



10th CO₂GeoNet Open Forum

May 11-12, 2015

“CO₂ storage - the cornerstone of our low carbon future”

May 13, 2015

Joint CO₂GeoNet – EERA Research Workshop

What is needed for assuring CO₂ storage capacity?

European - North American Workshop supported by EERA

Sharing knowledge on demonstration of CO₂ capture technologies

CO₂GeoNet - a resource for Europe providing scientific support for the geological storage of CO₂

CO₂GeoNet - an Association of 26 members over 19 countries

The Forum - to make scientific research and researchers available to stakeholders

Venice, San Servolo Island, Italy



Organized by CO₂GeoNet in collaboration with:



Endorsed by:



AGENDA

Monday May 11

CO₂ storage – the cornerstone of our low carbon future Day 1: Creating a favourable environment for CCS

8:30 **Registration**

9:00 **Welcome**

Sergio Persoglia, CO₂GeoNet Secretary General

9:05 **Objectives of the 10th CO₂GeoNet Open Forum**

Ton Wildenborg, CO₂GeoNet President

Session 1: Can current policies drive CCS forward?

Chair: Isabelle Czernichowski-Lauriol, CO₂GeoNet - BRGM & Derek Taylor, GERC

9:15 **State of play of EC CCS policy and expectations of the Open Forum**

Vassilios Kougionas, European Commission

9:35 **US CCS policy, Regional Sequestration Partnerships, and major demonstration projects**

Thomas Sarkus, NETL – US DoE

9:55 **CCS enabling policy in the UK**

Tony Ripley, UK DECC

10:15 **The global status of CCS 2015 - A watershed year for CCS?**

Andrew Purvis, GCCSI

10:35 **Discussion time**

11:00 *Coffee break*

Session 2: What is needed to develop the CCS business case?

Chair: Ton Wildenborg, CO₂GeoNet - TNO & Ward Goldthorpe, The Crown Estate

11:30 **Reducing CCS costs: Learning curves, learning through Research & Development, and learning by doing**

Thomas Sarkus, NETL - US DoE

11:50 **The scale and development timeline of the European CO₂ storage industry**

Keith Whiriskey, Bellona

12:10 **Accelerating the intertwined transitions towards decarbonisation and efficient energy markets in the EU**

Christian Bos, CO₂GeoNet - TNO

12:30 *Lunch break*

14:00 **Creating a business case for CO₂ transport & storage**

Owain Tucker, ZEP - Shell

14:20 **Real Options: The key to unlocking CO₂ transport and storage infrastructure development**

Anna Korre, CO₂GeoNet - Imperial College

14:40 **Discussion time**

15:10 *Coffee break*

Session 3: What can R&D do to support implementation of CCS?

Chair: Axel Liebscher, CO₂GeoNet - GFZ & Sallie Greenberg, Illinois State Geological Survey

15:40 **Research highlights and future plans**

James Craig, IEA GHG

16:00 **MiReCOL: Developing corrective measures for CO₂ storage**

Filip Neele, CO₂GeoNet - TNO

16:20 **ULTimateCO₂: The underground rock laboratory experiment of Mont Terri**

Pascal Audigane, CO₂GeoNet - BRGM

16:40 **Discussion time**

17:10 **Closing remarks for Day 1**

From 18:00 **Welcome cocktail** *San Servolo Island - Room Basaglia*

CO₂ storage – the cornerstone of our low carbon future Day 2: Sharing knowledge from CO₂ storage pilot and demonstration projects

8:30 **Welcome and introduction**
Ceri Vincent, CO₂GeoNet - BGS

KEYNOTE LECTURE

8:35 **Why is CCS cost-effective for mitigating climate change?**
Claude Mandil, Former Executive Director of the International Energy Agency (IEA)

Session 4: Performance of storage pilots

Lessons learned throughout all stages (characterisation to post-injection monitoring) of pilot-scale CO₂ field projects in various geological media
Chair: Sabina Bigi, CO₂GeoNet - University of Rome & Derek Taylor, GERC

9:20 **Engineering design, construction, commissioning and starting the operation of the Hontomin pilot plant**
Carlos de Dios, CO₂GeoNet - Ciuden

9:40 **Safe and successful CO₂ injection operation and post-injection monitoring - Closing the life cycle of the Ketzin pilot site**
Axel Liebscher, CO₂GeoNet - GFZ

10:00 **Lacq and Rouse integrated CCS industrial pilot: A focus on the results and outlook of the storage issue**
Dominique Copin, TOTAL

10:20 **Discussion time**

10:40 *Coffee break*

Session 5: Performance of large-scale storage projects

Lessons learned from designing, operating demonstration and commercial-scale CO₂ field projects in various geological media
Chair: Roman Berenblyum, CO₂GeoNet - IRIS & Thomas Sarkus, NETL – US DoE

11:10 **Lessons learned from the Illinois Basin – Decatur Project: Integration of deep saline storage into the value chain**
Sallie Greenberg, Illinois State Geological Survey

11:30 **Statoil CO₂ storage experience: 20 years and 20 million tonnes**
Andrew Cavanagh, Statoil

12:00 **The Plains CO₂ Reduction Partnership: Demonstrating the geologic storage of carbon dioxide**
Charles Gorecki, EERC

12:20 **Incidental sequestration associated with CO₂ - EOR Permian Basin of Texas**
Ian Duncan, TBEG

12:40 Discussion time

13:00 Lunch break

Session 6: Monitoring and managing injection and storage activities
Integrated approaches to developing and implementing site-specific monitoring plans for CO₂ storage

Chair: Axel Liebscher, CO₂GeoNet - GFZ & James Craig, IEA GHG

14:20 Goldeneye MMV plan for the Peterhead CCS Project - Risk-based monitoring for a demonstration project

Marcella Dean, Shell

14:40 An adaptive management approach to CO₂ storage projects

Charles Gorecki, EERC

15:00 The CaMI CCS Field Research Station, Alberta, Canada

Richard Adamson, CMC Research Institutes

15:20 Discussion time

15:40 Coffee break

Session 7: Public outreach and participation

Lessons learned on the value of public engagement throughout all stages of a CO₂ storage project

Chair: Samuela Vercelli, CO₂GeoNet - University of Rome & Manfred Treber, Germanwatch

16:00 Public engagement is critical to the success of a CO₂ storage project

Chris Rathbun, Shell

16:20 A long-term approach to public participation at the Illinois Basin – Decatur Project

Sallie Greenberg, Illinois State Geological Survey

16:40 PCOR Partnership outreach – Over a decade of activity

Charles Gorecki, EERC

16:50 Discussion time

17:10 Closing remarks for Day 2

18:00 Departure by boat to the Concert and Gala Dinner

Joint EERA-CO₂GeoNet Workshop: What is needed for assuring CO₂ storage capacity?

8:00 **Registration**

8:30 **Welcome**

Ton Wildenborg, CO₂GeoNet - TNO

8:35 **Objectives**

Jonathan Pearce, EERA - BGS

Session 1: Injection strategies and injectivity

Chair: Jonathan Pearce, EERA - BGS & Ton Wildenborg, CO₂GeoNet - TNO

8:45 **Assessment of storage injection**

Gillian Pickup, HWU

9:05 **Injection strategies design and implementation in fractured carbonates**

Carlos de Dios, Ciuden

9:25 *Coffee break*

Session 2: Storage capacity and characterisation

Chair: Jonathan Pearce, EERA - BGS & Ton Wildenborg, CO₂GeoNet - TNO

10:00 **Developing a national portfolio of CO₂ storage in the UK – The UK CO₂Stored database and site portfolio**

Michelle Bentham, BGS

10:20 **France Nord case study**

Anne-Gaelle Bader, BRGM

10:40 **Providing assurance of storage capacity in open connected aquifers for multiple users: A case study from the Moray Firth - SiteChar & Multistore**

Max Akhurst, BGS

11:00 **The SiteChar site appraisal methodology**

Filip Neele, TNO

11:20 **Discussion time**

11:50 *Lunch break*

Session 3: BREAKOUT DISCUSSION

Identifying gaps in research and next steps to ensure storage capacity

Facilitators and rapporteurs: Jonathan Pearce, Ceri Vincent, Ton Wildenborg, Derek Taylor, Federica Donda, Max Akhurst

13:00 **Information on breakout sessions**

13:10 **Parallel breakout sessions**

14:10 *Coffee break (preparation for presentations)*

Session 4: PLENARY

Summary & discussion

Jonathan Pearce, EERA - BGS & Ton Wildenborg, CO₂GeoNet - TNO

14:40 **Presentations from breakout groups and discussion**

15:40 **Follow-up and closure**

Jonathan Pearce, EERA - BGS

15:50 **Adjourn**

Wednesday May 13

European – North American Workshop supported by EERA: Sharing knowledge on demonstration of CO₂ capture technologies

8:00 **Registration**

8:30 **Welcome**

Sergio Persoglia, CO₂GeoNet Secretary General

8:35 **Objectives**

Robert de Kler, EERA - TNO

Session 1: Small-scale testing of (next-generation) capture technologies

Chair: Chris Rathbun, Shell & Onno Tillema, ROAD

8:40 **Results of the CO₂ Capture Demonstration Facility at EDF's Le Havre Power Plant**

François Giger, EDF

9:00 **Testing an upscaling of the SER-technology: Enhanced methane reforming with integrated CO₂ capture**

Julien Meyer, IFE

9:20 **Discussion time**

9:40 *Coffee break*

Session 2: Capture technology pilots

Chair: Thomas Sarkus, NETL - US DoE & Earl Goetheer, TNO

10:10 **Lessons learned from large scale demonstration of pre-combustion technology in the power sector**

Robert de Kler, TNO

- 10:30 2015 Status update from the National Carbon Capture Center**
Frank Morton, Southern Company
- 10:50 Experience from TCM**
Olav Falk-Pedersen, Gassnova
- 11:10 Membrane post-combustion CO₂ capture at a coal-fired power plant**
Richard Baker, MTR
- 11:30 Pilot scale demonstration plants of an advanced aqueous amine-based post-combustion CO₂ capture utilizing BASF's OASE® blue technology**
Torsten Stoffregen, Linde

11:50 Lunch break

- 12:50 CO₂ compression for fossil fuel fired power plants**
Mark J. Kuzdzal, Dresser-Rand Company

- 13:10 Flameless pressurized oxy-coal - A large step for development with the Sulcis (Sardinia) large firing pilot and CO₂ geological storage initiative**
Massimo Malavasi, ITEA Spa

- 13:30 Oxyfuel capture in CFB boiler 30 MW - Challenges and lessons learned**
Carlos de Dios, Ciudad

13:50 Discussion time

14:20 Coffee break

Session 3: Large-scale demonstration of capture technology

Chair: Andrew Purvis, GCCSI & François Giger, EDF

- 14:40 Sharing experiences from the FEED phase of the Peterhead Project**
Chris Rathbun, Shell

- 15:00 Preparing for capture in the ROAD project**
Onno Tillema, ROAD

- 15:20 Update on the Kemper IGCC and Petra Nova Post-Combustion Capture Project**
Thomas Sarkus, NETL – US DoE

- 15:40 Follow-up and closure**
Robert de Kler, EERA - TNO

15:50 Adjourn

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Global CCS Institute



Italian national agency for new technologies,
energy and sustainable economic development



French national hub in the field of CO₂ capture,
transport, use and storage (CCUS)



Italian national institute of oceanography and
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San Servolo Island



CO₂GeoNet

The European Network of Excellence on the Geological Storage of CO₂

About CO₂GeoNet

CO₂GeoNet is the European scientific body on CO₂ geological storage. The Association currently comprises 26 research institutes from 19 European countries, and brings together over 300 researchers with the multidisciplinary expertise needed to address all aspects of CO₂ storage. With activities encompassing joint research, training, scientific advice, information and communication, CO₂GeoNet has a valuable and independent role to play in enabling the efficient and safe geological storage of CO₂. CO₂GeoNet was created in 2004 as a Network of Excellence supported by the EC FP6 programme for 5 years. In 2008, CO₂GeoNet became a non-profit association under French law. From 2013, the membership of CO₂GeoNet expanded thanks to the support of the now completed FP7 CGS Europe project. New Members continue to join CO₂GeoNet to further enhance the pan-European coverage and expertise of the Association.

More about CO₂GeoNet at www.co2geonet.com

CO₂GeoNet members

Austria: GBA - Geologische Bundesanstalt; **Belgium:** RBINS-GSB - Royal Belgian Institute of Natural Sciences; **Croatia:** UNIZG-RGNF - University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering; **Czech Republic:** CGS - Czech Geological Survey; **Denmark:** GEUS - Geological Survey of Denmark and Greenland; **Estonia:** TTUGI - Institute of Geology at Tallinn University of Technology; **France:** BRGM - Bureau de Recherches Géologiques et Minières; **Germany:** BGR - Bundesanstalt für Geowissenschaften und Rohstoffe; **Germany:** GFZ - German Research Centre for Geosciences / Deutsches GeoForschungsZentrum; **Hungary:** MFGI - Magyar Földtani és Geofizikai Intézet; **Italy:** OGS - National Institute of Oceanography and Experimental Geophysics; **Italy:** URS - Università di Roma "La Sapienza"; **The Netherlands:** TNO - Netherlands Organisation for Applied Scientific Research; **Norway:** IRIS - International Research Institute of Stavanger; **Norway:** NIVA - Norwegian Institute for Water Research; **Norway:** SPR - SINTEF Petroleum Research; **Poland:** PGI-NRI - Polish Geological Institute - National Research Institute; **Romania:** GeoEcoMar - National Institute of Marine Geology and Geoecology; **Slovenia:** GEO-INZ - Geoinženiring d.o.o.; **Spain:** CIUDEN - Fundación Ciudad de la Energía; **Spain:** IGME - Instituto Geológico y Minero de España; **Switzerland:** ETH - Swiss Federal Institute of Technology Zurich; **Turkey:** METU-PAL - Middle East Technical University Petroleum Research Center; **UK:** BGS - British Geological Survey; **UK:** HWU - Heriot-Watt University; **UK:** IMPERIAL - Dept. of Earth Science and Engineering, Imperial College London.