



10th Annual CO₂GeoNet Open Forum: CO₂ storage - The cornerstone of our low carbon future

On 11 and 12 May 2015, the CO₂GeoNet Association will hold its 10th Annual Open Forum in Venice, Italy. The Open Forum will be followed on 13th May 2015 by two parallel events on CO₂ capture and storage. The three-day event is organized in collaboration with the European Commission, US Department of Energy and EERA-CCS (European Energy Research Alliance-CCS) and endorsed by the IEA Greenhouse Gas R&D Programme, the Carbon Sequestration Leadership Forum and the Zero Emission Platform.

In 2015, important decisions are expected for large-scale storage demonstrations in Europe, in particular in the North Sea region. The first projects supported by the EC Horizon 2020 research funding will also start and results from the previous 7th Framework Programme will become available. The European Commission will also communicate the outcome from the recent evaluation of the CCS Directive and the European CCS

enabling policy framework. Globally, a new post-Kyoto agreement on GHG emission reduction, in which CO₂ storage will have a role to play is expected as a major outcome of the UNFCCC COP 21/ CMP 11 meeting that will be held in Paris in December 2015.

You are invited to hear the latest news on European and international CCS policies and strategies, the most recent developments in deploying CCS pilot and demonstration projects and participate in discussions with scientists and stakeholders in CCS.

2015 is a very important year for the future of CCS in Europe and worldwide. 2015 is also a very special year for CO₂GeoNet as it will be the 10th anniversary of the Open Forum, which we would like to celebrate with you.

For further information and to register for the Open Forum and workshops, please visit the website:

www.co2geonet.com/venice2015

*Ton Wildenborg, TNO,
The Netherlands*

11 May 2015 - Creating a favourable environment for CCS

Required actions for reshaping CCS policy in Europe and beyond and for creating a business case for CCS will be presented and discussed. You will hear about the status of large-scale demonstration of CO₂ storage and the latest results of European research projects.

12 May 2015 - Sharing knowledge from CO₂ storage demonstration and pilot projects

Sharing knowledge from storage demonstration projects and large storage pilots in North America and Europe. Presentation and discussion themes include best practices on operational performance of storage activities and public outreach.

13 May 2015 – Two parallel workshops on CO₂ capture and storage

1. Joint CO₂GeoNet – EERA Research Workshop:

What is needed for assuring CO₂ storage capacity?

2. European – North American Workshop:

Sharing knowledge on demonstration of CO₂ capture and transport.

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Agenda of the 10th Annual CO₂GeoNet Open Forum



Brief history of CO₂GeoNet, the European Network of Excellence on CO₂ geological storage

2004 - 2015: We have already come a long way in building a pan-European reference body with scientific expertise in geological storage of CO₂! Founded in 2004 as an EC FP6 project by 13 research institutes over 7 western European countries, all with a proven track record on CO₂ storage research, CO₂GeoNet became a non-profit Association in 2008. We are active on the EU and global scene to help enable efficient and safe CO₂ storage, through activities encompassing joint research, training, scientific advice, information and communication. CO₂GeoNet initiated and participated in the EC FP7 CGS Europe project (2010 - 2013), which resulted in major expansion of the Association's membership, breadth of expertise and geographical coverage to include eastern and southern Europe. By April 2015, CO₂GeoNet membership has reached 26 research institutes over 19 European countries. CO₂GeoNet is now a strong and independent Association heavily

engaged in enabling the underground storage of CO₂ captured at plants in the fossil-fuel energy, bioenergy and industrial sectors, as part of the global effort to keep average climate warming below 2°C. In 2015, CO₂GeoNet as an UNFCCC-accredited research NGO, will participate in the key events

around the COP-21 conference in Paris. CO₂GeoNet will continue to work towards a low carbon future with CO₂ storage implemented as a key global technology.

*Isabelle Czernichowski-Lauriol,
BRGM, France*

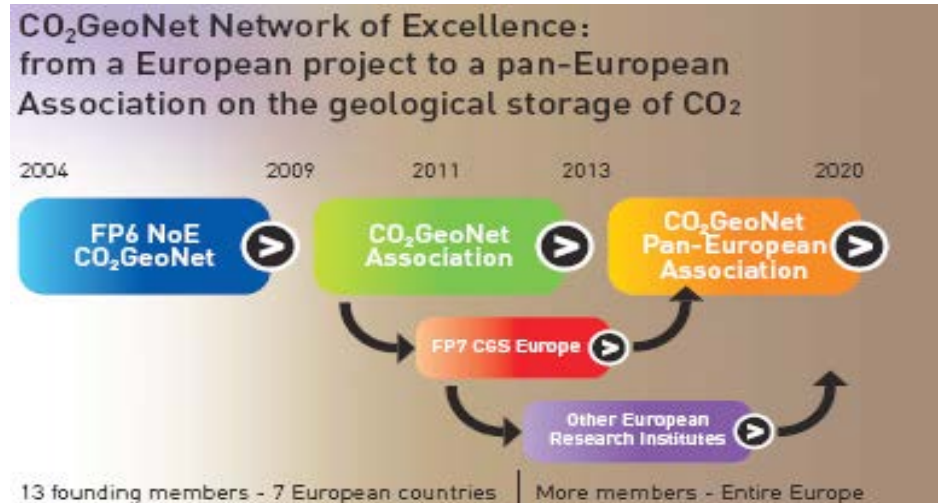
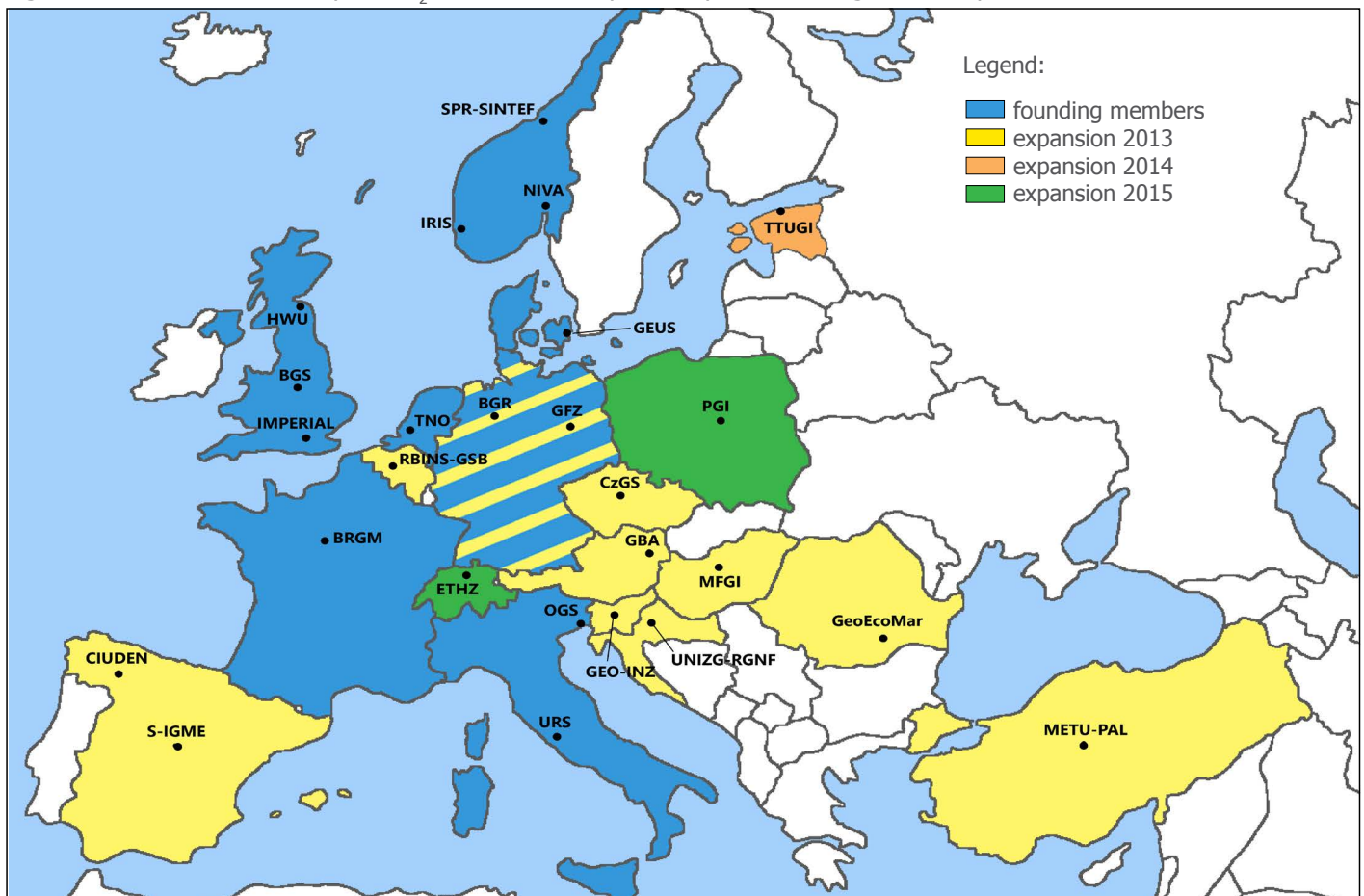


Figure 1: Timeline of CO₂GeoNet development

Figure 2: Current membership of CO₂GeoNet, with expansion phases throughout Europe



Progressing onshore CO₂ Storage in Europe: Hontomín Technology Development Plant, first steps in the operational phase

Hontomín Technology Development Plant (TDP) is owned by Ciuden and partially EEPR-funded through the OXYCFB300 Compostilla Project (www.compostillaproject.eu). The aim of this facility is to study the processes involved in the injection of CO₂ into a geological storage site, including the development of necessary technologies and methodologies that will advance storage of CO₂, making it more economically feasible at industrial scale.

The Hontomín pilot is located in Northern Spain, close to Burgos. The storage site is a carbonate reservoir which has a dome-like structure. Permeability results from the presence of fractures and this fracture network allows acceptable secondary permeability values under certain injection conditions. The site includes one injection well (H-I) and one monitoring well (H-A), both located at a depth close to 1580 m and both are fully instrumented. Further monitoring capacities at the site include a shallower hydrogeological monitoring network and surface tools, including 30 microseismic stations.

Site construction finished at the end of 2013, then the required hydraulic tests were performed in order to better define



Figure 1: Hontomín CO₂ storage pilot

the reservoir behavior, as well as testing the injection facilities (Figure 1) of the pilot project. Hydraulic tests included the design, execution and interpretation of a sequence of injection periods with brine and CO₂. By early 2015, up to 10,000 m³ of brine and 1,000 t CO₂ have been injected, leading to extensive knowledge on safe operation and representing the start of data acquisition from the operational phase.

Key lessons learned related to these first steps are the adaptation of CO₂ injection tests, based on flow rates and operational parameters acquired during the hydraulic tests, providing an accurate behavior of the reservoir, leading to a safe operation all along the CO₂ storage life cycle.

*Daniel Fernández Poulussen,
Ciuden, Spain*

How far CCS has come in Europe and the need to maintain momentum

Research into geological storage of CO₂ in Europe started in the 1990s, since then, CCS has grown into a recognised key component in mitigating greenhouse gas emissions. For example, the International Energy Agency climate scenarios (2013) identify CCS as an essential technology in limiting the average global temperature increase to 2°C.

In Europe, the Storage Directive provides policy support for CCS. The European Commission has reviewed the implementation of the Storage Directive and observed that the majority of Member States allow geological storage of CO₂, though with caveats in some cases. The consortium reviewing the Storage Directive concluded that the Directive was fit for purpose with only relatively minor revisions of guidance documents recommended, the EC will soon issue the outcome of their review.

After many years of research, a number of pilot projects in various phases of the

storage cycle exist in Europe and demonstration projects are moving towards Final Investment Decisions. The GCCSI (2014) report on the global status of CCS identified two projects in operation and six at the define/evaluate stage in Europe. Projects in operation are the Sleipner and Snøhvit CO₂ storage projects. Projects at the define/evaluate stage in Europe are the ROAD project in the Netherlands, and five projects in the UK: White Rose CCS project, Don Valley Power project, Peterhead CCS project, C.GEN North Killingholme Power project and the Captain Clean Energy project. Sharing the practical experience and site data from these projects is critical to moving the science of CCS forward.

The UK Department of Environment and Climate Change are supporting Front End Engineering Studies for two of the UK-based projects and the ROAD project has obtained a Storage Licence. These demonstration projects are moving forward,

but there is no guarantee that CO₂ will be stored until the final investment decisions have been taken. Large scale deployment of CCS in Europe seems to remain a future aspiration.

The pilot and demonstration projects offer important opportunities to communicate with the general public on the role of CCS in a low carbon future and the safety of geological storage of CO₂. There is also still a need for research to answer fundamental science questions raised during the demonstration phase and CCS features in the H2020 research programme as a clean energy technology, demonstrating the importance of understanding the science underpinning storage.

For the future of CCS, maintaining momentum is critical and ensuring that the science of CCS is communicated to all stakeholders is necessary to gain further support for this key mitigation technology.

See more: <http://www.sciencedirect.com/science/article/pii/S1876610214026617>

*Samuela Vercelli, URS, Italy;
Ceri J. Vincent, BGS, UK*



A scientific conference 'Our common future under climate change' will be held in Paris, 7-10 July 2015, upstream of the 21st UNFCCC Conference of the Parties (COP21) to be hosted by France in December 2015 ("Paris Climat 2015"). It will be a large forum for the scientific community with up to 1500 delegates expected. Building on the results of the IPCC 5th Assessment Report, key issues concerning climate change will be addressed in the broader context of global climate change. Solutions for both mitigation and adaptation issues will be discussed, through plenary sessions, parallel sessions, poster sessions and side events.

CO₂GeoNet is proud to announce its participation as co-convenor of a parallel

session under the theme '*Towards negative emissions*' on day 3 (9th July) dedicated to '*Responding to Climate Change Challenges*'. The session, entitled '**Negative emissions for climate change stabilization & the role of CO₂ geological storage**', will be run jointly with experts in removal of CO₂ from the atmosphere by human intervention, particularly through the production of sustainable bioenergy with CCS (BECCS). The pooling of these two important mitigation options offers a promising route for negative emissions. Following on from a keynote on the challenges of large-scale deployment of BECCS and other land-based mitigation options, CO₂GeoNet will give a keynote on the latest developments in CO₂ storage in Europe and globally, and

then focus on the latest science behind geological storage: how to assure sufficient and accessible CO₂ storage capacity prior to investment decisions for large-scale CCS projects and how to implement CO₂ storage in a manner that is safe for humans and the environment. Time will be reserved at the end of the session for open discussion with the audience.

Venue: UNESCO headquarters, Paris

Conference website:
<http://www.commonfuture-paris2015.org/>

Rowena Stead, BRGM, France



"CO₂GeoNet Highlights" is the online newsletter issued by The European Network of Excellence on the Geological Storage of CO₂ Association

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Online platform: www.co2geonet.com

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