CCUS CONFERENCE WEEK 2022 (Tentative program as of Aug. 27th, 2022)

“Whole Value Chain Carbon Capture, Utilization, and Storage (CCUS)”

Venue: CSM & Golden Hotel, 800 11th St, Golden, CO 80401, USA
Time: Monday Nov. 14th - Friday Nov. 18th, 2022

Provided by: Petroleum Research School of Norway (NFiP), The Colorado-Norway Clean Energy Research and Educational Collaboration (ColNor), NorTex Petroleum Cluster, Rice University and Co-Hosted by Colorado School of Mines.

Sponsored by: Norwegian Research Council Research School Funding Program and NRC/Climit.

Conference Objectives:
1. Emphasize Technological Solutions to the Dual Challenge of Climate Change & Energy Needs
2. Provide a Whole Value Chain Approach Overview within CCUS
3. Demonstrate how CCUS may assist in reducing energy poverty while mitigating climate change
4. Accelerate CCUS collaboration between Norway, Europe, South America, Asia, and USA
5. Provide opportunity for experts in industry and academia to collectively discuss CCUS research
6. Provide PhD students with current CCUS research status and the way forward
7. Emphasize how captured anthropogenic CO₂ may mitigate climate change and provide reliable, affordable and sustainable energy for the future utilizing CCUS in oil production
8. Provide oil industry opportunities to communicate needs to next generation energy engineers

Scientific Program:
Day 1: Climate Perspectives and CO₂ Capture
Day 2: CO₂ Capture and CO₂ Transport
Day 3: CO₂ Storage
Day 4: CO₂ Utilization in Hydrates and in Enhanced Oil Recovery (EOR)
   - Tour of CSM CCUS and EOR Laboratories
Day 5: CO₂ EOR and Whole Value Chain CCUS Future Development

Social Program:
Day 1: - Reception at Table Mountain Inn
Day 4: - Tour of the Coors Brewery
Day 4: - Conference Dinner at The Golden Hotel
Day 1: Monday Nov. 14th
Climate Perspectives and CO₂ Capture

08:30  Registration and Coffee
09:00  Welcome and Symposium Objectives
       Arne Graue, Prof. of Physics, University of Bergen, Norway;
       Chair of the Boards: Petroleum Research School of Norway, ColNor and NorTex Petroleum Cluster
       John Bradford, Vice President for Global Initiatives, Colorado School of Mines

Climate Perspectives

09:30  CCUS Assessment: CCUS in the US - CCS in Europe - Global Importance of CCUS
       Arne Graue, Prof. of Physics, University of Bergen, Norway;
       Chair of the Boards: Petroleum Research School of Norway, ColNor and NorTex Petroleum Cluster
10:00  Reflections on IPCC Perspectives
       Klaus Lackner, Arizona State University
10:30  Coffee
11:00  Global Climate Concerns – The Air We Breathe: It Is Not What it Used To Be
       Russ Schnell, National Oceanic and Atmospheric Administration (NOAA)
11:30  Economic Determinants of Success in CCUS
       Ian Lange, Colorado School of Mines
12:00  Lunch
13:00  SDG & CCUS
       Charles McConnell, University of Houston (TBC)
13:30  The Business Case for Carbon Capture, Utilization, and Storage
       Anna Littlefield, CSM
14:00  Policies and Economics of CCUS
       NN, Baker Institute
14:30  Inflation Reduction Act & Future CCUS in USA
       Morgan Bazilian, CSM
15:00  Coffee
15:30  North American Projects and Policy Landscape vs. Energy Needs in Undeveloped Countries
       Michael J. Nasi, Jackson Walker’s Climate Change & Carbon Management Group
16:30  *Energy Balance of the Climate System: Contribution of Clouds and Aerosol to Uncertain Futures*
James Wilson, University of Denver

17:30  End of Day

19:00 - 21:00  *Reception at Table Mountain Inn*

**Day 2: Tuesday Nov. 15th**
CO₂ Capture and CO₂ Transport

**CO₂ Capture**

09:00  *CO₂ Capture Technologies – An Overview*
Robert Braun, Colorado School of Mines

09:30  *Post Combustion Capture*

10:00  *CO₂ Capture from the Air*
Klaus Lackner, Arizona State University

10:30  Coffee

11:00  Precombustion and Oxyfuel Capture Technologies
*Greg Jackson, Colorado School of Mines*

12:00  *Lunch*

**CO₂ Transport**

13:00  *Pipelines – The Safest Way for CO₂ to Travel*

13:30  Offshore Challenges - Ships or Pipeline

14:00  *The Intersection of Environment and EOR, How Carbon Capture is Changing Tertiary Recovery*
Bob Balch, PRRC, New Mexico Tech

14:30  *CCUS in the USA and Industry Opportunities*
Nigel Jenvy, Baker Hughes

15:00  *Coffee*
15:30  **Panel Debate: USA and the World on CCUS – Energy Poverty, Climate Change & CCUS - Technology Solutions or Climate Ideology?**  
Moderator: Arne Graue, Univ. of Bergen, Norway

17:00  **End of Day**

**Day 3: Wednesday Nov. 16th**

**CO₂ Storage**

09:00  **Overview of CO₂ Storage Options**  
NN, Colorado School of Mines

09:30  **Regulatory Challenges in CO₂ Storage**  
Michael Moore, East-West Strategic Advisors

10:00  **Geomechanics in CO₂ Storage**  
NN, Colorado School of Mines

10:30  **Coffee**

11:00  **CO₂ Atlas Developments and CO₂ Storage Achievements**  
Erik Rundell, Norwegian Petroleum Directorate (TBC)

11:30  **Global Status: CO₂ Storage vs. CCUS & Future Developments**  
Tim Dixon, IEAGHG / Jarad Daniels, Global CCS Institute (TBC)

12:00  **Lunch**

13:00  **CCUS in USA & Global Project Developments - Economics, Technology and Policies**  
Vella Kuuskra, AEC (TBC)

13:30  **The Longship Project: Whole Value Chain CCUS Demonstration Project on the Norwegian Continental Shelf**  
Erik Rundell, Norwegian Petroleum Directorate (TBC)

14:00  **Ongoing and Planned Large Scale CO₂ Storage Projects Worldwide**  
Erik Lindeberg, SINTEF (TBC)

14:30  **Tertiary CO₂ EOR in 23 North Sea Oil Fields - Combined CO₂ Storage Based in Industrial CO₂ Sources**  
Erik Lindeberg, SINTEF (TBC)

15:00  **Coffee**

15:30  **Numerical Simulation of CO₂ Storage in Saline Aquifers**  
Yu-Shu Wu, Colorado School of Mines
16:15  CO₂ Storage, Monitoring, Verification and Accounting  
Bjørn Paulsson, Paulsson Inc.

17:00  End of Day

**Day 4: Thursday Nov. 17th**

CO₂ Utilization in Hydrates and in Enhanced Oil Recovery (EOR)
- Tour of CSM CCUS and EOR Laboratories
- Tour of Coors Brewery

09:00  Fundamentals of Hydrates, Climate Perspectives, and Energy Potentials  
Carolyn Kho, Colorado School of Mines

09:30  CO₂ Storage in Hydrates with Associated Methane Production  
Arne Graue, University of Bergen

10:00  Coffee

10:30  Field Experiences from CO₂ Injections in Hydrates: North Slope CO₂-CH₄ Exchange Project  
Arne Graue, University of Bergen

11:00  CO₂ EOR Assessment  
NN, Oxy Inc.

12:00  Lunch

**CO₂ Utilization in EOR as CCUS**

13:00  CO₂ for EOR – Historical Perspectives, Current State of the Art Technology Status, and Technological Challenges  
Larry Lake, UT, Austin or (Ganesh C. Thakur, Univ. of Houston, 2012 SPE President & Former VP Chevron and Ramanan Krishnamoorti, University of Houston.)

14:00  Utilizing CO₂ in Beer Manufacturing, Tour of Coors Brewery for Group 1/CSM Lab Tour for Group 2

15:00  Utilizing CO₂ in Beer Manufacturing, Tour of Coors Brewery for Group 2/CSM Lab Tour for Group 1

17:00  End of Day

19:00  Conference Dinner at the Golden Hotel
Day 5: Friday Nov. 18th
CO₂ EOR, Policy, Economics and Whole Value Chain CCUS Future Development

09:00  How Foam Develops Apparent Viscosity in CO₂ EOR
       George Hirasaki, Rice University

09:30  CO₂ Foam EOR for Mobility Control
       Arne Graue, University of Bergen

10:00  CO₂ Foam EOR Field Pilots in Texas
       Zachary Alcorn, University of Bergen

10:30  Coffee

11:00  Historical Overview of CO₂ EOR Field Applications
       David Schechter, Texas A&M University (or David Hamilton, Oxy)

12:00  Lunch

13:00  Global Strategies to Meet the Dual Challenge
       Arne Graue, University of Bergen

13:30  Current CO₂ EOR Perspectives
       Hossein Kazemi, Colorado School of Mines

14:30  CO₂ EOR, CCUS, and the Horizontal Revolution in the Permian Basin
       Steve Melzer, Melzer Consulting

15:00  Synthesize Student Learning and Discussion
       John Bradford, Colorado School of Mines

15:30  End of Conference