

BIGCCS Final Conference

- Results from the BIGCCS Centre

Clarion Hotel & Congress
Trondheim
October 26-27, 2016



Conference Program



October 26

INTRODUCTION (0930-1130)

Welcome

BIGCCS in perspective

Nils A. Røkke, Executive Vice President Sustainability, SINTEF

NTNU role and contributions

Johan E. Hustad, Pro-Rector Innovations and Director Strategic Research Area Energy, NTNU

Statoil's position in CCS

Per Ivar Karstad, Project Manager, Statoil ASA

The Norwegian full-scale CCS project

Kristin Myskja, Assistant Director General, Ministry of Petroleum and Energy

The FME scheme – 8 years of experience

Åse Slagtern, Special Adviser, Research Council of Norway

TOTAL learnings from BIGCCS and outlook

Arve Erga, Head of Production Technology Research, TOTAL E&P Norge

"BIGCCS in 6 minutes"

Malin Torsæter, Senior Researcher, SINTEF Petroleum

1130-1230 Lunch/Posters

CO₂ STORAGE (1230-1400)

Introduction – BIGCCS paving the way for large-scale CO₂ storage

Grethe Tangen, Senior Researcher, SINTEF Petroleum Research

Pressured by saturation and uncertainty? Monitoring helps!

Peder Eliasson, Research Manager, SINTEF Petroleum Research

Geomechanics, the libero player: From capacity estimate to monitoring via near-well integrity

Pierre Cerasi, Research Manager, SINTEF Petroleum Research

Geomechanical issues associated with CO₂ storage reservoirs

Sohrab Gheibi, PhD student, NTNU

Avoiding CO₂ leakage through active and abandoned wells

Malin Torsæter, Senior Researcher, SINTEF Petroleum Research

Report from international research partner on well integrity (short video)

Susan Carroll, Principal Investigator, Lawrence Livermore National Laboratory

Large-scale CO₂ storage – The art of safely fitting cubic kilometres of CO₂ into tiny rock pores
Alv-Arne Grimstad, Senior Researcher, SINTEF Petroleum Research

1400-1500 Posters

CO₂ TRANSPORT (1500-1600)

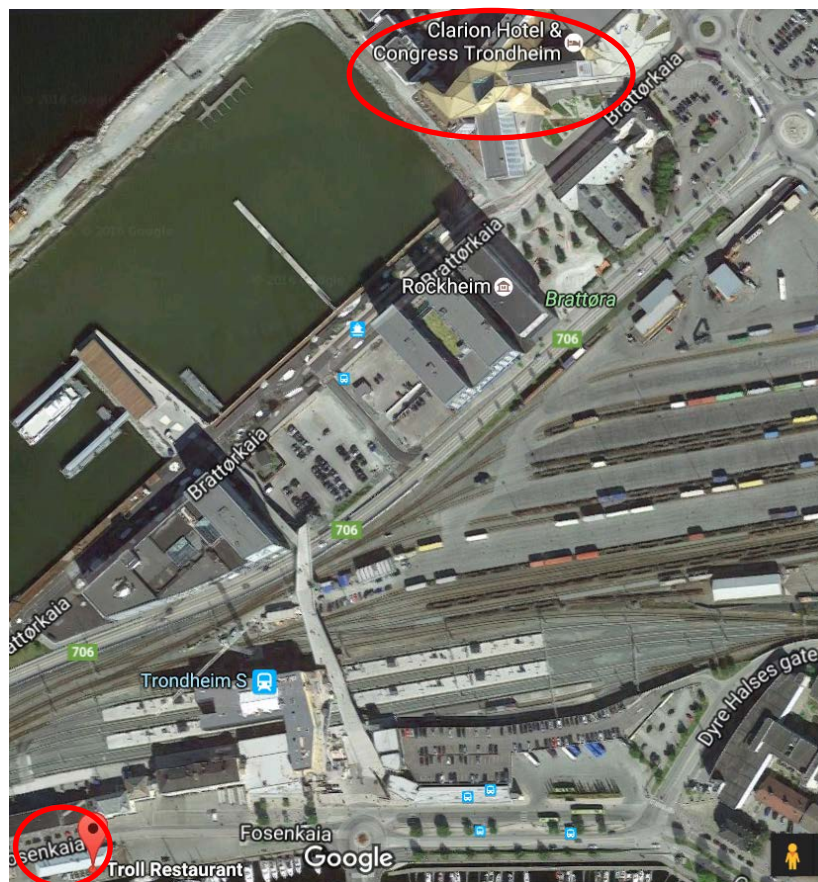
CO₂ Transport – achievements summary Task 2.1 and 2.2
Svend Tollak Munkejord, Chief Scientist, SINTEF Energy Research

BIGCCS, Gassco and CO₂ transport
Gudmundur Kristjansson, Manager R&D / Svein Solvang, Principal Engineer, Gassco

1600-1615 Discussion

1615-1730 Posters

1900 Dinner at [Troll Restaurant](#), Fosenkaia



October 27

CO₂ CAPTURE (0830-1030)

Introduction – BIGCCS paving the way for CO₂ capture

Partow P. Henriksen, Research Manager, SINTEF Materials and Chemistry

Dynamic modelling at TCM

Nina Enaasen Flø, Process Engineer, Technology Centre Mongstad

Efficiency and cost of CO₂ capture from the Natural Gas Combined Cycle – NGCC

Kristin Jordal, Senior Researcher, SINTEF Energy Research

Fabrication and development of ceramic membranes for pre-combustion CCS

Jonathan Polfus, Researcher, SINTEF Materials and Chemistry

Development of model burner with distributed hydrogen fuel injection: from idea to laboratory

Andrea Gruber, Senior Researcher, SINTEF Energy Research

Peter Kutne, Researcher, DLR

Oxy-Combustion – Chemical Looping Combustion – with video

Nils E. Haugen, Researcher, SINTEF Energy Research

Toward demonstration of Natural gas fired Oxyfuel power plant

Mario Ditaranto, Research Manager, SINTEF Energy Research

1030-1130 Posters

CO₂ VALUE CHAIN / ACADEMIA (1130-1300)

A Tool for Integrated Multi-criteria Assessment of the CCS Value Chain

Amy Brunsvold, Researcher, SINTEF Energy Research

Illustration of the benefits of a value chain analysis tool through a cement case study

Simon Roussanaly, Researcher, SINTEF Energy Research

Integrated techno-economic assessment for membrane-based CO₂ capture

Rahul Anantharaman, Researcher, SINTEF Energy Research

Experiences from PhD and Postdoc candidates in BIGCCS

Video

Achievements of the Academia sub-program

Truls Gundersen, Professor, NTNU

Conclusions and final remarks

Mona Mølsvik, Research Director, SINTEF Energy Research

1300-1400 Lunch/Posters

Poster at the BIGCCS Final Conference

CO₂ Capture

1. Metal-organic framework materials for simultaneous hydrogen purification and CO₂ capture, SINTERCAP
Carlos A. Grande, Richard Blom, Kari Anne Andreassen, Ruth Stensrød
2. A large CLC reactor with high fuel conversion, BIGCLC
Øyvind Langørgen, Inge Saanum, Nils Erland L. Haugen
3. CO₂ capture from industry, Cement-case
Rahul Anantharaman, Karl Lindqvist, Simon Roussanaly, David Berstad, Actor Chikukwa, Thor Mejdell
4. CO₂ capture from industry, Offshore-case
Rahul Anantharaman, Morten Hammer, Karl Yngve Lervåg, Per Eilif Wahl, Thijs Peters, Wen Xing, Lars Nord, Actor Chikukwa, Thor Mejdell
5. Phase change solvent for CO₂ capture - achievements and challenges
Ugochukwu E. Aronu, Inna Kim, Xiaoguang Ma, Geir Haugen, Solrun J. Vevelstad, Andreas Grimstvedt
6. Boundary layer flashback in premixed hydrogen-air flames with acoustic excitation
Vera Hoferichter, Thomas Sattelmayer
7. Numerical analysis of a downscaled partial premixed bluff body low NO_x burner
Christoph Meraner, Mario Ditaranto, Terese Løvås
8. Fabrication and performance of asymmetric tubular H₂ membranes based on LWM-LSC composite
Zuoan Li, Marie-Laure Fontaine, Jonathan M. Polfus, Christelle Denonville, Wen Xing, Partow P. Henriksen, Rune Bredesen
9. Evaluation of a natural gas-fired CLC boiler for industrial steam generation
Vidar Skjervold, Rebecca Gullberg, Kristin Jordal, Øyvind Langørgen, David Berstad, Carl Schander, Adriana Reyes-Lúa
10. Influence of functionalized nanoparticles on CO₂/N₂ separation properties of gas separation membranes, HyMemCOPI
Gabriel Heredia, Thijs Peters, Christian Simon, May-Britt Hägg

CO₂ Transport

11. Fracture-propagation control in pipelines transporting CO₂-rich mixtures
Håkon O. Nordhagen, Svend T. Munkejord, Morten Hammer, Gaute Gruben, Marion Fourmeau, Stéphane Dumoulin

12. CO₂Mix – We are properly prepared
Sigurd W. Løvseth, H.G. Jacob Stang, Anders Austegard, Ingrid Snustad, Snorre F. Westman, Robin Wegge, Roland Span

CO₂ Storage

13. CO₂ thin-layer detection at the Sleipner Field with full waveform inversion
Anouar Romdhane, Etor Querendez, Espen B. Raknes
14. Constrained AVO for CO₂ storage monitoring at Sleipner
Bastien Dupuy, Verónica A. Torres C., Amir Ghaderi, Etor Querendez, Miłosz Mężyk
15. Quantification of uncertainty in geophysical monitoring methods
Peder Eliasson, Anouar Romdhane
16. CSEM detection limits and quantification of CO₂
Peder Eliasson, Zhijun Du, Joakim Nord
17. Appraisal of methodologies to determine the thickness of a thin CO₂ layer using 3D seismic data at Sleipner
Jim White, Gareth Williams, Andy Chadwick, Anne-Kari Furre, Anders Kiær
18. Leakage detection using time lapse seismic data
Jim White, Ben Marchant, Andy Chadwick, Gareth
19. CO₂ pressure and saturation discrimination using time-lapse seismic data
Jim White, Gareth Williams, Sissel Grude
20. Creep tests as a fracture healing mechanism
Pierre Cerasi, Claus Kjøller, Anna Stroisz, Erling Fjær
21. Fundamental exploration of cement to rock bonding
Anna Stroisz, Pierre Cerasi, Jørn Stenebråten
22. Stress history influence on fault reactivation
Rob Cuss, Andrew Wiseall, Jon Harrington, Caroline Graham, David Noy
23. Partial CO₂ saturation effects on sonic dispersion
Nicolaine Agofack
24. Seismic dispersion in shales. What can we learn from laboratory experiments at seismic and ultrasonic frequencies?
Dawid Szewczyk, Andreas Bauer, Rune M. Holt
25. New methods for quantifying well cement bonding
Kamila Gawel, Jelena Todorovic, Malin Torsæter, Sigurd Bakheim, Alexandre Lavrov
26. Electric field on casing for improving cement-steel bonding
Alexandre Lavrov, Kamila Gawel, Elvia Chavez, Malin Torsæter

27. Research-based recommendations for avoiding thermal cycling damage in wells
Peder Aursand, Morten Hammer, Alexandre Lavrov, Gaute Linga, Halvor Lund, Svend Tollak Munkejord, Malin Torsæter
28. Self-healing of cement defects upon CO₂ exposure
Elvia Chavez, Kamila Gawel, Dag Breiby, Peter Frykman, Claus Kjøller, Malin Torsæter
29. Optimizing cementing procedures in CO₂ wells
Alexandre Lavrov, Malin Torsæter
30. Pressure control for managing and optimizing adjacent subsurface operations in large scale CCS
Carsten M. Nielsen et. al.
31. Fault reactivation and geomechanical characterisation of the Bunter Sandstone
John D.O. Williams
32. Comparison of CO₂ EOR with alkali-surfactant-polymer injection EOR
Robert Drysdale

CO₂ Value Chain

33. Selection of optimal CO₂ capture plant capacity for better investment decisions
Rahul Anantharaman, Simon Roussanaly, Snore Westman, Jo Husebye
34. Cost-optimisation of membrane CO₂ capture
Amy Brunsvold, Simon Roussanaly, Rahul Anantharaman, Jana Jakobsen, Halvor Aarnes Krog
35. Benchmarking CO₂ transport technologies
Simon Roussanaly, Jana Jakobsen, Amy Brunsvold
36. The economic value of CO₂ for EOR applications
Simon Roussanaly, Alv-Arne Grimstad
37. A standardized approach to multi-criteria assessment of CO₂ chains
Jana Jakobsen, Simon Roussanaly, Mona Mølnvik