The Newsletter of the European Network of Excellence on the Geological Storage of CO_2

CO_2GeoNet Highlights

Issue No.10 March 2017

Driving CCS towards implementation

On 8 and 9 May 2017, the CO_2GeoNet Association will hold its 12th Annual Open Forum on San Servolo Island in Venice, Italy. Following the format of previous years, the Open Forum will be followed on 10 May 2017 by a number of focused scientific workshops, including one of the newly started Horizon 2020 project ENOS, an initiative of CO_2GeoNet. The Open Forum is recognised in the CCS community as one of the most prominent European CCS meetings on CO_2 geological storage, which offers the opportunity for knowledge exchange with international experts and stakeholders working at the leading edge of CCS. Participants will have the opportunity to discuss the latest progress on implementation of CCS and related research and development activities.

This year's central theme *"Driving CCS towards implementation"* takes up and continues the mission of the recent COP21, COP22 and GHGT-13 conferences. International researchers at these events reaffirmed the global task of mitigating climate change and highlighted the need to accelerate large-scale implementation of CCS together with other mitigation measures so that the maximum global temperature increase is kept well below 2°C.

The upcoming Venice Open Forum covers a wide spectrum of highly relevant topics, including European and international CCS policies and strategies, progress of running and emerging pilot and demonstration projects and their scientific achievements, and new CCS-related research supporting energy concepts for a low-carbon based economy. More information about the programme, the workshops and registration will follow soon on our website (www.co2geonet.com).

Cornelia Schmidt-Hattenberger, GFZ, Germany
Ton Wildenborg, TNO, The Netherlands

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Editorial

The importance of reducing geoscientific uncertainties

Geological storage of CO_2, an integral part of the CCS chain, has been demonstrated at industrial scale in many places around the world. The most recent review of the global status of CCS from GCCSI mentions more than 20 projects in operation or construction with a total annual volume of captured and stored CO_2 of about 40 Megatonnes. Costs have to reduce in order to accelerate CCS from the demonstration phase to full commercial scale with a volume of stored CO_2 that is two orders of magnitude higher. This will require more full-scale demonstration projects, in particular in Europe: the resulting learning will lead to a reduction of the costs.

The Cost of CCS is not only determined by investment and operational expenditure but also by the perceived cross-chain risks that are translated into risk premiums. The investment and operational costs for the storage component are relatively modest. In terms of risk premiums, the storage component can be significant. Here emerges the prominent role of geoscientists to further de-risk the storage component in defining bankable storage capacities, flexible injectivity and proofed containment. This will enable large-scale commercial CCS projects over the next decade.

The European Union is playing a crucial role in driving CCS forward in Europe by funding research and demonstration: one of the most recent EU funded examples is the Horizon 2020 project ENOS, a CO_2GeoNet Initiative, which will work on further reducing the risks and contribute to turning CCS into a commercial success.

Dear Reader, you are cordially invited to the next CO_2GeoNet Venice Open Forum to discuss the advances in CO_2 storage and the CCS chain with other stakeholders and scientists.

Ton Wildenborg, President CO_2GeoNet

CO_2GeoNet's participation at COP22

Negotiators from almost 200 countries met in Marrakech, Morocco, from 7–18 November 2016, for the 22nd Conference of the Parties (COP22) to the United Nations Framework Convention on Climate Change (UNFCCC). This was just days after the COP21 Paris Agreement came into force, which requires rapid actions to keep the global temperature rise this century well below 2 degrees Celsius compared to pre-industrial levels and to pursue efforts to limit it to 1.5 degrees Celsius. The aim of COP22 was to showcase progress and to start the important process of turning the Paris Agreement into a detailed blueprint for action. In terms of outcomes, the State Parties affirmed their commitment to the Paris Agreement and collectively agreed a timeline and modalities for its full implementation. The process, which will lead to detailed roadmaps, technologies, and financing to meet the declared INDCs (Intended Nationally Determined Contributions), should be completed by 2018 at COP24 in Poland, with a review of progress in 2017 at COP23 in Bonn, Germany.

As at COP21, CO_2GeoNet played a major role in raising the visibility of CO_2 geological storage during COP22. Through renewed ties with major CCS organisations such as the University of Texas, IEAGHG, GCCSI, French ClubCO_2, and CCSA, led* and (co-)organised** three side events, two in the negotiation blue zone and one in the green zone open to the public:

- 'CO_2 Capture and Storage is necessary for meeting the 2°C target'*
- 'Opportunities for Africa in Carbon Capture and Storage (CCS)'**
- 'Carbon dioxide Capture and Storage (CCS): what it's all about and why we need it'*.

CO_2GeoNet also organised and ran a booth for the full two-week period in the blue zone, which attracted much interest from delegates and observers. Experts were on-hand to answer questions and present the basic facts around the CCS technology in general, and why large-scale deployment is needed in order to meet the Paris Agreement targets.

To obtain more detailed information you are invited to

☞ Consult the posters and documentation displayed at the booth, as well as the presentations given at the side events, here: http://cop22.co2geonet.com

☞ Read the European Commission press release on the outcomes of COP22, including a link to the full text of the Marrakech Action Proclamation, here: http://europa.eu/rapid/press-release_IP-16-3841_en.htm

Rowena Stead, BRGM, France
Sergio Persoglia, CO_2GeoNet

We are looking forward to CO_2GeoNet activities at COP23 (6-17 November 2017, Bonn, Germany) and will again highlight the essential role of geological storage of CO_2 in climate mitigation measures.

Left: *His Majesty Mvondo Bruno from Clan Ndong, Cameroon meeting CO_2GeoNet staff Niels Poulsen and Ton Wildenborg together with Aicha El Khamlichi from ClubCO_2 and ADEME*

Below: *from left to right:* **Joseph Essandoh-Yeddu**, *Energy Commission, Ghana;* **Tony Surridge**, *South African National Energy Development Institute;* **Michael Monea**, *International CCS Knowledge Centre;* **Ton Wildenborg**, *CO_2GeoNet; and* **Katherine Duncker Romanak**, *University of Texas at Austin. (© IISD)*

CO_2GeoNet at the AGU Fall Meeting

The AGU Fall Meeting is the largest Earth and space science meeting in the world. Every year it hosts approximately 24,000 attendees and is traditionally held at the Moscone Convention Center, San Francisco, USA. The AGU Fall Meeting brings together the entire Earth and space science community from across the globe for discussions of emerging trends and the latest research. CO_2GeoNet organised and led the poster session *"Lessons learned from CO_2 Geological Storage research in Europe: natural laboratories, site characterisation, monitoring, modelling, and advances in understanding associated processes"*. The session was led by ExCo Member Sabina Bigi, with support from Ceri Vincent and Ton Wildenborg, respectively CO_2GeoNet ExCo Chair and President. The session was held on Tuesday, 13 December 2016, from 13:40 to 18:00.

Seven posters describing research experience on CO_2 storage in Europe were presented. The poster session was organised as a small tour across the presented posters and all the participants explained their research and results. One of the invited authors, Axel Liebscher (CO_2GeoNet-GFZ) presented the research activities and the main results from the Ketzin pilot project, one of the most important research projects in Europe on CCS.

Sabina Bigi, La Sapienza, Italy

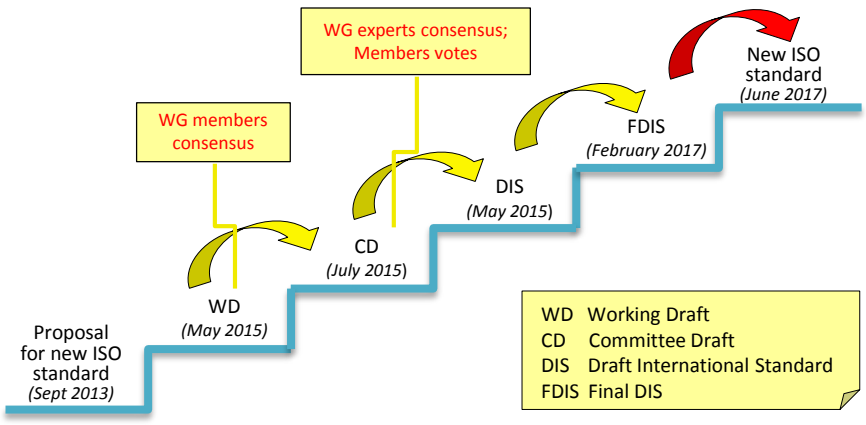
ISO TEC265 CCS - progress achieved in 2016-2017

The International Organization for Standardization (ISO) develops and publishes international standards to ensure that products and services are safe, reliable and of good quality. ISO has published standards on energy management, risk management, quality management and many other topics. In 2012, ISO established the committee TC265 CCS to oversee CCS standardisation with six Working Groups (WGs).

Most WGs are close to finalisation of the standards. The WG3 on geological storage has almost completed its Draft International Standard (DIS). Only minor refinements are required. It is expected that in March 2017 the document will reach the next phase of the process and a Final DIS (FDIS) will be submitted for approval. The FDIS should be approved by the ISO as a Standard in the summer of 2017.

The other WGs have made similar progress. ISO/TR 27912:2016 on CO_2 capture was published on the ISO website in May 2016, this Technical Report provides guidance for the development of an ISO document related to CO_2 capture as part of a CCS chain. Only the WG6 on Enhanced Oil Recovery (EOR) has not reached consensus yet. WG6 prepared the second Committee Draft ballot in January 2017. Following the results of the 2nd Committee Draft ballot, WG6 may submit a formal request to the Secretariat to extend their development timeline by nine months to produce the DIS and the FDIS.

Niels Poulsen, GEUS, Denmark



Process of developing the ISO Standards on CCS (modified after ISO TC265 WG3 2016)

CO_2GeoNet at GHGT-13 in Lausanne, Switzerland

On Monday, 14 November 2016, back-to-back with the 13th Conference on Greenhouse Gases (GHGT-13) in Lausanne, a seminar on cooperation between forerunner and follower countries in CCS research was hosted by the REPP CO_2 project. This project is an example of knowledge sharing with researchers from Norway and the Czech Republic working closely together. Representatives from these two countries and from several international CCS-related organisations contributed to the programme and the closing panel discussion. Ton Wildenborg, as President of CO_2GeoNet, gave a presentation and emphasized the role of the Association in knowledge transfer and capacity building. The overall key conclusion of the seminar was that continuous support at a national level is essential to realise the potential of this type of international cooperation.

The poster *"CO_2GeoNet perspective on CO_2 Capture and Storage: a vital technology for completing the climate change mitigation portfolio – The perspective from CO_2GeoNet, the European Network of Excellence on CO_2 geological storage"* was presented by Isabelle Czernichowski-Lauriol (CO_2GeoNet-BRGM) on behalf of the Association (Poster session B, 17 November 2016, 14:00 – 16:00).

Ton Wildenborg, TNO, The Netherlands

New CO_2GeoNet website

The new CO_2GeoNet website is on-line at www.co2geonet.com. Thanks to a long year collaboration with PromoScience srl, a web design company, the public area has been completely reorganised using a responsive design platform (dynamic lay-out and adaptive resolution for computers, tablets and smartphones).

More emphasis is given to *NEWS & HIGHLIGHTS* (on the home page and through the upper bar menu). On the *News and highlights* page, three sections are included:

- *News* (regarding current activities and initiatives of the Association)
- *In the media* (news on CCS published in newspapers and on-line)
- *From Members* (for activities of the Member Institutes)

In the *ABOUT US* section, information is provided regarding the Member Institutes, collaborative activities undertaken by the Association, Research Projects on CCS performed by the Members, and highlights the Association values, ambitions and four key areas of activity (Joint Research, Scientific Advice, Training and Capacity Building, Information and Communication).
The website also has links to the other websites developed for the CO_2GeoNet Open Forum 2015 and 2016 and for the Association activities at COP21 and COP22 (each site offers many topical and informative presentations, interviews, posters and other materials).
The *RESOURCES* page is used to disseminate material explaining the science supporting CCS and provide information on activities undertaken by the Association. The Brochure "What does CO_2 geological storage really mean?" available in 28 languages and all the CO_2GeoNet Newsletter issues are available as e-booklets and for download. The Key Reports developed in CGS Europe are also accessible on-line.
The *PUBLICATION* section gives access to the abstracts and bibliographic data of about 800 publications and presentations from researchers of the CO_2GeoNet Members. A search engine offers a "free-text" search for Author, Title and Abstract.

We strongly encourage readers to use the *CONTACT US* option to obtain more information and to get in touch about setting up future fruitful collaboration with the CO_2GeoNet Member Institutes.

Sergio Persoglia, CO_2GeoNet Secretary General

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