3:10 PM A High-Efficiency, Ultra-Compact Process for Pre-Combustion CO_2 Capture (FE0026423/FE0031737)
- Theodore Tsotsis, University of Southern California

3:30 PM Break – *Ballroom Foyer*

TUESDAY

SUBSURFACE PLENARY

BALLROOM B

SOUTHEAST REGION 1

Moderator: Mary Sullivan, NETL

10:45 AM	Tuscaloosa Marine Shale Laboratory (FE0031575) • Mehdi Mokhtari, University of Louisiana at Lafayette
11:15 AM	Marcellus Shale Energy and Environment Laboratory (FE0024297) • Timothy Carr, West Virginia University
11:45 AM	Southeast Regional Carbon Sequestration Partnership (Cranfield) – Phase III (FC26-05NT42590) • Sue Hovorka, University of Texas at Austin
12:15 PM	Southeast Regional Carbon Sequestration Partnership (Citronelle) – Phase III (FC26-05NT42590) • Anne Oudinot, Advanced Resources International
12:45 PM	Lunch – *Ballroom A*

SOUTHEAST REGION 2

Moderator: Mary Sullivan, NETL

1:30 PM	Establishing an Early Carbon Dioxide Storage Complex in Kemper County, Mississippi: Project ECO_2S (FE0029465) • Dave Riestenberg, Advanced Resources International
2:00 PM	Phase II Field Demonstration at Plant Smith Generating Station: Assessment of Opportunities for Optimal Reservoir Pressure Control, Plume Management and Produced Water Strategies (DE-FE0026140) • Robert Trautz, Electric Power Research Institute Inc.
2:30 PM	Offshore Gulf of Mexico Partnership for Carbon Storage – Resources and Technology Development (FE0031558) • Susan Hovorka, Gulf Coast Carbon Center, Bureau of Economic Geology, JSG, University of Texas at Austin
3:00 PM	Southeast Regional Carbon Storage Partnership: Offshore Gulf of Mexico (FE0031557) • Michael Godec, Advanced Resources International
3:30 PM	Break – *Ballroom Foyer*

Oil & Gas Projects

TUESDAY

CAPTURE AND UTILIZATION SESSION

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)
- Oscar Ovalle-Encinia, 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
- Brenda Ng, LLNL

5:00 PM Application of Sequential Design of Experiments (SDoE) to Solvent-Based CO_2 Capture Systems at Multiple Scales
- Joshua Morgan, NETL

5:20 PM Adjourn Capture and Utilization Session

6:00 PM End of Day

TUESDAY

SUBSURFACE BREAKOUT

	MONITORING 2 **Moderator: Kyle Smith, NETL** **Rooms 303, 304, 305**	HYDRAULIC FRACTURING TECHNOLOGIES **Moderator: Steve Henry, NETL** **Rooms 301, 302**
4:00 PM	Charged Wellbore Casing Controlled Source Electromagnetics for Reservoir Imaging and Monitoring (FE0028320) • Yaoguo Li, Colorado School of Mines	Passive Acoustic Metamaterial Proppants for Advanced Hydraulic Fracture Diagnostics (SC0017738) • Jacob Pollock, Oceanit Laboratories Inc.
4:20 PM	New Imaging and CO_2 Storage Technologies for Unconventional Subsurface Reservoirs (FWP-70066) • Quin Miller, PNNL	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
4:40 PM	Integration of Seismic-Pressure-Petrophysics Inversion of Continuous Active-Seismic Monitoring Data for Monitoring and Quantifying CO_2 Plume (FE0031544) • Tieyuan Zhu, Pennsylvania State University	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, LBNL; Joe Morris, LLNL
5:00 PM	Joint Inversion of Time-Lapse Seismic Data (FE0031540) • César Barajas-Olalde, University of North Dakota Energy and Environment Research Center	Enhancing Unconventional Reservoir Ultimate Recoveries with In-Situ Nano-Catalysts (TCF-18-15390) • Randall Winans, Argonne National Laboratory
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	Injection and Tracking of Micro Seismic Emitters to Optimize Unconventional Oil and Gas Development (FE0024360) • Bjorn Paulsson, Paulsson Inc. Development of a Low-Noise Optical Interrogator for Interferometric Sensing Technologies (SC0017729) • Michael T.V. Wylie, Paulsson Inc.
5:40 PM	Geochemical Impacts and Signals of CO_2 in Groundwater • Christina Lopano and Ale Hakala, NETL	Development of a Distributed Optical Sensor Array for Improved Subsurface Characterization and Monitoring (SC0017222) • Michael T.V. Wylie, Paulsson Inc.
6:00 PM	NRAP Tool Users Meeting – *Rooms 303, 304, 305*	
7:30 PM	End of Day	

Oil & Gas Projects

WEDNESDAY

MORNING

7:00 AM	Continental Breakfast – Ballroom Foyer

WEDNESDAY

CAPTURE AND UTILIZATION SESSION

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)
- Joshuah Stolaroff, LLNL

8:20 AM Novel Geometry Design for Intensified CO_2 Absorbers
- Grigorios Panagakos, Carnegie Mellon University

8:40 AM Low-Viscosity, Water-Lean CO_2-Binding Organic Liquids (CO_2BOL) with Polarity Swing-Assisted Regeneration (PSAR) (FWP-70924)
- Richard F. Zheng, PNNL

9:00 AM Low Aqueous Solvent System Optimization
- Zhijie Xu, PNNL

9:20 AM Amine-Appended Metal-Organic Frameworks as Switch-Like Adsorbents for Energy-Efficient Carbon Capture (FWP-FP00006194)
- Jeffrey Long, LBNL

9:40 AM Contactor Design for Transformational Sorbents
- Debangsu Bhattacharyya, West Virginia University

10:00 AM Break – *Ballroom Foyer*

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 (ORNL)

10:50 AM Computational Design of Intercooled Packing for CO_2 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, NETL

11:30 AM Modeling Deployment of CCUS
- Christopher Nichols, NETL

WEDNESDAY

SUBSURFACE PLENARY

BALLROOM B

TEXAS REGION

Moderator: Gary Covatch, NETL

8:00 AM	Hydraulic Fracturing Test Site I, Midland Basin, West Texas (FE0024292) • Jordan Ciezobka, Gas Technology Institute
8:30 AM	Eagle Ford Shale Laboratory South Texas (FE0031579) • A. Dan Hill, Texas A&M University
9:00 AM	Hydraulic Fracturing Test Site II, Delaware Basin, West Texas (FE0031577) • Jordan Ciezobka, Gas Technology Institute
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
10:00 AM	Break – *Ballroom Foyer*

MIDWEST REGION

Moderator: Andrea McNemar, NETL

10:30 AM	Midwest Regional Carbon Sequestration Partnership (FC26-05NT42589) • Neeraj Gupta, Battelle Memorial Institute
11:00 AM	Midwest Geological Sequestration Consortium Update (FC26-05NT42588) • Sallie Greenberg, University of Illinois
11:30 AM	Wabash CarbonSAFE (FE0031626) • Christopher Korose, University of Illinois at Urbana-Champaign
12:00 PM	CarbonSAFE Macon County Illinois (FE0029381) • Steve Whittaker, Illinois State Geological Survey
12:30 PM	Lunch – *Ballroom A*

Oil & Gas Projects

WEDNESDAY

CAPTURE AND UTILIZATION SESSION

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)
- Shiguang Li, Gas Technology Institute

12:30 PM Lunch – *Ballroom A*

Moderator: Naomi O'Neil, NETL

1:30 PM Pilot-Scale Slipstream Testing of Sorbent-Based CO_2 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 CO_2 (FE0031588)
- Indira Jayaweera, SRI International

3:00 PM Break – *Ballroom Foyer*

WEDNESDAY

SUBSURFACE BREAKOUT

	MONITORING 3 **Moderator: Jerry Carr, NETL** **Rooms 303, 304, 305**	OFFSHORE **Moderator: Bill Fincham, NETL** **Rooms 301, 302**
1:30 PM	Active Seismic Monitoring of CO_2 Leakage Through a Hydromechanically Reactivated Fault Caprock Integrity Monitoring for a Geological Carbon Sequestration Site Analog: Validating a CASSM Monitoring System (FWP-FP00007630) • Jens Birkholzer and Yves Guglielmi, LBNL	Offshore High Resolution 3D Seismic Data Over the Active CO_2 Injection Site at Tomakomai, Japan (FE0028193) • Tip Meckel, University of Texas at Austin
1:50 PM	RIC Task 25: Long-Period, Long-Duration (LPLD) Seismic Events Observed at Two CO_2 EOR Locations • Rick Hammack, NETL	Hexagonal Boron Nitrate-Reinforced Multifunctional Well Cement for Extreme Conditions (FE0031574) • Rouzbeh Shahsavari, C-Crete Technologies Inc.
2:10 PM	National Risk Assessment Partnership: Strategic Monitoring for Uncertainty Reduction • Erika Gasperikova, LBNL	In-Situ Applied Coatings for Mitigating Gas Hydrate Deposition in Deepwater (FE0031578) • Carolyn Koh, Colorado School of Mines
2:30 PM	Monitoring of Geological CO_2 Sequestration Using Isotopes and PF Tracers (FWP-FEAA045) • Joachim Moortgat, ORNL	An Ounce of Prevention is Worth a Pound of Response, NETL's Big Data Technologies for Offshore Spill Prevention • Kelly Rose, NETL
3:00 PM	Break – *Ballroom Foyer*	

Oil & Gas Projects

WEDNESDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CAPTURE – PILOT-SCALE RESEARCH

Moderator: Andrew O'Palko, NETL

3:15 PM Scale-Up and Testing of Advanced Polaris Membrane CO_2 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)
- Marty Lail, 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 – *Ballroom Foyer*

6:30 PM End of Day

WEDNESDAY

SUBSURFACE BREAKOUT

	GEOLOGIC STORAGE **Moderator: Mary Underwood, NETL** **Rooms 303, 304, 305**	OFFSHORE **Moderator: Bill O'Dowd, NETL** **Rooms 301, 302**
3:30 PM	National Risk Assessment Partnership Task 2: Containment Assurance • Dylan Harp, LANL	Northern Gulf of Mexico Offshore CO_2 Storage Assessment: Final Results (FE0026083) • Tip Meckel, University of Texas at Austin
3:50 PM	Task 4: Active Reservoir Management (FEW-0191) • Thomas Buscheck, LLNL	Mid-Atlantic U.S. Offshore Carbon Storage Resource Assessment Project (FE0026087) • Neeraj Gupta, Battelle Memorial Institute
4:10 PM	National Risk Assessment Partnership Task 5: Application of Risk Assessment Tools and Methodologies to Synthetic and Field Data • Diana Bacon, PNNL	Southeast Offshore Storage Resource Assessment (FE0026086) • James Knapp and Jack Pashin, Oklahoma State University
4:30 PM	Development of Defensible CO_2 Storage Methods and Tools to Quantify Prospective Storage in the Subsurface • Angela Goodman and Kelly Rose, NETL	Corrosion-Resistant Aluminum Components for Improved Cost and Performance of Ultra-Deepwater Offshore Oil Production (FWP-072971) • Glenn Grant, PNNL
5:00 PM	Poster Session – *Ballroom Foyer*	
6:30 PM	End of Day	

THURSDAY

MORNING SESSION

7:00 AM Continental Breakfast – *Ballroom Foyer*

8:00 AM **International CCS Value Chain Developments Panel – *Ballroom A***

Chair and Global Context
- Tim Dixon, General Manager, IEAGHG

Norway's Full-Scale Integrated Project – Capture Aspects
- Bjørn-Erik Haugan, Gassnova

Norway's Full-Scale Integrated Project – Transport and Storage Aspects
- Philip Ringrose, Equinor

Hydrogen Energy Supply from Australia to Japan
- Katsuya Ishikawa, KHI

Valuing CCS Flexibility on the Electricity Grid
- Geoff Bongers, Gamma Energy Technology, Australia

The Value of CCS – Socio-Economic Impacts
- Piera Patrizio, International Institute for Applied Systems Analysis

9:45 AM Break – *Ballroom Foyer*

THURSDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CAPTURE – PILOT-SCALE RESEARCH

Moderator: David Lang, NETL

10:00 AM Advanced Solvent Testing and Evaluation at TCM (FWP-708140)
- Satish Reddy, Fluor

CAPTURE – ENGINEERING DESIGN

Moderator: David Lang, NETL

10:30 AM Initial Engineering Design of a Post-Combustion CO_2 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)
- Andrew Awtry, ION Engineering LLC

11:30 AM Initial Engineering, Testing and Design of a Commercial-Scale, Post-Combustion CO_2 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 – *Ballroom A*

Moderator: Andrew Jones, NETL

1:00 PM Large Pilot Testing of the MTR Membrane Post-Combustion CO_2 Capture Process (FE0031587)
- Richard Baker, Membrane Technology and Research Inc.

1:20 PM UKY-CAER Heat-Integrated Transformative CO_2 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: Kylee Underwood, NETL** **Rooms 303, 304, 305**	WELLBORE INTEGRITY AND MITIGATION 1 **Moderator: Rob Vagnetti, NETL** **Rooms 301, 302**
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 Reseach Institute	Reactive Flow Through Experiments – A Look at Foamed Cement and CO_2 Resistant Cements • Barbara Kutchko, NETL
10:20 AM	Identification of Faults Susceptible to Induced Seismicity (FE0031685) • Scott Frailey, Illinois State Geological Survey	Methods to Enhance Wellbore Cement Integrity with Microbially Induced Calcite Precipitation (FE0024296) • Adrienne Phillips, Montana State University
10:40 AM	A Non-Invasive Approach for Mapping Stress in Subsurface Geologic Formations Considered for CO_2 Sequestration (FE0031686) • Mark Kelley, Battelle Memorial Institute	Nanoparticle Injection Technology for Remediating Leaks of CO_2 Storage Formation (FE0026514) • Mija Hubler, University of Colorado
11:00 AM	Improving Subsurface Stress Characterization for Carbon Dioxide Storage Projects by Incorporating Machine Learning Techniques (FE0031684) • Robert Will, New Mexico Institute of Mining & Technology	Improving Wellbore Integrity and Diagnostics-Scanite for Well Integrity (SC0018836) • Jacob Pollock, Oceanit Laboratories Inc.
11:20 AM	Development of Thermal Breakout Technology for Determining In-Situ Stress (FE0031688) • Jay Nopola, RESPEC	Wellbore Leakage Mitigation Using Advanced Mineral Precipitation Strategies (FE0026513) • Adrienne Phillips, Montana State University
11:40 AM	Task 5: U.S.-Japan Collaboration on Fiber Optic Technology (FWP-ESD14095) • Pierre Jean, LBNL	Programmable Sealant-Loaded Mesoporous Nanoparticles for Gas/Liquid Leakage Mitigation (FE0026511) • Rouzbeh Shahsavari, C-Crete Technologies Inc.
12:00 PM	Lunch – *Ballroom A*	

Oil & Gas Projects

THURSDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CAPTURE – NEW RESEARCH PROJECTS LIGHTNING ROUND

Moderator: Andrew Jones, NETL

2:00 PM Validation of Transformational CO_2 Capture Solvent Technology with Revolutionary Stability (FE0031727)
- Erik Meuleman, ION Engineering LLC

2:05 PM Fog+Froth-Based Post-Combustion CO_2 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 CO_2 Capture (FE0031722)
- Ravi Jain, InnoSepra LLC

2:15 PM Novel Next-Generation Sorbent System for Post-Combustion CO_2 Capture (FE0031734)
- Gokhan Alptekin, TDA Research Inc.

2:20 PM Advanced Structured Adsorbent Architectures for Transformative CO_2 Capture Performance (FE0031732)
- Deborah Jelen, Electricore Inc.

2:25 PM Transformational Molecular Layer Deposition Tailor-Made Size-Sieving Sorbents for Post-Combustion CO_2 Capture (FE0031730)
- Miao Yu, Rensselaer Polytechnic Institute

2:30 PM Novel Transformational Membranes and Process for CO_2 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 CO_2 Capture (FE0031736)
- Haiqing Lin, University at Buffalo, SUNY

CO_2 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 and Trina Karolchik Wafle, West Virginia University

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 Center for Applied Energy Research

2:55 PM CO_2 and Renewable Electricity into Chemicals: Formic Acid Production from Coal Flue Gas (FE0031706)
- Hongzhou Yang, Dioxide Materials Inc.

3:00 PM Break – *Ballroom Foyer*

THURSDAY

SUBSURFACE BREAKOUT

SUBSURFACE STRESS 2

Moderator: Josh Hull, NETL
Rooms 303, 304, 305

1:00 PM
National Risk Assessment Partnership Task 3: Induced Seismicity Risk
- Joshua White, LLNL

1:20 PM
Task 4: Monitoring for Faults at a Critical State of Stress (FWP-FE-890-18-Y18)
- Ting Chen, LANL

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, LLNL

2:00 PM
Robust In-Situ Strain Measurements to Monitor Carbon Dioxide Storage (FE0028292)
- Larry Murdoch, Clemson University

WELLBORE INTEGRITY AND MITIGATION 2

Moderator: Kyle Smith, NETL
Rooms 301, 302

1:00 PM
Well Integrity Atlas: Review of CO_2 Storage Projects and Research Needs (FEW-0191)
- Susan Carroll, LLNL

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 Donahue, LANL

1:40 PM
Embedded Sensor Technology Suite for Wellbore Integrity Monitoring (FWP-1022435)
- Paul Ohodnicki, NETL

2:00 PM
Experimental Validation of Self-Sealing of Wellbore Cement (FWP-FE-890-18-FY18)
- Bill Carey, LANL

ASSOCIATED CO_2 STORAGE/EOR

Moderator: Josh Hull, NETL
Rooms 303, 304, 305

2:20 PM
Optimizing CO_2 Sweep Based on Geochemical and Reservoir Characterization of the Residual Oil Zone of Hess Seminole Unit (FE0024375)
- Bo Ren, University of Texas at Austin

2:40 PM
Stacked Greenfield and Brownfield ROZ Fairways in the Illinois Basin Geo-Laboratory: Co-Optimization of EOR and Associated CO_2 Storage (FE0031700)
- Nathan Webb, Illinois State Geological Survey; University of Illinois

3:00 PM
Break – *Ballroom Foyer*

Oil & Gas Projects

THURSDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CO_2 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 CO_2 to Fuels Through Novel Electrochemical Catalysis (FE0031716)
- Zehua Pan, 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 Institute of Technology

3:45 PM Electrochemical Conversion of CO_2 from Coal into Fuels and Chemicals Using a Modified Pem Electrolyzer (FE0031712)
- Etosha Cave, Opus 12 Inc.

3:50 PM Novel Process for CO_2 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 - Madison

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 CO_2 (FE0031713)
- Amit Goyal, Southern Research Institute

4:15 PM Beneficial Use of CO_2 from Coal-Fired Power Plants for Production of Animal Feeds (FE0031717)
- Tryg Lundquist, MicroBio Engineering

4:20 PM Novel Algae Technology to Utilize CO_2 for Value-Added Products (FE0031710)
- Fred Harrington, Helios-NRG LLC

THURSDAY

SUBSURFACE BREAKOUT

ASSOCIATED CO_2 STORAGE/EOR

Moderator: Bill Aljoe, NETL
Rooms 303, 304, 305

3:30 PM Developing CO_2-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

3:50 PM Williston Basin-Associated CO_2 Storage Field Laboratory (FE0031694)
- Steven A. Smith, University of North Dakota Energy and Environmental Research Center

4:10 PM Task 3: Storage and Trapping of CO_2 in Multiphase Systems (FWP-FE-890-18-FY18)
- Rajesh Pawar, LANL

4:30 PM Task 2: PFT Analysis Using Capillary Absorption Tubes-Hydrocarbon-Rich Matrix (FWP-FEAA045)
- David Graham, ORNL

INTELLIGENT MONITORING SYSTEMS

Moderator: Bill Aljoe, NETL
Rooms 303, 304, 305

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

5:10 PM Intelligent Monitoring Systems and Advanced Well Integrity and Mitigation (FE0026517)
- Julia Correa, LBNL

5:30 PM End of Day

NATURAL GAS INFRASTRUCTURE TECHNOLOGIES

Moderator: Joe Renk, NETL
Rooms 301, 302

3:30 PM Remote Methane Sensor for Emissions from Pipelines and Compressor Stations Using Chirped-Laser Dispersion Spectroscopy (FE0029059)
- Mark Zondlo, Princeton University

3:50 PM Novel Seal Design for Effective Mitigation of Methane Emissions from Reciprocating Compressors (FE0029021)
- Tim Allison, Southwest Research Institute

4:10 PM Emission Inventories from Natural Gas Storage Facilities Using Regional Frequency Comb Laser Monitoring and Aircraft Flyovers (FE0029168)
- Greg Rieker, University of Colorado

4:30 PM Smart Methane Emission Detection System Development (FE0029020)
- Heath Spidle, Southwest Research Institute

4:50 PM In-Situ Pipeline Coatings for Methane Emissions Mitigation and Quantification from Natural Gas Infrastructure (FE0029069)
- Matthew Nakatsuka, Oceanit Laboratories Inc.

5:10 PM Sensor-Enabled Coatings for Methane Release Mitigation (FE0029062)
- Cynthia Kutchko, PPG Industries Inc.

Oil & Gas Projects

THURSDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CO_2 UTILIZATION

Moderator: Amishi Kumar, FE HQ

4:25 PM Microwave-Assisted Thermal Conversion of CO_2 and Methane Over Conductive Metal Oxides
- Douglas Kauffman, NETL

4:45 PM Electrode-Driven Microbial CO_2 Utilization
- Djuna Gulliver, NETL

5:05 PM Upcycled CO_2-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


POWER ON

FRIDAY

MORNING SESSION

7:00 AM	Continental Breakfast – Ballroom Foyer

FRIDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CO_2 UTILIZATION

Moderator: Andy Aurelio, NETL

8:00 AM CO_2 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 CO_2 in Dry Reforming to Produce Syngas (FE0029760)
- Shiguang Li, Gas Technology Institute

9:20 AM Storing CO_2 in Built Infrastructure: CO_2 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

CO_2 UTILIZATION - SYSTEMS STUDIES AND MODELING

Moderator: Andy Aurelio, NETL

10:00 AM Overview of Carbon Utilization Analysis at NETL
- Gregory Hackett, NETL

10:20 AM Conclude session

10:30 AM Break – *Ballroom Foyer*

FRIDAY

SUBSURFACE WORKSHOP

ROOMS 303, 304, 305

GAS HYDRATES

Moderator: Rick Baker

8:00 AM	Alaska Natural Gas Hydrate Production Testing: Test Site Selection, Characterization, and Testing Operations • Ray Boswell, NETL
8:30 AM	Deepwater Methane Hydrate Characterization and Scientific Assessment in Gulf of Mexico • Peter Flemings, University of Texas at Austin
9:00 AM	Coupled Hydrologic, Thermodynamic, and Geomechanical Processes of Natural Gas Hydrate Production • Mark White, PNNL
9:20 AM	Numerical Studies for the Characterization of Recoverable Resources From Methane Hydrate Deposits • George Moridis, LBNL
9:40 AM	Behavior of Sediments Containing Methane Hydrate, Water, and Gas Subjected to Gradients and Changing Conditions • Timothy J. Kneafsey, LBNL
10:00 AM	Natural Gas Hydrates Research NETL-RIC • Yongkoo Seol, NETL
10:30 AM	Break – *Ballroom Foyer*
12:00 PM	End of Meeting

Oil & Gas Projects

FRIDAY

CAPTURE AND UTILIZATION SESSION

ROOM 406

CO_2 UTILIZATION

Moderator: Sai Gollakota, NETL

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

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

11:25 AM Improving the Economic Viability of Biological Utilization of Coal Power Plant CO_2 by Improved Algae Productivity and Integration with Wastewater Treatment (DE-FE0030822)
- Lance Schideman, University of Illinois at Urbana-Champaign; Illinois Sustainable Technology Center

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

12:05 PM Novel Catalytic Process Technology for Utilization of CO_2 for Acrylonitrile Production (FE0030678)
- Marty Lail, Research Triangle Institute

12:25 PM High-Energy Systems for Transforming CO_2 to Valuable Products (FE0029787)
- Osman Akpolat, Gas Technology Institute

12:45 PM End of Meeting

WEDNESDAY

POSTERS PRESENTATIONS

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 CO_2 Capture (SC0018821)
- Erik Meuleman, ION Engineering LLC

Membranes Based on Polymerized Metal-Organic Frameworks for CO_2 Capture (SC0018956)
- Ravi Prasad, Helios-NRG LLC

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

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

Validation of Transformational CO_2 Capture Solvent Technology with Revolutionary Stability (FE0031727)
- Erik Meuleman, ION Engineering LLC

Fog+Froth-Based Post-Combustion CO_2 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 CO_2 Capture (FE0031722)
- Ravi Jain, InnoSepra LLC

Novel Next-Generation Sorbent System for Post-Combustion CO_2 Capture (FE0031734)
- Gokhan Alptekin, TDA Research Inc.

Transformative Carbon Dioxide Capture (FE0031732)
- Deborah Jelen, Electricore Inc.

Transformational Molecular Layer Deposition Tailor-Made Size-Sieving Sorbents for Post-Combustion CO_2 Capture (FE0031730)
- Miao Yu, Rensselaer Polytechnic Institute

Novel Transformational Membranes and Process for CO_2 Capture from Flue Gas (FE0031731)
- Yang Han and Winston Ho, The Ohio State University

Rational Development of Novel Metal-Organic Polyhedra-Based Membranes for CO_2 Capture (FE0031736)
- Haiqing Lin, University at Buffalo, SUNY

Memzyme Technology for Cost-Effective CO_2 Separations in Enhanced Oil Recovery (TCF-17-13314)
- Susan Rempe, Sandia National Laboratories

Carbon Capture Retrofit Tools
- Timothy Fout, NETL

Preliminary Evaluation of the Design Implications of Membrane Modules into Large Scale Post-Combustion Carbon Capture
- Timothy Fout, NETL

Update of Greenhouse Gas Reductions in the Power Industry Using Domestic Coal and Biomass with Pulverized Coal Plants
- Timothy Fout, NETL

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

CO_2 Separation Membranes for Hot Flue Gases (SC0017124)
- Matthew Merrill, Luna Innovations Inc.

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

Modeling of Amine Solutions Reacted With CO_2
- Surya Prakash Tiwari, NETL

Development of Highly Porous Hollow Fiber Support for Post-Combustion Carbon Capture
- Shouliang Yi, NETL

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 CO_2/N_2 Separation
- Krysta Clark, NETL and University at Buffalo, SUNY

Effect of Humidity on PIM-1-Based Membrane Transport Property and Physical Aging
- Zi Tong, NETL

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

Solubility and Diffusivity of Syngas Components Into Novel Pre-Combustion CO_2 Capture Solvents
- Nicholas Siefert, David Hopkinson, Lei Hong, Robert Thompson, Wei Shi and Kevin Resnik, NETL

Enhanced CO_2 Capture Through Process Intensification
- Costas Tsouris, ORNL

Integration of Magnetohydrodynamic (MHD) Power Plant Models via the Framework for Optimization, Quantification of Uncertainty, and Surrogates (FOQUS)
- Frits Byron Soepyan, NETL

CFD Study on the Effective Area Predictions for Different TPMS Structures
- Chao Wang, PNNL

Bench-Scale Experiment and CFD Simulations for Aqueous and Nonaqueous Solvent Systems with Different Packings
- Yucheng Fu, PNNL

The FOQUS Sequential Design of Experiments (SDoE) Module: Present and Future Capabilities
- Towfiq Ahmed, LANL

CCSI Toolset: Developer and User Support Life Cycle
- Keith Beattie, LBNL

Comparing CO_2BOLs Bench-Scale Data and CFD Models Using Sequential Design Experiments (SDoE)
- K. Sham Bhat and John Baca, LANL

CO_2 UTILIZATION

Solar Energy-Powered Material-Based Conversion of CO_2 to Fuels (SC0015855)
- Jeffrey Weissman, Precision Combustion Inc.; Neal P. Sullivan, Colorado School of Mines

Novel Algae Technology for CO_2 Utilization (SC0017077)
- Fred Harrington, Helios-NRG LLC

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

Technology Developments in Carbon Dioxide Electroreduction (SC0015173)
- Brian Skinn, Faraday Techology Inc.

Plasma-Assisted Catalysis for CO_2 and CH_4 (SC0019664)
- Howard Pearlman, Advanced Cooling Technologies Inc.

Unique Nanotechnology Converts Carbon Dioxide to Valuable Products (FE0031707)
- Bingyun Li and Trina Karolchik Wafle, West Virginia University

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 Center for Applied Energy Research

CO_2 and Renewable Electricity Into Chemicals: Formic Acid 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

CO_2 to Fuels Through Novel Electrochemical Catalysis (FE0031716)
- Zehua Pan, Colorado School of Mines

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

Electrochemical Conversion of CO_2 from Coal into Fuels and Chemicals Using a Modified Pem Electrolyzer (FE0031712)
- Etosha Cave, Opus 12 Inc.

Novel Process for CO_2 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 - Madison

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

Field-Scale Testing of the Thermocatalytic Ethylene Production Process Using Ethane and Actual Coal-Fired Flue Gas CO_2 (FE0031713)
- Amit Goyal, Southern Research Institute

Novel Algae Technology to Utilize CO_2 for Value-Added Products (FE0031710)
- Fred Harrington, Helios-NRG LLC

Incorporation of CO_2 Microsorbents Into Bioreactor Chips for Air Capture, Conversion and Purification (TCF-18-15781)
- Congwang Ye, LLNL

Direct Electrochemical Valorization of Captured CO_2 (TCF-18-15716)
- Luis Diaz Aldana, Idaho National Laboratory

CARBON STORAGE

Cost Analysis Associated With Capture, Transport, Utilization and Storage (CTUS) of CO_2
- Tim Grant, NETL

Fundamental Reservoir Properties for High Priority Depositional Environments Targeted for CO_2 Storage
- Johnathan Moore and Dustin Crandall, NETL

Impacts of CO_2-Exposed Microbial Ecology on Reservoir Performance
- Djuna Gulliver, NETL

Field Tools for Direct Monitoring of CO_2 and Brine Impacts in Groundwater Systems
- Paul Ohodnicki, NETL

Update on DOE FE's Virtual Subsurface Data Framework: EDX and ML/NLP Algorithms to Transform Data for Engineered-Natural Systems
- Kelly Rose, NETL

Characterizing Shales as Seals for CO_2 Containment and Shales as Reservoirs for Geologic Storage of CO_2
- Dustin Crandall and Sean Sanguinito, NETL

Embedded Sensor Technology Suite for Wellbore Integrity Monitoring
- Paul Ohodnicki, NETL

CO_2-EOR Monitoring and Greenhouse Gas Life-Cycle Analysis-Integration of 22 Years of Field Operations Data
- Joel Sminchak, Battelle Memorial Institute

Geological Storage of CO_2 in Sub-Seafloor Basalt Offshore Washington State and British Columbia (CarbonSAFE Cascadia Project)
- David Goldberg, Columbia University

Comparison of Resource Estimate Methodologies to Assess CCS Potential for the Northern Niagaran Pinnacle Reef Trend
- Autumn Haagsma, Battelle Memorial Institute

Comparison of Seismic Monitoring Technologies Across Reefs
- Mark Kelley, Battelle Memorial Institute

NRAP Tools and Workflows for Risk Assessment and Management at Geologic Carbon Storage Sites
- Burt Thomas, NETL - NRAP

Considerations for Risk-Based Determination of Post-Injection Closure Period at Geologic Carbon Storage Sites
- Chris Brown, PNNL - NRAP

Risk-Based Conformance Evaluation at Geologic Carbon Storage Sites
- Bailian Chen, LANL - NRAP

Using Modeling of Monitoring for Leak Detection Threshold Evaluation at Geologic Carbon Storage Sites
- Erika Gasperikova, LBNL - NRAP

Best Practices for Addressing Induced Seismicity Associated with Subsurface Injection
- Dennise Templeton, LLNL - NRAP

Coupled Hydro-Mechanical Modeling at Farnsworth West Unit, Ochilitree County, Texas
- Robert Will, New Mexico Tech - PRRC

Stress Evaluation in the Morrow Formation in the Farnsworth Field, Ochilitree, Texas
- Robert Will, New Mexico Tech - PRRC

Optimizing CO_2-EOR Reservoir Management Strategy in the Chester 16 Reef Integrating Distributed Temperature Sensing and Seismic Data
- Ashwin Pasumarti, Battelle Memorial Institute

Revelations in Monitoring
- Katherine Romanak, University of Texas Bureau of Economic Geology

Site Resource Assessment - High Island Blocks - GoMCarb Partnership
- Ramon Trevino, University of Texas at Austin

Clarifying the Likelihood of Subsurface Fluid/Gas Migration Using SIMPA Tool
- Jennifer Bauer, NETL

NATCARB Development for Enhanced Data Access, Discoverability, and Analytics
- Jennifer Bauer, NETL

The Regrid Project: Reservoir Model Grid Conversion for Different CCS Simulators
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Disparities in Measured Single-Phase Permeability for Same Rock, Different Fluids
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Mathematical Analysis of Continuous Surface Measurements for CO_2 and CH_4 Leak Detection, Location, and Quantification
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Impact of Hydrocarbons on Geochemical Reactions and CO_2 Mineralization for Carbon Sequestration Through CO_2-EOR
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Relative Permeability Derived from Capillary Pressure
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Impact of Relative Permeability and Capillary Pressure on Chemical Trapping of Carbon Dioxide in the Subsurface
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Chemo-Mechanical Degradation in Carbonate-Cemented Sandstone Induced from Carbon Sequestration: An Experimental Study of CO_2-Brine-Rock Interation
- Zhidi Wu, Southwest Regional Partnership on Carbon Sequestration

Chemo-Mechanical Impacts of CO_2 Intrusion into Heterogeneous Caprock
- Brian McPherson, Southwest Regional Partnership on Carbon Sequestration

Assessments of Onshore and Offshore CO_2 Storage Potential in Mid-Atlantic States
- Neeraj Gupta, Battelle Memorial Institute

Electromagnetic Geophysical Survey Design for Injection Monitoring During the BEST Project
- Michael Wilt, LBNL

Methodology & Tool for Estimating Offshore Carbon Storage Resource Potential in Saline Aquifer
- Kelly Rose, NETL

The Role of Different Combinations of Dimensionless Numbers and Surface Mineralogy Heterogeneity on Multiphase Flow Properties
- Cheng Chen, Virginia Tech

Reactive Transport Modeling of Water-CO_2-Oil Interactions in the Farnsworth Unit, Texas
- Martin Appold, University of Missouri

Geochemical Modeling of CO_2 Storage in North Dakota Formations
- Arelys Salazar, University of North Dakota Energy & Environmental Research Center

A Simulation Study of the Integrated Mid-Continent Stacked Carbon Storage Hub Project Phase II
- Chantsalmaa Dalkhaa, University of North Dakota Energy & Environmental Research Center

North Dakota CO_2 Storage Feasibility Study – Numerical Simulation Efforts
- Arelys Salazar, University of North Dakota Energy & Environmental Research Center

North Dakota Brine Treatment Test Bed Facility
- Ryan Klapperich, University of North Dakota Energy & Environmental Research Center

Best Practices for CO_2 Geological Storage
- Neil Wildgust, University of North Dakota Energy & Environmental Research Center

Engineering Designs for Integrated Small-Scale CCS System
- Ryan Klapperich, University of North Dakota Energy & Environmental Research Center

Wallula CO_2 Injection Simulations
- Signe White, PNNL

Methodology & Tool for Estimating Offshore Carbon Storage Resource Potential in Saline Aquifers
- Lucy Romeo, NETL

CO_2 Injection Monitoring With an Optimized, Scalable Automated Semipermanent Seismic Array
- Cesar Barajas-Olalde, University of North Dakota Energy & Environmental Research Center

A Large 3C Fiber Optic Borehole Vector Seismic Receiver Array to Survey & Monitor the Subsurface
- Bjorn Paulsson and Mike Wylie, Paulsson Inc.

SimCCS$^{2.0}$: Next Generation of CCS Infrastructure Optimization
- Richard Middleton, LANL

OIL & NATURAL GAS

RBDMS, Fracfocus, and Produced Water Initiative (FE0027702)
- Dan yates and Mark Layne, Ground Water Protection Council Inc.

Resident Inline Robot for Leakage Inspection, Repair and Prevention of Methane Emissions (SC0018906)
- Dave Antanavige, ULC Robotics

Development of Multifunctional Distributed Fiber Sensors for Methane Leak Detection (FE0029063)
- Kevin Peng 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

NFflow Reservoir Simulation for Representing Coupled P & T Effects on Fractures (FWP-1022415 Task 5)
- W. Neal Sams, NETL

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

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

Characterizing Application of CO_2 as a Recovery Agent to Mobilize Hydrocarbons from Shale (FWP-1022415 Task 9)
- Angela Goodman, NETL

The Importance of Organic Matter in Shale Redox (FWP-1022415 Task 3)
- Brandon McAdams, NETL

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

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 CO_2 and Heat
- Tom Buscheck, LLNL

Developing Biomineralization Technology for Ensuring Wellbore Integrity
- Adrienne Phillips and Lee Spangler, Montana State University

Numerical Simulations of Gas Production from Gas Hydrate Reservoirs at the Prudhoe Bay Unit 7-11-12 Pad on Alaska North Slope
- Yongkoo Seol, Harpreet Singh, Xuerui Gai and Ray Boswell, NETL; Evgeniy Myshakin, Battelle Memorial Institute

Comparison of Unsupervised and Supervised Machine Learning Algorithms for Automated Well-Log Processing and Classification
- Harpreet Singh and Yongkoo Seol, NETL; Evgeniy Myshakin, Battelle Memorial Institute

Mix3-HydResSim-GM: A Fully Coupled THCM Simulator for Gas Hydrate Reservoir
- Xuerui Gai and Yongkoo Seol, NETL; Evgeniy Myshakin, Battelle Memorial Institute; Shun Uchida, Rensselaer Polytech Institute; Jeen-Shang Lin, University of Pittsburgh

Pressure Core Characterization and X-Ray CT Visualization Tool: Bridging Between Core-Scale Behavior and Pore-Scale Observations
- Liang Lei, Jeong-Hoon Choi, Xuerui Gai and Yongkoo Seol, NETL

Calibrating Recovery Efficiency Estimates Using Production Data: An Example from the Marcellus Formation in West Virginia
- Ray Boswell, NETL

Building Data-Driven Analytical Tools to Evaluate Offshore Infrastructure Integrity
- Jennifer Bauer and Lucy Romeo, NETL

Data-Enhanced Kick Detection: NETL's Low-Cost Monitoring and Early Detection Technology
- Kelly Rose, NETL

Characterizing Application of CO_2 as a Recovery Agent to Mobilize Hydrocarbons from Shale (FWP-1022415 Task 9)
- Angela Goodman, NETL

Well Cement Behavior and Gas Migration During Early Hydration – Methods to Determine Cement Slurry Gelation to Ensure Wellbore Integrity
- Eilis Rosenbaum, NETL

Flow of a Cement Slurry Modeled as a Generalized Second Grade Fluid
- Chengcheng Tao, NETL

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

NOTES

THANK YOU
FOR ATTENDING

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