CMTC 2017 Technical Program

Monday, July 17, 2017
9:00 AM  5:00 PM  Registration
9:30 AM  12:00 PM  Petra Nova Tour, NRG & JX Nippon
1:00 PM  5:00 PM  Oyster Bayou Field Tour, Denbury Resources
1:00 PM  6:00 PM  Port Arthur Refinery Tour, Air Products & Valero
7:00 PM  8:00 PM  Welcoming Reception

Tuesday, July 18, 2017
7:00 AM  12:00 PM  Registration
7:30 AM  8:00 AM  Coffee (sponsored by ExxonMobil)
7:50 AM  8:00 AM  Greetings from Conference Chairs
8:00 AM  11:50 AM  Tuesday Plenary
8:00 AM  8:35 AM  Keynote 1 - TBD
8:35 AM  9:10 AM  Keynote 2 - Charles McConnell
Executive Director, Rice University Energy and Environmental Initiative
9:10 AM  9:45 AM  Keynote 3 - Jeff Erikson
General Manager for the Americas, Global CCS Institute
Carbon Capture at a Crossroads
9:45 AM  10:05 AM  Break (sponsored by ExxonMobil)
10:05 AM  10:40 AM  Keynote 4 - Janet Gallicci
Chief Executive Officer, National Coal Council
Charting a Course for Coal's Future
10:40 AM  11:15 AM  Keynote 5 - Frederick Eames
Partner, Hunton & Williams
U.S. Direction on CCUS
11:15 AM  11:50 AM  Keynote 6 - Robert Williams
Senior Research Scientist, Andlinger Center for Energy and Environment, Princeton University
Negative Emissions Technologies and Strategies Based on Geological Storage of Photosynthetic CO2
11:50 AM  1:00 PM  Lunch (sponsored by Mitsubishi Heavy Industries)
1:00 PM  1:35 PM  Keynote 7 - Jennifer Holmgren
Chief Executive Officer, LanzaTech
Carbon: The Final Frontier
1:35 PM  2:20 PM  Keynote 8 - Panel Discussion: Opportunities that Exist for CCU Technologies
Chair - Jennifer Holmgren, Chief Executive Officer, LanzaTech
Panelist - Matt Carr, Executive Director, Algae Biomass Organization (ABO)
Panelist - Robert Sturtz, Vice President of Business Development, World Fuel Services
Panelist - Greer Tidwell, Director Environmental Management, Bridgestone
2:20 PM  2:40 PM  Break

BOA - C

Session 1 - Solvent-Based CO2 Capture Systems
(sponsored by Mitsubishi Heavy Industries)

2:40 PM  4:20 PM
Kevin O'Brien, Illinois Sustainable Technology Center, UIUC
CCUS As a Regional Economic Development Tool: Planning and Design Considerations
Jonathan V. Pelgen, University of Kentucky
Reducing Regeneration Energy and Capital Costs in an Advanced Pccc System

Room 330

Session 2 - EOR 1

2:40 PM  3:05 PM
Robert Balch, New Mexico Institute of Mining and Technology
The Intersection of Environment and EOR: How Carbon Capture is Changing Tertiary Recovery

3:05 PM  3:30 PM
Benjamin Cook, University of Wyoming
Electricity in the Oil Patch: The Power Costs of Production, CO2-EOR, Electric Lines and Onsite Generators

Room 329

Session 3 - Business Frameworks

2:40 PM  3:05 PM
Ramón Gil-Egui, Bureau of Economic Geology
Matching Environmental and Economic Performance of CCUS Systems: An Approach to a Decision-Making Methodology for Sustainable Development

3:05 PM  3:30 PM
Sa'd Shannak, KAPSARC
Could China Meet Its CO2 Reduction Goal By CO2-EOR?
### Wednesday, July 19, 2017

**7:00 AM** | 12:00 PM  | Registration
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**7:30 AM** | 8:00 AM  | Coffee
**7:50 AM** | 8:00 AM  | Remarks from the Chair
**8:00 AM** | 11:50 AM  | Wednesday Plenary
**8:00 AM** | 8:35 AM  | Keynote 9 - Haroon Kheshgi
ExxonMobil Research and Engineering Company
The Potential Role of CCS in Electricity and Liquid Fuel Production Sectors
**8:35 AM** | 9:10 AM  | Keynote 10 - Mike Monea
President and CEO, The International CCS Knowledge Centre
Introduction to The International CCS Knowledge Centre
**9:10 AM** | 9:45 AM  | Keynote 11 - Bill Brown
Chief Executive Officer, NET Power, LLC
**9:45 AM** | 10:05 AM  | Break

**10:05 AM** | 10:40 AM  | Keynote 12 - David Greeson
VP Commercial, NRG Carbon 360
**10:40 AM** | 11:15 AM  | Keynote 13 - TBD

**11:15 AM** | 11:50 AM  | Keynote 14 - Juan Anguiano
Oil and Gas Climate Initiative
The Oil and Gas Climate Initiative Works Scope in CCUS
**11:50 AM** | 1:00 PM  | Lunch

### Session 4 - Membrane-Based Capture Systems

**1:00 PM** | 1:15 PM  | Jay Knipe, Membrane Technology and Research, Inc.
Pilot Test Results from a PolarisTM Membrane 1 MWe CO2 Capture System

**1:25 PM** | 1:50 PM  | Shiguang Li, Gas Technology Institute
Pilot-Scale Development of a PEEK Hollow Fiber Membrane Contactor Process for Post-Combustion CO2 Capture

**1:50 PM** | 2:15 PM  | Shilu Fu, American Air Liquide
Bench Scale Testing of Next Generation Hollow Fiber Membrane Modules

**2:15 PM** | 2:40 PM  | William Ampomah, New Mexico Institute of Mining and Technology
Study of CO2-EOR Performance in the Morrow Formation, Ochiltree County, Texas

**2:40 PM** | 3:05 PM  | Edward Ennin, Petroleum Recovery Research Center
Optimizing Reservoir Oil Displacement and CO2 storage in the Texas Farnsworth Unit

**3:05 PM** | 3:30 PM  | Junjie Yang, Baker Hughes
miscible CO2 Flooding Using Horizontal Multi-Fractured Wells in the San Andres Formation, TX – a Feasibility Study

**3:30 PM** | 3:55 PM  | David Merchant, Merchant Consulting
Enhanced Oil Recovery – the History of CO2 Conventional Wag Injection Techniques Developed from Lab in the 1950’s to 2017

**3:55 PM** | 4:20 PM  | Andrew Sexton, Trimeric Corporation
Pilot Plant NO2 Removal with Aqueous Sulfite

**4:20 PM** | 4:40 PM  | Break

### Session 5 - EOR 2

**4:40 PM** | 5:40 PM  | Rapid-Fire Poster Session
Poster Session + Light Reception

### Session 6 - Next Generation Capture Technologies 1

**5:40 PM** | 6:40 PM  | Poster Session + Light Reception

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**Break**

**Lunch**

**Remarks from the Chair**

**Wednesday Plenary**

**Keynote 9**

**Keynote 10**

**Keynote 11**

**Keynote 12**

**Keynote 13**

**Keynote 14**

**Membrane-Based Capture Systems**

**EOR 2**

**Next Generation Capture Technologies 1**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 7 - International Test Center Network Panel</th>
<th>Session 9 - EOR 3</th>
<th>Session 10 - CO2 Storage Case Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:35 PM</td>
<td>Chair: Frank Morton, National Carbon Capture Center</td>
<td>Christian A Dalton, Louisiana State University</td>
<td>Kyle Worth, PTRC</td>
</tr>
<tr>
<td>2:35 PM</td>
<td>Panelist: Jesse Thompson, University of Kentucky</td>
<td>Bayesian Proxy-Based Optimization of Immiscible-CO2 Huff-n-Puff Flooding to Enhance Oil Recovery in Unconventional Shale Oil Reservoirs</td>
<td>Aquistore: the World’s Most Comprehensive Industrial-Scale Field Laboratory for the Investigation of CO2 Geological Storage</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Panelist: Jon Gibbins, UK CCS Research Centre</td>
<td>Japan Trivedi, University of Alberta</td>
<td>Vello A. Kuuskraa, Advanced Resources International</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>Panelist: Abdul Qader, CO2CRC</td>
<td>Evaluating the Potential of CO2 Foam and Polymer Enhanced Foam for Heavy Oil Recovery and CO2 Sequestration</td>
<td>The Project ECOS 2 Phase 2 Carbonsafe Field Project</td>
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<tr>
<th>Time</th>
<th>Session 8 - CCUS Transition Issues: The Legal and Policy Landscape</th>
<th>Session 11 - Offshore Storage</th>
<th>Session 12 - Storage Integrity and Monitoring</th>
<th>Session 13 - CO2 Utilization</th>
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<td>3:25 PM</td>
<td>Chair: Mary Ellen Ternes, Earth &amp; Water Law LLC</td>
<td>Vello A. Kuuskraa, Advanced Resources International</td>
<td>Ahmed Abdulhamid Mahmoud, King Fahd University of Petroleum &amp; Minerals</td>
<td>Brittany Foley, Northeastern University</td>
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<td>3:25 PM</td>
<td>Panelist: Frederick Eames, Hunton &amp; William</td>
<td>TBD</td>
<td>Investigation of Nano Clay-Based Cement Alteration and Associated Conductivity Change in CO2-Rich Environments Relevant to Geological Carbon Sequestration</td>
<td>Carbon Dioxide Recapture Utilizing an Integrated Vertical Aquaponics System</td>
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<td>3:50 PM</td>
<td>Panelist: Charles McConnell, Rice University</td>
<td>Nick Jones, University of Wyoming</td>
<td>Muhammad Zulqarnain, Louisiana State University</td>
<td>Andres Clarens, University of Virginia</td>
</tr>
<tr>
<td>3:50 PM</td>
<td>Panelist: E. Dennis Griffith, Granherne</td>
<td>Wyoming Reservoir Information Tool - a Map and Query Based Web Application for Oil and Gas Reservoirs</td>
<td>Offshore CO2 Storage Potential of the Mafia Continental Shelf, Eastern Gulf of Mexico</td>
<td>Life Cycle Implications of Using CO2-Based Fracturing Fluids As a Substitute for Slickwater</td>
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<td>4:15 PM</td>
<td>Panelist: Victor B. Flatt, University of North Carolina</td>
<td>Nick Jones, University of Wyoming</td>
<td>Muhammad Zulqarnain, Louisiana State University</td>
<td>Brian Tang, Shockwave CO2, LLC</td>
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<td>5:00 PM</td>
<td>Jack C. Pashin, Oklahoma State University</td>
<td>Muhammad Zulqarnain, Louisiana State University</td>
<td>Andres Clarens, University of Virginia</td>
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<td>5:00 PM</td>
<td>Offshore CO2 Storage Potential of the Mafia Continental Shelf, Eastern Gulf of Mexico</td>
<td>Static and Dynamic CO2 Storage Capacity Estimates of a Potential CO2 Geological Sequestration Site in Louisiana Chemical Corridor</td>
<td>Life Cycle Implications of Using CO2-Based Fracturing Fluids As a Substitute for Slickwater</td>
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<td>5:25 PM</td>
<td>Marina Rossi, Virginia Tech</td>
<td>Muhammad Zulqarnain, Louisiana State University</td>
<td>Brian Tang, Shockwave CO2, LLC</td>
</tr>
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<td>5:25 PM</td>
<td>Carbon Dioxide Storage Resource Assessment of the Mid-Atlantic Ocean Seaboard: Analysis of Geological and Geophysical Vintage Data</td>
<td>Risk Based Approach to Identify the Leakage Potential of Wells in Depleted Oil and Gas Fields for CO2 Geological Sequestration</td>
<td>Shockwave CO2</td>
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<tr>
<th>Time</th>
<th>Poster Session</th>
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<td>5:50 PM</td>
<td>6:50 PM</td>
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Thursday, July 20, 2017

7:00 AM  9:00 AM  Registration
7:30 AM  8:00 AM  Coffee
7:50 AM  8:00 AM  Remarks from the Chair
8:00 AM  10:20 AM  Thursday Plenary
  8:00 AM  8:35 AM  Keynote 15 - Frank Morton
          National Carbon Capture Center
          International Collaboration on CCUS R&D
  8:35 AM  9:10 AM  Keynote 16 - Steve Carpenter
          Director, Enhanced Oil Recovery Institute, School of Energy Resources, University of Wyoming
  9:10 AM  9:45 AM  Keynote 17 - Anthony Ku
          Director of Advanced Technologies, National Institute of Clean and low-carbon Energy (NICE), Shenhua Group
          Carbon Management at Shenhua: NICE R&D initiatives and CCUS Demonstrations
  9:45 AM  10:20 AM  Keynote 18 - Jon Gibbins
          Director, UK CCS Research Centre
10:20 AM  10:40 AM  Break

10:40 AM  12:20 PM  Thursday, July 20, 2017

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<thead>
<tr>
<th>Time</th>
<th>Session 14 - Analysis and Modeling for CCUS Technologies</th>
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<tbody>
<tr>
<td>10:40 AM</td>
<td>Dale Keairns, Deloitte Consulting LLP</td>
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<tr>
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<td>Utilizing Systems Analysis to Inform Carbon Capture Technology Development</td>
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<tr>
<td>11:05 AM</td>
<td>Christina Reynolds, University of Michigan</td>
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<td>Mobile Carbon Dioxide Removal: A Baseline Cost Estimate and Testing Protocol</td>
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<td>11:30 AM</td>
<td>Seyed Mostafa Safdarnejad, Intech Process Automation</td>
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<td>Performance Comparison of a Cryogenic and Chemical Absorption Carbon Capture Systems in Response to a Dynamic Electricity Load Profile</td>
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<tr>
<td>11:55 AM</td>
<td>Michael Buckner, Colorado State University</td>
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<td>Automotive CO2 Mitigation Via an Onboard Bosch Reactor System</td>
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<tr>
<th>Time</th>
<th>Session 15 - Storage Characterization</th>
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<tbody>
<tr>
<td>10:40 AM</td>
<td>Ashwin Pasumarti, Battelle Memorial Institute</td>
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<td>Assessing the Effective CO2 Storage Capacity of a Reservoir Using a Geomechanical Framework: A Case Study of a Site in the Arches Province of the Midwest U.S.</td>
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<tr>
<td>11:05 AM</td>
<td>Isis Fukai, Battelle Memorial Institute</td>
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<tr>
<td>11:30 AM</td>
<td>David Riestenberg, Advanced Resources International, Inc.</td>
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<td>Project ECO2s: Geologic Characterization and Preliminary Storage Capacity Estimates</td>
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<tr>
<td>11:55 AM</td>
<td>Autumn Haagsm, Battelle Memorial Institute</td>
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<td>Impact of Geologic Diversity on Static Earth Models in a CO2-EOR Reef Complex</td>
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<tr>
<th>Time</th>
<th>Session 16 - Next Generation Capture Technologies 2</th>
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<tbody>
<tr>
<td>10:40 AM</td>
<td>WS Winston Ho, The Ohio State University</td>
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<tr>
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<td>New Amine-Containing Membranes for CO2 Capture</td>
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<tr>
<td>11:05 AM</td>
<td>Shiguang Li, Gas Technology Institute</td>
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<tr>
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<td>Graphene Oxide-PEEK Hybrid Membrane Process for CO2 Capture</td>
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<tr>
<td>11:30 AM</td>
<td>Mustapha Soukri, RTI International</td>
</tr>
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<td>Hybrid MOF Solid Sorbent-Based CO2 Capture Process for Power and Industrial Applications</td>
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<tr>
<td>11:55 AM</td>
<td>Amanda Warriner, University of Kentucky</td>
</tr>
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<td>Evaluating the Effect of Aqueous Calcium Chloride Desiccant on Cooling Tower Performance in a Heat-Integrated Post-Combustion CO2 Capture System</td>
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12:20 PM  12:30 PM  Closing Remarks