

# PRO GRA MME

# CLIMIT SUMMIT

7—9 FEBRUARY 2023



Bølgen Kulturhus  
Sanden 2, NO-3264 Larvik, Norway

## TUESDAY 7 FEBRUARY

Side events

## WEDNESDAY 8 FEBRUARY

Side events

Main programme

## THURSDAY 9 FEBRUARY

Main programme

## CCS SPEED DATING

---

Capture [Bølgen 1]

Transport & Value chain [Bølgen 2]

Storage [Bølgen 3]

## TECHNICAL SESSIONS

---

Capture & Business models [Bølgen 1]

Transport & Value chain [Bølgen 2]

Storage [Bølgen 3]

# TUESDAY 7 FEBRUARY

## Side events

12:30 Side event organised by  
**CO<sub>2</sub>DataShare/NCCS**  
(Blåboksen)

Side event organised by  
**Technology Centre Mongstad (TCM)**  
(Bølgen 3)

**14:00 BREAK**

14:30 Side event organised by **ECO<sub>2</sub>S** (Blåboksen)  
Incl. **Networking event** (Sanden)

[Side event programme](#)

# WEDNESDAY 8 FEBRUARY

## Side events

09.00	Side event organised by <b>ECCSEL ERIC</b> (Bølgen 3)	Side event organised by <b>Mission Innovation</b> (Bølgen 1)
10:00	Side event organised by <b>ACT</b> (Bølgen 2)	

[Side event programme](#)

## Main programme

<b>11:00</b>	<b>LUNCH</b>	[Common area]
Moderator: <b>Kristin Halvorsen</b> , <i>Cicero</i>		[Storsalen]
11:50	Welcome - <b>Arvid Nøttveit</b> , <i>Leader Programme Board</i>	
12:00	The Government's CCS policies - <b>Terje Aasland</b> , <i>The Norwegian Ministry of Petroleum and Energy</i>	
12:15	Strong positive momentum for CCUS in the EU - <b>Per-Olof Granström</b> , <i>Zero Emissions Platform</i>	
12:30	Update on Recent Carbon Management Developments in the United States - <b>Mark Ackiewicz</b> , <i>The U.S. Department of Energy</i>	
12:45	Constructing Europe's first multi-source CCS chain – learnings and future thoughts - <b>Roy Vardheim</b> , <i>Gassnova</i>	
12:55	Large-scale deployment of CCS depends on comprehensive R&D - <b>Rune Volla</b> , <i>The Research Council of Norway</i>	
<b>13:05</b>	<b>BREAK</b> – go to the CCS Speed Dating	
13:30	<b>CSS Speed Dating</b> [see separate programme]  - <b>Capture</b> (BØLGEN 1) - <b>Transport &amp; Value chain</b> (BØLGEN 2) - <b>Storage</b> (BØLGEN 3)	
<b>16:40</b>	<b>BREAK</b>	
Moderator: <b>Kristin Halvorsen</b> , <i>Cicero</i>		[Storsalen]
17:10	ACT & CETP: How International Collaboration Fosters CCUS Research and Innovation - <b>Aage Stangeland</b> , <i>The Research Council of Norway</i>	
17:25	Mission Innovation - <b>Mark Ackiewicz</b> , <i>The U.S. Department of Energy</i>	
17:45	Dialogue – What actions are needed to deploy CCS worldwide? - <b>Mark Ackiewicz</b> , <i>U.S. Department of Energy</i> - <b>Jan Gabor</b> , <i>Mo Industripark</i>	
19:15	<b>APERITIF AND DINNER</b>	[Farris Bad]

# THURSDAY 9 FEBRUARY

## Main programme

- 
- 08:45 Welcome [Storsalen]  
Moderator: **Kristin Halvorsen**, *Cicero*
- 
- 08:50 Carbon Capture and Storage (CCS) scale-up – building on Northern Lights and 26 years of CO<sub>2</sub> storage in the North Sea  
- **Torbjørn Klara Fossum**, *Equinor*
- 
- 09:00 LINCCS; Compact, low OPEX CO<sub>2</sub> capture offshore  
- **Rikard Kinn**, *Aker Solutions*  
Authors: Marit J. Mazzetti, SINTEF Energy Research
- 
- 09:10 Disrupting blue hydrogen production  
- **Thomas Reinertsen**, *Hydrogen Mem-Tech*
- 
- 09:20 Building commercility for CCUS – the road from Longship to full European deployment  
- **Jon Christopher Knudsen**, *Aker Carbon Capture*
- 
- 09:30 BREAK** – go to the technical sessions
- 
- 10:00 Technical sessions** [separate programme]:  
- **Capture & Business models** (Bølgen 1)  
- **Transport & Value chain** (Bølgen 2)  
- **Storage** (Bølgen 3)
- 
- 11:00 LUNCH** [Common area]
- 
- 12:00 Longship Sails On [Storsalen]  
Moderator: **Kim Hjørdar**, *Illustrert Historie*  
- **Vetle Houg**, *Heidelberg Materials Norway*  
- **Jannicke Gerner Bjerkås**, *Hafslund Oslo Celsio*  
- **Christian Buch Hansen**, *Northern Lights*  
- **Filip Neele**, *TNO*

## CCS SPEED DATING:

# Capture [Bølgen 1]

## CCUS INDUSTRY CLUSTERS

- 
- 13:30 Introduction  
Moderator: **Jørild Svalestuen**, *CLIMIT*
- 
- 13:40 CO<sub>2</sub> HUB Nord, pilot CO<sub>2</sub> capture in Mo Industrial park  
- **Jan Gabor**, *Mo Industripark*  
Author: SINTEF Helgeland
- 
- 13:50 Mid Norway CCS Cluster  
- **Bjørn Hølaas**, *Statkraft Varme*
- 
- 14:00 CCS Haugalandet  
- **Tiril Fjeld**, *Haugaland Industrial Park*
- 
- 14:10 Eyde-Klyngen – Ongoing CCS projects a Returkraft  
- **Ketil Bergmann**, *Returkraft*
- 
- 14:20 BREAK**
- 
- 15:00 GICSS – A Joint Solution Approach to CCS in Grenland  
- **Kristian L. Aas**, *SINTEF*
- 
- 15:10 Borg CO<sub>2</sub>: Full-scale capture, storage and terminal  
- **Guro Nereng**, *Borg CO<sub>2</sub>*  
Authors: Jon Hermansen & Camilla Brox
- 

## RESEARCH TO DEVELOP FUTURE CO<sub>2</sub> CAPTURE SOLUTIONS

Moderator: **Åse Slagtern**, *CLIMIT*

- 
- 15:20 Carbon capture by solid sorbents: Materials and process  
**De Chen**, *NTNU*  
Authors: Dumitrita Spinu & Kumar Route
- 
- 15:30 A novel hybrid process for membrane-assisted hydrogen production with CO<sub>2</sub> capture through liquefaction  
- **Thijs Peters**, *SINTEF*
- 
- 15:40 CCS for the process industry – an example from FME NCCS  
- **Mona Mølnvik**, *SINTEF*
- 
- 15:50 SCOPE - Sustainable OPEration of post-combustion - Capture plants  
- **Hanne Kvamsdal**, *SINTEF*
- 
- 16:00 Novel molten/solid composite oxygen transport membranes for CO<sub>2</sub> capture  
- **Zuoan Li**, *SINTEF Industry*  
Authors: Wen Xing, Linn Katinka Emhjellen, Reidar Haugsrud, Marie-Laure Fontaine & Rune Bredesen
- 
- 16:10 Accelerating Carbon Capture using Oxyfuel technology in Cement production (AC20Cem)  
- **Mario Ditaranto**, *SINTEF*
- 
- 16:20 EverLoNG  
- **Ragnhild Skagestad**, *SINTEF*
- 
- 16:30 LOUISE – Low-Cost CO<sub>2</sub> Capture by Chemical Looping Combustion of Waste-Derived Fuels  
- **Øyvind Langørgen**, *SINTEF*  
Authors: Inge Saanum
-

## Transport & Value chain [Bølgen 2]

- 
- 13:30 Introduction  
Moderator: **Tore Hatlen**, *CLIMIT*
- 
- 13:40 Impact of CO<sub>2</sub> impurities and additives in CCS (ImpreCCS)  
- **Trine Mykkeltvedt**, *NORCE (Norwegian Research Centre)*  
Authors: Sigurd Løvseth, Sarah Gasda, Bahare Khosravi & Yessica Arrelano
- 
- 13:50 Kjeller Dense Phase CO<sub>2</sub> Corrosion Project (KDC-III)  
- **Gaute Svenningsen**, *Institute for Energy Technology*  
Authors: Bjørn Helge Morland & Arne Dugstad
- 
- 14:00 CO<sub>2</sub> Safe&Sour JIP: H<sub>2</sub>S challenges in CCS pipelines  
- **Klas Solberg**, *DNV*
- 
- 14:10 Monitoring and Control of Networks for CCS  
- **Yessica Arellano**, *SINTEF*
- 
- 14:20 BREAK**
- 
- 15:00 Phenomenological study of unstable two-phase CO<sub>2</sub> flow in a pipeline system  
- **Luciano E. Patruno**, *Institute for Energy Technology*  
Authors: Maria Fernandino & Carlos Dorao
- 
- 15:10 Enable successful CCS projects through accurate and robust simulation of multiphase transport and injection of pure CO<sub>2</sub> and CO<sub>2</sub> dominated fluids  
- **Norbert Hoyer**, *Schlumberger (SLB)*  
Authors: Alexandre Brigadeau & Lars Rønning
- 
- 15:20 Kongsberg Digital «Ledaflow + GEM simulation of CO<sub>2</sub> injection»  
- **Lars-Erik Svabø**, *Kongsberg Digital*
- 
- 15:30 CO<sub>2</sub>los III  
- **Ragnhild Skagesta**, *SINTEF*  
Author: Gisle Nysæter
- 
- 15:40 PCO<sub>2</sub> Technology review and design verification  
- **Per Lothe**, *Knutsen OAS*
- 
- 15:50 Technology Qualification of a low-pressure CO<sub>2</sub> shipping solution  
- **Gabriele Notaro**, *DNV*  
Authors: Jed Belgaroui, Knut Maråk, Roe Tverrå, Steve Burthom & Erik Mathias Sørhaug
- 
- 16:00 Development of technical standards to support commercialization and further R&D for CCUS  
- **Ingvild Ombudstvedt**, *IOM Law*
- 
- 16:10 Developing value chains for CO<sub>2</sub> storage and blue hydrogen in Europe  
- **Rolf Golombek**, *Frisch Centre*
- 
- 16:20 Socio-technical drivers, opportunities and challenges for large-scale CCUS (CaptureX)  
- **Markus Steen**, *SINTEF*
- 
- 16:30 Does the nationality of CO<sub>2</sub> matter? Public perceptions of a Northern European market for CO<sub>2</sub> storage (CCSMARKET)  
- **Åsta Dyrnes Nordø**, *NORCE (Norwegian Research Centre)*  
Authors: Gisle Andersen & Christine Merk
-

## CCS SPEED DATING:

# Storage [Bølgen 3]

---

13:30	Introduction Moderator: <b>Kari-Lise Rørvik</b> , CLIMIT
13:40	REX-CO <sub>2</sub> : Re-using EXisting wells for CO <sub>2</sub> storage operations - <b>Nils Opedal</b> , SINTEF
13:50	Learnings from a naturally occurring CO <sub>2</sub> laboratory in Utah, US - <b>Elin Skurtveit</b> , NGI Authors: Ivar Midtkandal & Alvar Braathen
14:00	Accelerating CSEM technology for efficient and quantitative CO <sub>2</sub> monitoring (EM4CO <sub>2</sub> ) - <b>Anouar Romdhane</b> , SINTEF Authors: Joonsang Park, Julien Porté, Bastien Dupuy & Kjetil Eide
14:10	SafeGuard: New technology for long-term monitoring and risk mitigation of CO <sub>2</sub> storage sites - <b>Maximilian Leinenbach</b> , Fishbones
<b>14:20</b>	<b>BREAK</b> Moderator: <b>Kisten Haaberg</b> , CLIMIT
15:00	ACTOM, Act on offshore monitoring - <b>Guttorm Alenda</b> , UiB Authors: The whole ACTOM team
15:10	Real-Time Monitoring for Safe Geological CO <sub>2</sub> Storage - <b>Julian Löw</b> , Geomec Author: Fred J. Santarelli
15:20	Automating the evaluation of the well barrier - <b>Tore Lie Sirevaag</b> , Equanostic Authors: Erlend Jørgensen, Karen Lees, Jenny Malmberg
15:30	ACT2 DIGIMON - <b>Arvid Nøttveit</b> , NORCE (Norwegian Research Centre)
15:40	HPC-simulation software for the gigatonne storage challenge. OPM-Flow - <b>Tor Harald Sandve</b> , NORCE (Norwegian Research Centre) Authors: Atgeirr Rasmussen (SINTEF), Kai Bao (SINTEF), Alf-Birger Rustad (Equinor), Cíntia Gonçalves Machado (TNO)
15:50	AddStorage-Analogue-site data-driven study for characterization and monitoring of deep CO <sub>2</sub> storage sites - <b>Lars Grande</b> , NGI Authors: Joonsang Park & Nazmul Haque Mondol
16:00	Value of ground deformation for monitoring CO <sub>2</sub> storage sites - <b>Bahman Bohloli</b> , NGI
16:10	Accurate CO <sub>2</sub> monitoring using quantitative joint intervision for large scale on-shore and offshore storage applications - <b>Michael Jordan</b> , SINTEF
16:20	SNOWPACCS – Challenges with post-mortem investigation of well integrity at Mont Terri - <b>Pierre Cerasi</b> , SINTEF Authors: Anna Stroisz, Laura Edvardsen, Hossain Bhuiyan & Nicolaine Agofack
16:30	In-situ stress and failure prediction for CO <sub>2</sub> storage sites - <b>Elin Skurtveit</b> , NGI Authors: Tore I. Bjørnarå, Emma Michie, Sarah Gasda, Eirik Keilegavlen & Alvar Braathen

---

TECHNICAL SESSION:

# Capture & Business models [Bølgen 1]

Moderator: **Svein Gunnar Bekken**, *CLIMIT*

---

10:00 A climate cure for the Waste-to-Energy industry in Norway  
- **Bjørn Hølaas**, *Statkraft Varme*

---

10:15 Protonic membrane reformer technology for conversion of natural gas to hydrogen and CO<sub>2</sub>  
- **Harald Malerød-Fjeld**, *CoorsTek Membrane Sciences*

---

10:30 Enabling carbon capture with oxy-fuel combustion technology for the Waste-to-Energy sector (CAPEWASTE)  
- **Mario Ditaranto**, *SINTEF*  
*Authors: Michael Becidan, Chao Fu, Mette Bugge (SINTEF Energi), Johnny Stuen (City of Oslo REG)*

---

10:45 Membranes with Aligned nanostructures for CO<sub>2</sub> separation  
- **Luca Ansaloni**, *SINTEF*

---



TECHNICAL SESSION:

## Transport & Value chain [Bølgen 2]

Moderator: **Tore Hatlen**, *CLIMIT*

---

10:00 CO<sub>2</sub> EPOC: The effect of CO<sub>2</sub> on polymer materials used in the CO<sub>2</sub> transport network

- **Ben Alcock**, *SINTEF*

Authors: Luca Ansaloni, Thijs Peters, Birgitte Vågenes (*SINTEF*), Anu Muthukamatchi, Reidar Lund (*Univ. Oslo*), Matteo Minelli, Virginia Signorini and Emma Ghiara (*Univ. Bologna, Italy*)

---

10:15 Energy export and CO<sub>2</sub> infrastructure development – CleanExport

- **Julian Straus**, *SINTEF*

---

10:30 Stella Maris CCS – A large scale maritime solution

- **Frank Wettland**, *Altera Infrastructure*

---

10:45 Design and Operation of Carbon Dioxide Pipelines – Key topics to be addressed

- **Bente Leinum**, *DNV*

---

## TECHNICAL SESSION:

# Storage [Bølgen 3]

Moderator: **Anne-Mette Cheese**, *Gassnova*

---

10:00 How fast can we get CO<sub>2</sub> into geological formations  
– without getting operational problems?  
- **Jonas Solbakken**, *NORCE (Norwegian Research Centre)*

---

10:15 Extended High Resolution (XHR) Seismic for Mapping  
and Monitoring of CO<sub>2</sub> reservoirs  
- **Tone Holm-Trudeng**, *Magseisfairfield*  
Authors: Roya Dehghan Niri, Åsmund Sjøen Pedersen,  
Sandrine David and Paul West

---

10:30 Seismicity monitoring in preparation for large-scale  
CO<sub>2</sub> storage offshore Norway (HNET)  
- **Philip Ringrose**, *Equinor*  
Authors: HNET project team

---

10:45 Improved workflow for fault risk assessment in  
faulted CO<sub>2</sub> storage sites  
- **Elin Skurtveit**, *NGI*  
Authors: Tore I. Bjørnarå, Emma Michie, Sarah Gasda,  
Eirik Keilegavlen, Alvar Braathen

---