Program

CO2 Summit III: Pathways to Carbon Capture, Utilization, and Storage Deployment

May 22-26, 2017
Grand Hotel San Michele, Cetraro (Calabria), Italy

Conference Chairs:
Jen Wilcox, Colorado School of Mines
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Frontiers

National Rural Electric Cooperative Association (NRECA)

National Science Foundation

Wyoming Infrastructure Authority

Technical Co-sponsor

American Chemical Society

Monday, May 22, 2017

17:30 - 19:00	Conference Check-in
19:00 - 19:30	Welcome reception
19:30 - 21:00	Dinner

NOTES

- Audiotaping, videotaping and photography of presentations are prohibited.
- Speakers – Please ensure your talk adheres to your given time allotment. Talks that go over their allotment reduce time for valuable discussion and can disrupt the conference program.
- Turn your cellular telephones to vibrate or off during technical sessions.
- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.
- Please do not smoke at any conference functions.
- Please write your name in the front of this program booklet so it can be returned if misplaced.

Tuesday, May 23, 2017

07:30 - 08:30	Breakfast
08:30 - 08:50	**Conference welcome and opening ceremony** **Introduction to conference format and goals** – Jen Wilcox and Niall Mac Dowell
	Plenary 1
08:50 - 09:30	**The Role of CCS for Attaining Long-term Climate Stabilization** Massimo Tavoni, Politecnico Milano, Italy
	Plenary 2
09:30 - 10:10	**Research Opportunities for Negative Emissions and CO_2 Utilization at the Gigatonne Scale** Arun Majumdar, Stanford University, USA
10:10 - 10:30	Open discussion
10:30 - 11:00	Coffee Break
	Technical Session 1: Communication, Policy, and Economics Around CCUS Deployment
11:00 - 11:20	**A Preliminary Political Economy of Net-negative Emissions Technologies** David M. Reiner, University of Cambridge, United Kingdom
11:20 - 11:40	**Manufacturing our Future: Industries, European Regions and Climate Action** Jonas Helseth, Bellona Europa, Belgium
11:40 - 12:00	**Towards Industry, Policy, and Civil Society Action on Carbon Removal** Noah Deich, Center for Carbon Removal, USA
12:00 - 12:30	**Pathways to CCS Commercialization** Wilfried Maas, Shell, Netherlands
12:30 - 12:50	Open discussion
12:50 - 14:20	Lunch and open time
	Plenary 3
14:20 - 15:00	**Carbon Dioxide Removal** Howard J. Herzog, Massachusetts Institute of Technology, USA
	Plenary 4
15:00 - 15:40	**Land Use Implications of Negative Emissions from BECCS** Sabine Fuss, Mercator Research Institute on Global Commons and Climate Change, Germany

Tuesday, May 23, 2017 (continued)

15:40 - 16:00	Open discussion
16:00 - 16:30	Coffee break
	Technical Session 2: Opportunities and Examples of CDR
16:30 - 16:50	**The Transition of CCS from Fossil Fuel CO_2 Control to Negative Emissions** Roger D. Aines, Lawrence Livermore National Laboratory, USA
16:50 - 17:10	**Can BECCS Deliver Sustainable and Resource-efficient Negative Emissions?** Mathilde Fajardy, Imperial College London, United Kingdom
17:10 - 17:30	**Sustainable BECCS Pathways Evaluated by an Integrated Assessment Model** Etsushi Kato, Institute of Applied Energy, Japan
17:30 - 17:50	**Negative Emissions on South East Asia: Renewable Energy Optimization with BECCS for Indonesia** Florian Kraxner, International Institute for Applied System Analysis, Austria
17:50 - 18:10	**Slicing the Pie: How Big Could Carbon Dioxide Removal Be?** Peter Psarras, Colorado School of Mines, USA
18:10 - 18:30	Open discussion
18:30 - 19:30	Reception and poster session (5-minute presentations by poster presenters) Wine, beer, and light snacks
19:30 - 21:00	Dinner

Wednesday, May 24, 2017

07:30 - 08:30	Breakfast
	Plenary 5
08:30 - 09:10	**Adsorption Processes for CO_2 Capture: An Overview** Paul Webley, The University of Melbourne, Australia
	Plenary 6
09:10 - 09:50	**A Membrane Approach to CO_2 Capture** Richard W. Baker, Membrane Technology Research, USA
09:50 - 10:10	Open discussion
10:10 - 10:40	Coffee break
	Technical Session 3: Advanced Conversion and CO_2 Separation Processes
10:40 - 11:00	**Membrane Condenser: Direct and Indirect Support to CO_2 capture** Enrico Drioli, ITM-CNR, Italy
11:00 - 11:20	**Advanced Membrane Operations in CO_2 Capture** Giuseppe Barbieri, ITM-CNR, University of Calabria, Italy
11:20 - 11:40	**Designing Materials and Processes for CO_2 Capture with Solid Sorbents** Adam H. Berger, Electric Power Research Institute, USA
11:40 - 12:00	**Carbon Dioxide Reforming with Natural Gas and Coal using Chemical Looping** Andrew Tong, The Ohio State University, USA
12:00 - 12:20	Open discussion
12:20 - 13:40	Lunch and open time
	Plenary 7
13:40 - 14:20	**International Efforts of the National Carbon Capture Center** Roxann Laird, Southern Company Services, USA
	Plenary 8
14:20 - 15:00	**Carbon Management at Shenhua – R&D Initiatives and CCUS Demonstrations** Anthony Ku, National Institute of Clean-and-Low-Carbon Energy, China
15:00 - 15:20	Open discussion
15:20 - 15:50	Coffee break

Wednesday, May 24, 2017 (continued)

	Technical Session 4: System Integration Approaches *Sponsored by Beijing-based National Institute of Clean and Low-Carbon Energy (NICE)*
15:50 - 16:10	**On the Operation of CCS Within a Diverse Energy System** Niall Mac Dowell, Imperial College London, United Kingdom
16:10 - 16:30	**Carbon Capture and Geologic Sequestration from Intermittent Use of Fossil Fuels** Susan D. Hovorka, University of Texas at Austin, USA
16:30 - 16:50	**Reversible Solid Oxide Cells as a Flexible, Dispatchable Resource for Grid-Energy Storage and Natural Gas Production Using CO_2 and CH_4** Robert Braun, Colorado School of Mines, USA
16:50 - 17:10	**Integration of carbon capture with renewable energy in power generation and steel manufacturing** Ali Abbas, The University of Sydney, Australia
17:10 - 17:30	**A bio-physical and net-energy comparison of CCS and renewable energy baseload systems** Sgouris Sgouridis, Masdar Institute, United Arab Emirates
17:30 - 18:00	Open discussion
18:00 - 19:30	Reception and poster session (5-minute presentations by poster presenters) Wine, beer, and light snacks
19:30 - 21:00	Dinner

Thursday, May 25, 2017

07:30 - 08:30	Breakfast
	Plenary 9
08:30 - 09:10	**Cement, CCS and CO_2 Uptake, Including an Update on the EU LEILAC Project** Paul Fennell, Imperial College London, United Kingdom
	Plenary 10
09:10 - 09:50	**To Utilize or Not to Utilize? A Life-Cycle Assessment Perspective on Carbon Dioxide Utilization** Andre Bardow, Aachen University, Germany
09:50 - 10:10	Open discussion
10:10 - 10:40	Coffee break
	Technical Session 5: CO_2 Capture from Industrial Sources and CO_2 Utilization
10:40 - 10:55	**What We Talk About When We Talk About CCUS: New Tactics for Communicating the Opportunities and Risks** Marcius H. T. Extavour, XPRIZE, USA
10:55 - 11:15	**CO_2 Capture from Industrial Sources by High-temperature Sorbents** Matteo C. Romano, Politecnico di Milano, Italy
11:15 - 11:35	**Lifecycle CO_2 emissions from US bioethanol production with CCS** Sean T. McCoy, Lawrence Livermore National Laboratory, USA
11:35 - 11:55	**CCUS as a Regional Economic Development Tool: Planning and Design Considerations** Kevin O'Brien, Illinois Sustainable Technology Center, USA
11:55 - 12:15	**Metastable hydrated carbonates for algae biofuel production** Valentina Prigiobbe, Stevens Institute of Technology, USA
12:15 - 12:35	**Catalyzing a CO_2-neutral Society** Mark Saeys, Ghent University, Belgium
12:35 - 12:50	**Maximizing the Mitigation Potential of Curtailed Wind: A Comparison Between Carbon Capture and Utilization, and Direct Air Capture Processes for the UK** Habiba A. Daggash, Imperial College London, United Kingdom
12:50 - 13:10	Open discussion

Thursday, May 25, 2017 (continued)

13:10 - 15:30	Lunch and open time
	Plenary 11
15:30 - 16:10	**Harnessing Peridotite Alteration for Carbon Capture and Storage** Peter Kelemen, Columbia University, USA
	Plenary 12
16:10 - 16:50	**Status, Challenges, and Potential Capacity of Reliable Geologic Storage of CO_2** Susan D. Hovorka, University of Texas at Austin, USA
16:50 - 17:10	Open discussion
17:10 - 17:40	Coffee break
	Technical Session 6: Reliable CO_2 Storage Technologies
17:40 - 18:00	**The Potential of Carbon Storage in the Ocean as Bicarbonate** Phil Renforth, Cardiff University, United Kingdom
18:00 - 18:20	**Pathways to Accelerated Carbon Mineralization in Mine Tailings** Gregory M. Dipple, University of British Columbia, Canada
18:20 - 18:40	**Carbonation of Industrial Residues for CCUS: Fundamentals, Energy Requirements and Scale-up Opportunities** Renato Baciocchi, University of Rome Tor Vergata, Italy
18:40 - 19:00	Open discussion
19:00 - 21:30	Conference banquet and award ceremony

Friday, May 26, 2017

07:30 - 08:30	Breakfast
08:30 - 09:00	**Closing remarks and next steps** - Jen Wilcox and Niall Mac Dowell
09:00 - 10:30	***Technical Session 7: Frontiers Special Issue Development***
10:30 - 11:00	Coffee break
11:00 - 12:00	***Technical Session 7 continued: Frontiers Special Issue Development***
12:00 - 13:30	Lunch
13:30	Conference conclusion

Poster Presentations

1. **Cost-effective, near-term deployment of carbon capture and storage from biorefineries in the United States**
   Daniel L. Sanchez, Carnegie Institution for Science, USA

2. **Opportunities for industrial CO_2 capture and utilization in the US**
   Peter Psarras, Colorado School of Mines, USA

3. **Analysis of reversible solid oxide cell technology for grid-energy storage and synthetic natural gas production with CO_2**
   Evan P. Reznicek, Colorado School of Mines, USA

4. **What are the key processes of CO_2 storage to represent in energy systems models? A dynamic model of CO_2 storage in the UK Bunter Sandstone**
   Clea Kolster, Imperial College London, United Kingdom

5. **Can BECCS efficiently and sustainably remove CO_2 from the atmosphere?**
   Mathilde Fajardy, Imperial College London, United Kingdom

6. **Power-to-transport: Using curtailed wind to run CCU processes**
   Habiba A. Daggash, Imperial College London, United Kingdom

7. **CO_2 capture from the industry sector**
   Praveen Bains, Stanford University, USA

8. **Design and operations optimization of membrane separation for flexible carbon capture from natural gas combined cycle systems**
   Mengyao Yuan, Stanford University, USA

9. **Geospatial analysis of BECCS deployment potential in the U.S.**
   Ejeong Baik, Stanford University, USA

10. **Applying potential BECCS solutions to the US coal sector: New coal boom or bust?**
    Florian Kraxner, International Institute for Applied Systems Analysis (IIASA), Austria

11. **The water-energy-carbon-land nexus: Optimising the BECCS supply chain**
    Solène Chiquier, Imperial College London, United Kingdom

12. **Photocatalityc membrane reactor for CO_2 conversion**
    Giuseppe Barbieri, ITM-CNR, Italy

13. **H2 production in Palladium-based Membrane Reactor**
    Nora Buggy, Colorado School of Mines, USA

14. **Mineral carbonation opportunities in the western United States**
    Christopher M. Caskey, Colorado School of Mines, USA