



## Today's actions for zero emissions

The 14<sup>th</sup> CO<sub>2</sub>GeoNet Open Forum will be held on 7<sup>th</sup> and 8<sup>th</sup> May 2019 on San Servolo Island, Venice, Italy. This year's theme will be '*Act now for zero emissions - the role for CO<sub>2</sub> capture, utilisation and storage*'. The main event will be preceded and followed by focused scientific workshops on 6<sup>th</sup> May and 9<sup>th</sup> May.

CO<sub>2</sub> capture, utilisation and storage (CCUS) is a vital part of the "climate solution" and must not be neglected in overarching climate mitigation plans. To accelerate the deployment and application of the full CCUS value chain, strong focus should be placed on the storage component. Large scale industrial emitters need to recognize the necessity of storage solutions and be prepared to link with this component through the capture and transport aspects of the CCUS chain. In addition, pathways should be sought to achieve stronger public interaction and engagement with a view to seeking public support due to the benefits that can be realised through CCUS.

The Open Forum begins with an ice-breaker evening session on 6<sup>th</sup> May. The first day of the Open Forum opens with a keynote talk 'CO<sub>2</sub> storage - time to shift gear', followed by three sessions on 'Four years after the Paris agreement', 'Leading edge trends in CCUS' and 'Plug & Play storage - how close we are?'. The second day continues with another two sessions dedicated to 'Communication - putting people at the centre' and 'Integrating CCS'. There is ample opportunity for discussion during breakout sessions and for feedback during panel discussions.

Ahead of the Open Forum, on the 6<sup>th</sup> May, a workshop is being organised by the Carbon Sequestration Leadership Forum (CSLF) and CO<sub>2</sub>GeoNet to share experience from CO<sub>2</sub> storage projects - CO<sub>2</sub> storage stories: learning by doing. On the 9<sup>th</sup> May, following the Open Forum, a workshop organised by CO<sub>2</sub>GeoNet and the ENOS project "National networking - driving CCS forward" offers the opportunity for national CCS clubs to join together to drive CCUS



Participants from the 13<sup>th</sup> Open Forum (2018) near San Marco Square  
(photo courtesy R. Giorgi)

forward more effectively by sharing lessons learned and communication strategies. On the afternoon of May 9<sup>th</sup>, another joint workshop, organised by CLIMIT (Norway) and ARI entitled "Knowledge sharing - industrial CCS projects" will present the latest developments in establishing commercial scale storage projects through frontier research. Participants include the Northern Lights project. The Open Forum and workshops will provide the opportunity to acquire new

information on worldwide developments and to exchange knowledge about current national state of play of Member States within Europe and other continents. The aim is to share lessons learned in order to help close existing gaps between the CCUS chain components and to strive towards zero emissions.

Conny Schmidt-Hattenberger,  
GFZ, Germany

Ceri J. Vincent, BGS, UK

## Editorial

### A key role for industry in research projects



Many members of our Association were busy with preparing and submitting proposals for the second call in the ACT initiative on Accelerating CCS Technologies or are preparing for the next round of calls in H2020. ACT in principle straddles all Technology Readiness Levels with the largest financial contributions for the higher TRL levels. The ACT member countries are strongly recommended to involve industry in the proposals, which implies that these should target for high TRL levels. The 2018-2020 H2020 Work Programme puts emphasis on high TRL levels from 5 to 7, whereas Mission Innovation is focusing more on low TRL levels between 1 and 4. The 9<sup>th</sup> European Research Framework Programme Horizon Europe, which is now being developed, will be mission driven or in other words will be problem solving.

The mission driven approach will not only require an integral view on technology development along the TRL ladder but also a market which is ready for uptake of the new technologies. Good timing of technology development to meet the future market needs is key. Successful research, development and demonstration activities require early involvement of industry, in particular at TRL levels of six and higher where high cost investment in pilots and demos are needed. For CO<sub>2</sub>GeoNet this means that the interaction with industry has to be intensified in order to get viable research and innovation activities off the ground.

Ton Wildenberg,  
President CO<sub>2</sub>GeoNet 2015-2019

## CO<sub>2</sub>GeoNet participated at COP 24 in Katowice



CO<sub>2</sub>GeoNet participated in the environmental event of the year; the 24<sup>th</sup> Conference of the Parties (COP24) to the United Nations Framework Convention on Climate Change (UNFCCC) held from 3–14 December 2018 in Katowice, Poland. Actively participating in this event was one of the key activities of CO<sub>2</sub>GeoNet. As an officially recognised RINGO (Research and Independent Non-Governmental Organisation), CO<sub>2</sub>GeoNet played a major role in raising the visibility of CO<sub>2</sub> geological storage during the conference and renewed ties with organisations strongly involved in CCS globally. A joint press release was prepared with UK CCSA, EERA, GCCSI and ZEP that was launched during the first week of COP and sent to CO<sub>2</sub>GeoNet Members for distribution to negotiation delegates attending COP24 (<http://www.co2geonet.com/news-and-events/news/cop24-press-release/>).

CO<sub>2</sub>GeoNet was a lead organiser of a booth, two side events at the COP venue plus one external side event (please read the article on page 3). In addition, CO<sub>2</sub>GeoNet gave a presentation at the side event **CO<sub>2</sub> Capture project study: CCS in Nationally Determined Contributions and Mid-Century Strategies**, organised by the CO<sub>2</sub>Capture Project in the IETA Business hub. The CO<sub>2</sub> Capture Project, in partnership with ERM consultants, released a report earlier in 2018 that studied the role of CO<sub>2</sub> capture and geological storage in nationally determined contributions and the midcentury national strategies. Ceri J. Vincent (CO<sub>2</sub>GeoNet and BGS) gave the CO<sub>2</sub>GeoNet perspective on meeting climate targets with CO<sub>2</sub> storage and advancing CCS through knowledge sharing.

CO<sub>2</sub>GeoNet led a booth focused on **'We need CO<sub>2</sub> Capture & Storage (CCS) to meet the Paris Agreement targets'** together with co-organisers CCSA, TCCSUA, University of Texas at Austin and IEAGHG. The experts at the booth provided information on the science supporting CO<sub>2</sub> geological storage, a credible and flexible emission mitigation technology as well as showing examples of where CO<sub>2</sub> storage is already taking place and explaining the role for CO<sub>2</sub> storage in meeting climate targets. Rock samples, videos and brochures (downloadable in many languages) were available. All the visitors who expressed an interest in receiving further information have been contacted and added to the mailing list to receive CO<sub>2</sub>GeoNet news.

### Meet the expert session: CO<sub>2</sub>GeoNet on CO<sub>2</sub> storage /EU Pavilion lobby

CO<sub>2</sub>GeoNet was invited to take part in this sessions in the EC Pavilion lobby. This was an opportunity to have a 'mini-booth' for a couple of hours to talk to people who were interested to learn more about CO<sub>2</sub> storage.

On 12 and 13 December 2018 during the COP24 in Katowice, DG Climate Action organised a series of events around the EU Long-term strategy (LTS) for abating GHG emissions. DG Clima asked CO<sub>2</sub>GeoNet to organise an event on **Negative Emission Technologies (NETs)**. Our Association happily accepted this invitation and organised an event together with DG Clima, Bellona, EERA CCS and IEAGHG. The event entitled **'Demystifying negative emission technologies'** brought together international experts on Negative Emission Technologies. Almost 100 people

attended this event so the room was almost full. After a short introduction by Ton Wildenberg (CO<sub>2</sub>GeoNet and TNO), Artur Runge-Metzger from DG Climate set the scene by clarifying the importance of negative emissions to climate targets. Professor Jan Minx (Mercator Research Institute) then gave an overview of the various Negative Emission Technologies and their current status. Keith Whiriskey (Bellona) talked about sustainable biomass for negative emissions, land-based solutions were elucidated by Kelsley Perlman (FERN) and Prof. Krzysztof Sterenczak (LASZ) clarified the "Forest coal farms" project in Poland. Sallie Greenberg from the Illinois State Geological Survey (USA) presented the world-class example of BECCS via internet link. Direct air capture with CO<sub>2</sub> storage was demonstrated through a presentation on the Climeworks/Carbfix DACCS pilot project by Christoph Beuttler from Zürich University. In the last presentation, Ton Wildenberg showed that there is ample CO<sub>2</sub> storage space available for the CO<sub>2</sub> captured from the air. The presentations were followed by a lively debate led by Keith Whiriskey from Bellona.

The posters and materials displayed on the booth, as well as the presentations given at the CO<sub>2</sub>GeoNet (co)organised side events, can be accessed at <http://www.cop24.co2geonet.com/>

Niels E. Poulsen, GEUS, Denmark  
Ton Wildenberg, TNO, The Netherlands  
Ceri J. Vincent, BGS, UK

*Right: Exchanging information with international visitors at the CO<sub>2</sub>GeoNet led booth at COP24 (photo courtesy N. Poulsen)*

*Below: Ton Wildenberg welcomes attendees to the CO<sub>2</sub>GeoNet led event in the EU Pavilion at COP24 (photo courtesy P. Canteli)*





## CCUS locally and at European level – CO<sub>2</sub>GeoNet & GIG event



One of the key activities of CO<sub>2</sub>GeoNet was the event organised together with Główny Instytut Górnictwa (GIG). The joint event, held on 10 December, was titled “**CCUS locally and at European level**” and aimed to provide research institutions, universities, NGOs and stakeholders with an opportunity to share their work in the field of climate change and coal region transitions. The event also aimed to foster information exchange with local communities and stakeholders and cooperation with journalists and the press. The workshop was opened and the participants were welcomed by Jan Bondaruk, GIG, Deputy Director for Environmental Engineering, dr.inż. An outline of the event is given below.

**Coal region in transition, acting on climate change adaptation and mitigation.** The keynote talk was given by Aleksandra Tomczak, DG Energy, Policy Coordinator (EU Coal - Retail Electricity and Gas markets). The Strategy for long-term EU greenhouse gas emissions reductions underlines the importance of CCS to achieving the net-zero emissions goal in Europe. The Commission on Clean Energy for All Europeans will examine how to better support the transition in coal and carbon-intensive regions. To this end it will work in partnership with the actors of these regions, provide guidance, access to and use of available funds and programmes, and encourage exchange of good practices. Europe has 41 regions with coal mining activities across 12

Member States with 185,000 employed in coal mining. This transition will give a major economic opportunity for investments, growth and jobs, bringing concrete benefits to all Europeans: cleaner air, local economic development, better quality of jobs and improved living conditions.

Session 1 comprised talks from Ton Wildenborg (President of CO<sub>2</sub>GeoNet and Senior scientist, TNO) on **CCS is key to achieving our climate goals in time** and Tomasz Urych, Jarosław Chećko, Krzysztof Stanczyk, GIG on **CCUS in regions traditionally associated with coal mining and heavy industry**.

Session 2 comprised presentations on **EOR an important way towards CCS** by Roman Berenblyum (CO<sub>2</sub>GeoNet and NORCE). The economic application of CO<sub>2</sub> (EOR) in Poland is limited. Regulations implemented through transposition of the CCS Directive presently allow only offshore storage in Poland. Assessments and projects conducted in Poland have shown that geological settings are suitable for long-term storage of CO<sub>2</sub> and the Silesia region authorities strongly support all activity trying to find solutions for CO<sub>2</sub> capture and utilisation.

The session continued with **the ENOS project - Integration of CCS/CCUS with local activities** by Samuela Vercelli (CO<sub>2</sub>GeoNet and Sapienza University of Rome). Samuela highlighted that we need an ‘evolution from the so-called public acceptance’ to avoid social isolation where highly complex technological

developments are planned. Opportunities can be created by interacting in a ‘circular mode’ where equal consideration is given to all points of view. Dialogue and circular communication with the local communities on needs, fears, expectations and interests are needed. Humans need to connect to achieve higher goals looking at both collective and individual interests.

Paula Canteli (CO<sub>2</sub>GeoNet and IGME) presented **ENOS - Storytelling on CCS/CCUS by building a relationship between journalists and scientists**. Paula highlighted that communication with journalists and media should be considered as a natural part of our projects. We need to be proactive and explain the science in a simple manner to build mutual trust. We must be ready to answer questions! Scientists need journalists for dissemination. Journalists need scientists as a source of information. This relationship will be profitable for both parties.

The final presentation was given by Tim Dixon (IEAGHG) on **Implementing the Paris Agreement requires CCS. Examples of large-scale installations**. CCS supports a just transition to a low emission future and can bring significant value to national and global economies. CCS is a highly versatile technology that can be adapted to best fit the local conditions and meet the needs of the local economy and society.

More information at <http://www.cop24.co2geonet.com/>

Niels E. Poulsen, GEUS, Denmark  
Aleksandra Koteras, GIG, Poland



*Discussion panel at the event organised at GIG. The presentations provided two interesting panel discussion sessions (photo courtesy N. Poulsen)*

## CO<sub>2</sub>GeoNet presented at an international CCUS roundtable

CO<sub>2</sub>GeoNet presented at an [international CCUS roundtable](#) on recent knowledge sharing activities carried out by the Association (see CO<sub>2</sub>GeoNet News for slides). The roundtable was entitled "strengthening international collaboration on carbon capture use and storage" and took place from 13 - 14 February 2019 in Washington, D.C. The event was co-hosted by the Center for Climate and Energy Solutions (C2ES) and the Research Institute

of innovative Technology for the Earth (RITE). The focus of the workshop was to prepare messages on the role for CCUS in meeting climate targets ahead of the G20 conference which will be hosted by Japan later this year.

The CO<sub>2</sub>GeoNet presentation explained the role of CO<sub>2</sub>GeoNet and stakeholder engagement activities through research (e.g. the ENOS site twinning programme), scientific advice and support offered to international institutes and the European Commission (e.g. the CO<sub>2</sub>GeoNet position paper on funding pilot projects through H2020) and highlighted a few of the many communication activities that CO<sub>2</sub>GeoNet undertakes to reach a wider audience (e.g. the Open Forum and the

booth and side events at COP24). The event co-organisers have published [recommendations](#) and a [background paper](#) from the roundtable. Recommendations offered for consideration at the G20 ministerial include highlighting the importance and benefits of CCUS and integrating CCUS into Action Plans. Recommendations to strengthen international collaboration such as engaging financial institutions, encouraging public and private investment and organising side events at G20 were also highlighted in the Recommendations paper.

*Ceri J. Vincent,  
CO<sub>2</sub>GeoNet President  
BGS, UK*

## CO<sub>2</sub>GeoNet is expanding Presentation of new member institutes (6<sup>th</sup> round of applications)



G I G

**Główny Instytut Górnictwa,  
Central Mining Institute  
(GIG)**

The Central Mining Institute (GIG), established in 1925, is one of the largest research institutes in Poland, working for the benefit of the mining industry and also to support enterprises of different branches of state and local administration and foreign partners. GIG's activities are mainly focused on mining and environmental engineering, occupational safety, material engineering, education and training. As one of the very first European scientific organisations GIG became involved in CCS-related projects i.e. RECOPOL project and later into MOVECBM, CO<sub>2</sub>REMOVE, ECCSEL, TOPS and many other CCS-related actions. GIG is actively involved in all aspects of the CCS/CCU chain i.e.: Capture – Transport – Storage – Use, as well as providing expertise on risk assessment and public perceptions of CCS/CCU. GIG has a unique combination of highly qualified scientists, modern laboratories and equipment, making it one of the well-known R&D units with more than 90 years' worth of international expertise and scientific excellence.



Instituto de Ciências da Terra

**Instituto de Ciências  
da Terra (ICT)**

The Institute of Earth Sciences (ICT) is a research center hosted by three Portuguese universities: University of Évora, University of Minho and University of Porto. ICT currently has 78 researchers (PhD) organized in six groups: Atmospheric Sciences, Water and Climate; Georesources and Geomaterials; Geoconservation and Geoscience Education; Environmental Monitoring and Remediation for Sustainability; and Lithosphere Dynamics.

Research on CCUS started at ICT in 2008 and resulted in the storage capacity assessment and definition of transport options for Portugal, within the scope of projects KTEJO and COMET. ICT was a partner in developing the CCS Roadmap for Portugal and has been actively promoting the technology amongst the members of the Community of Portuguese Language Countries. Currently ICT is involved in the INCARBON project and in the STRATEGY CCUS Coordination and Support Action.



"CO<sub>2</sub>GeoNet Highlights" is the online newsletter issued by The European Network of Excellence on the Geological Storage of CO<sub>2</sub> Association

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Online platform: [www.co2geonet.com](http://www.co2geonet.com)

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