



## Update on CO<sub>2</sub>GeoNet and CGS Europe Projects

Dr. Isabelle Czernichowski-Lauriol

CO<sub>2</sub>GeoNet President Emeritus & CGS Europe Coordinator

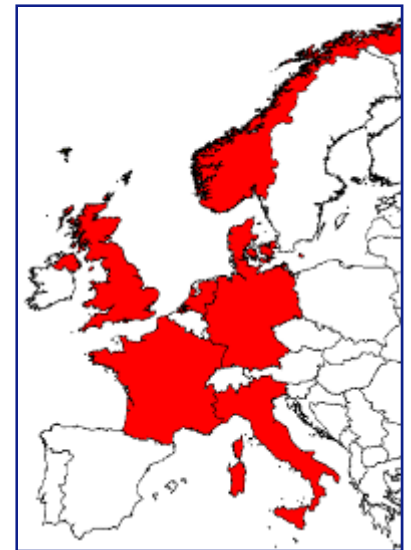
BRGM, French Geological Survey



# CO<sub>2</sub>GeoNet adventure started in 2004

- ✓ Created as a EU **FP6 Network of Excellence**
  - Project duration: 5 years (April 2004 – March 2009)
  - Budget: 9 M€ ; EU contribution: 6 M€
  - Coordinator: BGS, Nick Riley
- ✓ Became an **Association** under French law in 2008 (a major due deliverable of the European contract)

Founding members :  
13 research institutes  
over 7 countries



Denmark: **GEUS**  
France: **BRGM, IFP**  
Germany: **BGR**  
Italy: **OGS, URS**  
Netherlands: **TNO**  
Norway: **NIVA, RF, SPR**  
UK: **BGS, HWU, IMPERIAL**



# CO<sub>2</sub>GeoNet Activities



1. Joint research
2. Scientific advice
3. Training
4. Information and communication

*As an **independent and multidisciplinary scientific body**, CO<sub>2</sub>GeoNet has the key role of building trust on CO<sub>2</sub> geological storage and supporting wide-scale CCS implementation*

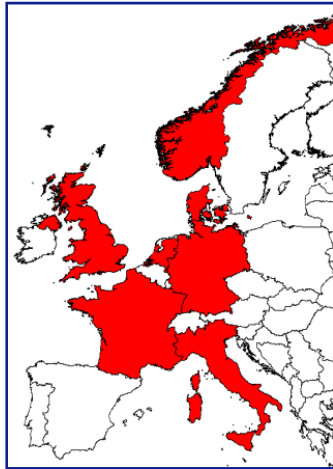
## International recognition:

- CSLF recognised project
- MoU with IEAGHG



# Need for more trans-national cooperation and networking

From CO<sub>2</sub>GeoNet project ...



**7 Countries, 13 Research Institutes**

...to CGS Europe project



**28 Countries, 34 Research Institutes**

Pooling European scientific expertise on CO<sub>2</sub> geological storage continued through collaboration with key institutes from:

- *CO2NET EAST – FP6 Coordination Action on CCS (2006-2010)*
- *ENeRG - European Network for Research in Geo-Energy*
- *EuroGeoSurveys – Association of the European Geological Surveys*



# CGS Europe - Pan-European coordination action on CO<sub>2</sub> Geological Storage



**Project duration:** 3 years (Nov. 2010 – Oct. 2013)

**Budget:** 2,9 M€; EU contribution: 2,2 M€

**24 Partners** (including the CO<sub>2</sub>GeoNet Association), representing **34 research institutes** over **28 countries**

**Coordinator:** BRGM – Isabelle Czernichowski-Lauriol

Also a CSLF recognized project



**Objectives:** To build a credible, independent and representative pan-European scientific body of expertise on CO<sub>2</sub> storage that will:

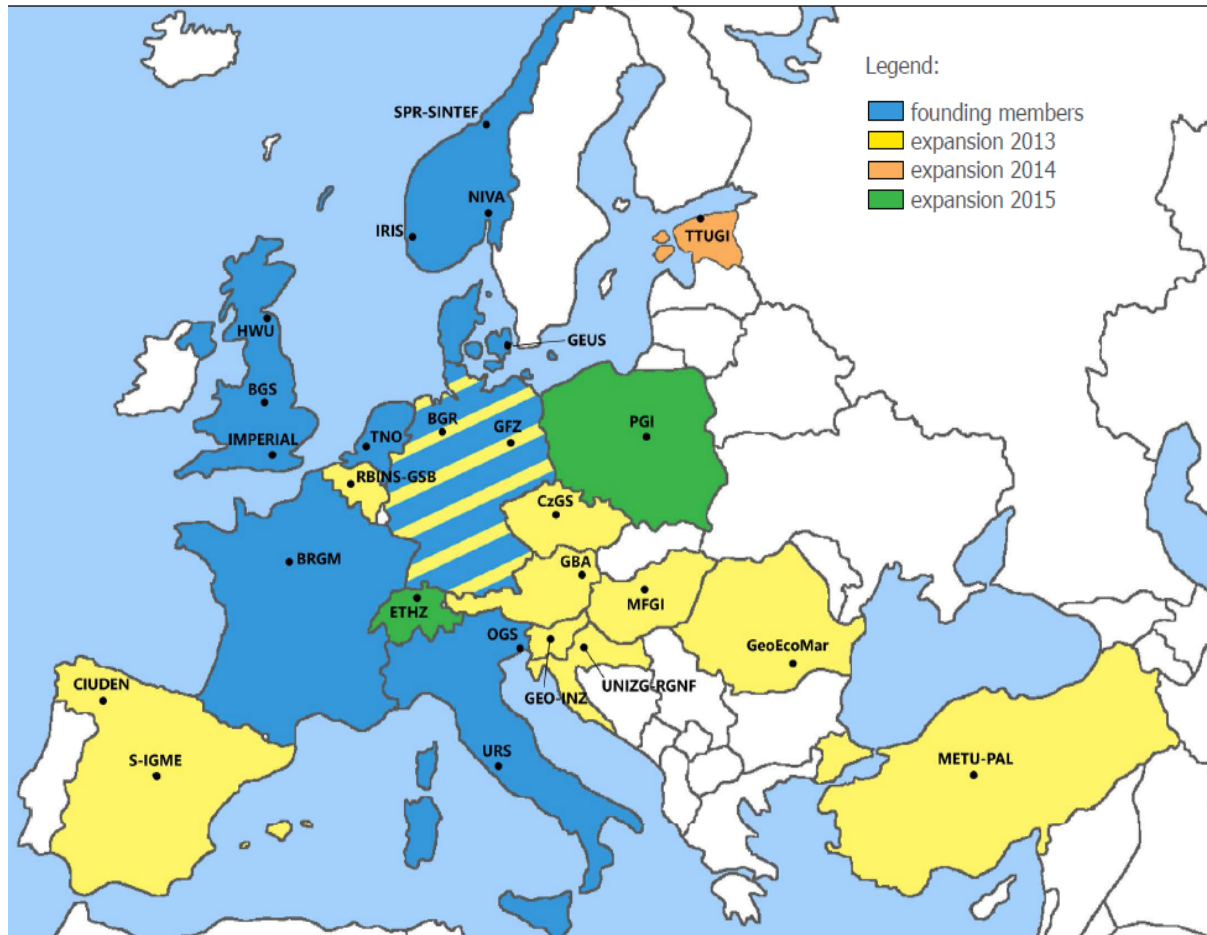
- ✓ instigate a durable networking of research capacity on CO<sub>2</sub> storage in Europe
- ✓ liaise and coordinate its activities with other stakeholders, including ZEP
- ✓ help reduce the existing gap between the 'forerunner' countries, and the 'follower' countries
- ✓ contribute to the large-scale demonstration and industrial deployment of CCS
- ✓ support the implementation of the EU Directive on the geological storage of CO<sub>2</sub> and other regulatory regimes



# A leap forward for the CO<sub>2</sub>GeoNet association

From 2013, thanks to the support of the **CGS Europe project**:

- ✓ 11 CGS Europe partners out of 21 not yet members (52%) joined
- ✓ GFZ (Germany), CIUDEN (Spain), ETH Zurich (Switzerland) also joined



✓ **Membership in 2015:**  
26 research institutes across 19 countries

✓ **Increased International Collaboration**



# Cooperation with international bodies

- ✓ **CSLF** – CO<sub>2</sub>GeoNet is a CSLF recognized project since the FP6 project
- ✓ **IEAGHG** - CO<sub>2</sub>GeoNet and IEAGHG signed a MoU in 2008
- ✓ **GCCSI** - CO<sub>2</sub>GeoNet is a Member of GCCSI since 2013, then an Associate
- ✓ **UNFCCC** - CO<sub>2</sub>GeoNet is an Observer organisation (Research NGO) of UNFCCC since 2013 - participated / will participate to:
  - COP-19 in Warsaw in December 2013
  - COP-21 in Paris in December 2015
- ✓ **ISO CCS** - CO<sub>2</sub>GeoNet is a Category A Liaison to ISO TC265 since early 2014



# Joint Research Activities

**FP7 RISCS project** on ecosystems impacts (2010-2013)

**DG Energy - CO2Stop project** for mapping CO<sub>2</sub> storage potential in Europe

## **IEAGHG studies:**

- ✓ Potential **Impacts on Groundwater** Resources of CO<sub>2</sub> Storage (IEAGHG report 2011-11)
- ✓ Quantification Techniques for **CO<sub>2</sub> Leakage** (IEAGHG report 2012-02)
- ✓ Methodologies and Technologies for **Mitigation** of undesired CO<sub>2</sub> migration in the subsurface (IEAGHG report 2013-20)

## **CGS Europe reports:**

- ✓ **State-of-play on CO<sub>2</sub> storage in the 28 European countries** (May 2013)
- ✓ Opportunities for **CO<sub>2</sub> storage pilots** across Europe (October 2013)
- ✓ State-of-the-art of **Monitoring** methods to evaluate CO<sub>2</sub> storage site performance (April 2013)
- ✓ State-of-the-art review of CO<sub>2</sub> storage **site selection and characterisation** methods (September 2013)
- ✓ State-of-the-art review of **directives and regulatory regimes** related to operational and safety risks of CO<sub>2</sub> storage (February 2014)

**ENOS proposal** 'Enabling Onshore CO<sub>2</sub> storage in Europe' submitted to H2020 LCE call: reserve list due to budgetary constraints





# Scientific Advice Activities

**DG Clima:** 'Framework contract in relation to climate change' (4-year contract led by ICF Consulting Ltd (2012-2015))

- ✓ Periodic Service Requests on CCS Directive and NER300
- ✓ CO<sub>2</sub>GeoNet/CGS Europe involved in the contract "Implementation of Directive 2009/31/EC on the geological storage of CO<sub>2</sub>(**CCS Directive**)– support to the implementation report" in 2013

## **European Commission:**

- ✓ Response in 2013 to the Consultative Communication on the future of CCS in Europe
- ✓ Input to the review of the Storage Directive in 2014 (online questionnaire, participation to two stakeholder meetings)

## **European Parliament:**

- ✓ Multiple inputs to MEP Chris Davies request for advice on CCS (documents, participation to roundtables and workshops at the EU Parliament) in 2013

## **United Nations Economic Community (UNECE):**

- ✓ Recommendations on CCS in 2014

**ISO TC265 on CCS:** review of documents on CO<sub>2</sub> storage in 2015



# Training and Capacity Building Activities

- ✓ IEAGHG Summer schools on CCS: contribution of CO<sub>2</sub>GeoNet
- ✓ CCOP Training course on CO<sub>2</sub> storage, Bangkok, Thailand, 2009
- ✓ ESF Research Conference “CO<sub>2</sub> Geological Storage: Latest progress”, Obergurgl, Austria, 2009
- ✓ OPEC – IEA GHG Summer school on CCS, Algeria, 2009
- ✓ EAGE Student Lecture Tour on CO<sub>2</sub> storage - 45 universities around Europe in 2010-2011
- ✓ CGS Europe Spring school on CO<sub>2</sub> storage: Poland (2012), Romania (2013)
- ✓ Sulcis CCS International Summer School in 2015



1st CGS Europe  
Spring School,  
Poland, 2012

# Information & Communication Activities



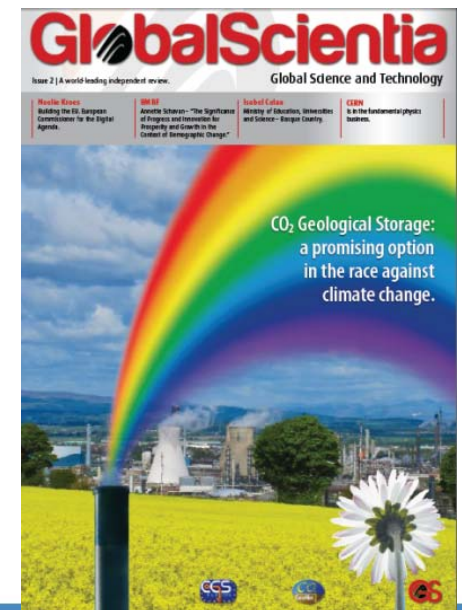
Workshop in Berlin, 2013 - 'Pinning hopes for climate protection on CO<sub>2</sub> storage ? Perspectives of a bridging technology'



Booth at SciTechEurope event in Brussels, 2011



Workshop with scientific journalists of EUSJA, Venice, 2013



# CO<sub>2</sub>GeoNet Brochure “What does CO<sub>2</sub> geological storage really mean ?” translated in 26 languages

CO <sub>2</sub> 'nin yeraltı	Mitä	Что в самом означает	ماذا يعنى التخزين الجيوولوجي لـ CO <sub>2</sub>
Arabic ؟ CO2 الجيولوجي التخزين حقا يعنى ماذا	Russian "Что в самом деле означает геологическое хранение CO2?"	Finnish "Mitä hiilidioksidin (CO2) geologinen varastointi tarkoittaa?"	Turkish "CO2'nin yeraltı katmanlarında depolanması gerçekte ne anlama geliyor?"
Bulgarian "Какво означава в действителност геоложкото съхранение на CO2?"	Croatian "Što zapravo znači geološko skladištenje CO2?"	Czech "Co to vlastně je geologické ukládání CO2?"	Danish "Hvad betyder geologisk lagring af CO2 egentlig?"
Dutch "Wat betekent ondergrondse CO2-opslag nu eigenlijk?"	English "What does CO2 geological storage really mean?"	Estonian "Mida CO2 geoloogiline ladustamine tegelikult tähendab?"	French "Que signifie vraiment le stockage géologique du CO2 ?"
German "Geologische CO2 - Speicherung - was ist das eigentlich?"	Hungarian "Mit jelent valójában a CO2 geológiai tárolása?"	Italian "Che cosa significa veramente lo stoccaggio geologico della CO2?"	Latvian "Ko īstenībā nozīmē CO2 uzglabāšana zemes dzīlēs?"
Lithuanian "Ką reiškia geologinis CO2 saugojimas?"	Norwegian "Hva betyr geologisk lagring av CO2 egentlig?"	Polish "Podziemne składowanie CO2 – czym jest tak naprawdę?"	Portuguese "O que significa realmente armazenamento geológico de CO2?"
Romanian "Ce înseamnă, de fapt, stocarea geologica a CO2?"	Serbian "Šta zaista znači geološko skladištenje CO2?"	Slovakian "Čo skutočne znamená geologické ukládanie CO2?"	Slovenian "Kaj geološko skladiščenje CO2 pravzaprav pomeni ?"
Spanish "¿Qué significa el Almacenamiento Geológico de CO2?"	Swedish "Vad innebär egentligen geologisk lagring av koldioxid?"		

# CO<sub>2</sub>GeoNet Newsletter

Issue N°1 – Dec 2013

Issue N°5 – June 2015



The Newsletter of the European Network of Excellence on the Geological Storage of CO<sub>2</sub>

## CO<sub>2</sub>GeoNet Highlights

Issue No.1

December 2013



The Newsletter of the European Network of Excellence on the Geological Storage of CO<sub>2</sub>

## CO<sub>2</sub>GeoNet Highlights

Issue No.5

June 2015

### A leap forward for the CO<sub>2</sub>GeoNet Association

Through the last seven months of the CGS Europe project, the CO<sub>2</sub>GeoNet Association underwent two phases of expansion where new partners from the CGS Europe project joined, so that the collaborative links established through the CGS Europe project can continue under the Association. GFZ and CIUDEN also joined CO<sub>2</sub>GeoNet bringing access to their pilots at Ketzin and Hontmin. This expansion is another step forward for the Network of Excellence, broadening the geographical coverage to pan-European and drawing together more key researchers on CO<sub>2</sub> geological storage. CO<sub>2</sub>GeoNet now comprises 24 key research institutes from 16 countries.

The strength of CO<sub>2</sub>GeoNet is greatly increased by this expansion, and its four main domains of activity: research, training, scientific advice, information and communication will benefit. As an example, the brochure 'What does CO<sub>2</sub> geological storage really mean?' has been translated into all the languages of the CGS Europe project (brochure now available in 25 languages through [www.co2geonet.com](http://www.co2geonet.com)). In line with its strategy, CO<sub>2</sub>GeoNet, as an independent scientific body, will continue to interact with stakeholders to enable the efficient and safe geological storage of CO<sub>2</sub> as a key technology in mitigating climate change.



CO<sub>2</sub>GeoNet recently expanded: new member countries (in yellow) have joined the founding member countries (in orange)

Isabelle Czernichowski-Laurito  
BRGM, France  
Carl J. Vincent, BGS, UK

#### In this issue:

- A leap forward for the CO<sub>2</sub>GeoNet Association
- CO<sub>2</sub>GeoNet school on CO<sub>2</sub> geological storage
- Completion of the CGS Europe project
- News and events
- Presentation of new members of the Association (1<sup>st</sup> round of applications)

#### Seeking sponsors for the next CO<sub>2</sub>GeoNet school on CO<sub>2</sub> geological storage

Following three successful courses on CO<sub>2</sub> geological storage (CGS) over the last three years (see [www.cgs-europe.net](http://www.cgs-europe.net) - publications-public project deliverables D5.12, D5.13), CO<sub>2</sub>GeoNet is aiming to run the popular CO<sub>2</sub>GeoNet school in 2014.



The purpose of the CO<sub>2</sub>GeoNet school is to share the knowledge that already exists in Europe on geological storage of CO<sub>2</sub>. The school will last for one full week and will target young scientists and postgraduate students. Through lectures and practical exercises, the 20 – 25 students will develop understanding of climate change, CO<sub>2</sub> geological storage and monitoring and regulatory requirements.

CO<sub>2</sub>GeoNet is seeking sponsors to support costs for teaching and facilities. We hope that you will be able to help with a sponsorship. Please contact Niels Poulsen at [geo@geonet.eu](mailto:geo@geonet.eu).

Niels E. Poulsen, GEUS, Denmark



### New leadership for the CO<sub>2</sub>GeoNet Association

Since its foundation in 2004, CO<sub>2</sub>GeoNet has been successfully guided by Isabelle Czernichowski-Laurito, BRGM. During the elections in March 2015, leadership of the Association was entrusted to Ton Wildenberg, TNO. Here are some thoughts from the past and the new Presidents.



It has been my pleasure to participate in the founding team of CO<sub>2</sub>GeoNet - together with Nick Riley, Sergio Pasquella, Niels Færev Christensen and Ipo Ritsma, and to take an active role in its development as Network Manager under the FP6 contract, then as Chair of the Executive Committee when the Association was created in 2008 and finally as President from 2011.

CO<sub>2</sub>GeoNet is now a strong, independent, pan-European Association, which represents the scientific voice of Europe on CO<sub>2</sub> geological storage that interacts with many stakeholders in Europe and globally to develop this key climate change mitigation technology. This has been possible thanks to the involvement of each CO<sub>2</sub>GeoNet Member and researcher and to the huge collective effort, in which everyone had an important role to play. After 11 years of heavy involvement in the management of CO<sub>2</sub>GeoNet, I thought it was time to pass the baton and I am very pleased that Ton Wildenberg was elected as the new President. I will continue to be involved in CO<sub>2</sub>GeoNet activities, especially since I had the great surprise and honour during the gala evening of the Venice Open Forum to be appointed President Emeritus!

Isabelle Czernichowski-Laurito, BRGM, France

I feel privileged to be elected as president of the CO<sub>2</sub>GeoNet Association and succeed Isabelle; she left a strong Association with a high level of ambition. I wish to thank Isabelle for all her efforts that enabled CO<sub>2</sub>GeoNet to prosper. The Association has arrived in exciting times where we face many challenges in positioning geological CO<sub>2</sub> storage as a reliable and substantial climate mitigation measure. Expectations are growing for the outcomes of the next COP/CMIP meeting in Paris, December 2015. Large cuts in emissions, as we know, imply large-scale deployment of CCS since a substantial part of our energy is expected to still come from fossil fuels even when we are halfway through this century. CO<sub>2</sub>GeoNet is keen to profile CO<sub>2</sub> storage and CCS as a safe and effective emission reduction measure at the pre-COP scientific conference in Paris from 7<sup>th</sup> to 10<sup>th</sup> July 2015 and at side events including those being co-organised by the Association in the UK and Italy.



Next to CO<sub>2</sub>GeoNet's activities to inform and engage stakeholders, offer scientific advice, provide training and perform research, the Association will invest in the social fabric of its network of 26 Members from 19 different European countries.

Ton Wildenberg, TNO, The Netherlands

#### International Sulcis Summer School on CCS Technologies 2015

The third edition of the International Sulcis Summer School on CCS Technologies will be held in Carbonia (Cagliari, Sardinia), at the Sotacarbo Research Centre, from the 13<sup>th</sup> to the 17<sup>th</sup> of July. The Summer school is organized by ENEC, The University of Cagliari (Department of Mechanical, Chemical and Materials Engineering), Sotacarbo, IEA CCC and CO<sub>2</sub>GeoNet. It responds to the increasing interest worldwide for the technologies of separation and confinement of carbon dioxide (CCS-“CO<sub>2</sub> Capture and Storage”). The school is open to 40 MSc/MA or PhD students from around the world who have an engineering, geo-technological or socio-economic

background. The lecture program will cover the range of techniques developed for the capture, transport and geological storage of CO<sub>2</sub>. The Sulcis basin can be considered this ideal natural laboratory for experimentation of these technologies, thanks to the presence of deep layers of coal (suitable for the permanent storage of CO<sub>2</sub> due to its particular geological features) and also of an aquifer underneath the coal basin that offers additional storage potential.

Read more at: <http://www.sulcisocssummerschool.it/en>

Sabina Bigl, La Sapienza, Italy  
Santuzia Veroni, La Sapienza, Italy

#### In this issue:

- New leadership for the CO<sub>2</sub>GeoNet Association
- International Sulcis Summer School on CCS Technologies 2015
- The outcome of the Open Forum for CO<sub>2</sub> storage as the cornerstone of our low carbon future
- CCS clusters to speed European deployment
- CO<sub>2</sub>GeoNet parallel session and side events supporting pre-COP conference in Paris



# CO<sub>2</sub>GeoNet and the pre-COP21 scientific conference 'Our common future under climate change'

Paris, France, 7-10 July 2015

OUR UNDER  
COMMON CLIMATE  
FUTURE CHANGE

- Co-organiser of **Parallel session**: *Negative emissions for climate change stabilization & the role of CO<sub>2</sub> geological storage* (Paris, 9<sup>th</sup> July)
- Co-organiser of Side events:
  - **Italy**: *A dialogue for developing synergies for sustainable energy production: how can biomass, hydrogen and CCS work together to mitigate climate change?* (20<sup>th</sup> June)
  - **UK**: *What geological CO<sub>2</sub> storage can bring to mitigating climate change - UK research perspective* (1<sup>st</sup> July)
  - **France**: *Sharing visions of a low carbon society* (5<sup>th</sup> July)
  - **Italy**: *The potential contribution of CO<sub>2</sub> geological storage to climate change mitigation, both globally and in Italy* (13<sup>th</sup> July)



# CO<sub>2</sub>GeoNet and the pre-COP21 scientific conference 'Our common future under climate change'

Paris, 7-10 July 2015

→ Joint **Press statement** on July 10<sup>th</sup>



Press Statement

Paris, 10 July 2015

## Scientists cite CCS as a viable and flexible climate change mitigation technology

At the international Scientific Conference "Our Common Future under Climate Change" in Paris from 7 to 10 July scientists presented Carbon dioxide Capture and Storage (CCS) as a viable technology to reduce emissions resulting from fossil fuel combustion and industrial processes and even as an opportunity for negative emissions through integration with renewable energy from biomass. This makes CCS a very flexible technology to mitigate climate change.





# CO<sub>2</sub>GeoNet at the COP 21 Conference

Paris (Le Bourget), France

30 November – 11 December 2015

## → UNFCCC Negotiation zone (accessible with accreditation)

- **Side-event (in English):** Carbon Capture and Storage (CCS): Achievements and Opportunities for Developing Country Involvement

**Dec. 1**  
**15:00-16:30**

- **Booth on CCS** **2 weeks**

*Co-organisation CO<sub>2</sub>GeoNet - University of Texas at Austin - CCSA*

## → Climate Generations Areas (open to the public)

- **Side-event (in French):** CO<sub>2</sub> Capture and Storage: a proven and safe technology vital for completing the climate change mitigation portfolio

**Dec. 2**  
**11:45-13:15**

- **Booth on CCS** **2 weeks**

*Organisation CO<sub>2</sub>GeoNet with French Club CO<sub>2</sub>, GCCSI, IEA*





# CO<sub>2</sub>GeoNet Annual Open Forum in Venice



→ Save the date:

11<sup>th</sup> CO<sub>2</sub>GeoNet Open Forum  
on 9-11 May 2016

→ Past edition: 10<sup>th</sup> Anniversary

- ✓ organized in collaboration with US DOE, European Commission and EERA
- ✓ endorsed by IEAGHG, CSLF and ZEP

see slides and video interviews at  
[www.co2geonet.eu](http://www.co2geonet.eu)



# Acknowledgements

## → CO<sub>2</sub>GeoNet Management Board (April 2015 – March 2017)

**President** Ton Wildenborg, TNO, The Netherlands

**Secretary General** Sergio Persoglia, Italy

### Executive Committee

**Chair** Ceri Vincent, BGS, UK

**Vice-Chair** Dominique Durand/Roman Berenblyum, IRIS, Norway

**Treasurer** Niels Poulsen, GEUS, Denmark

**Member** Rowena Stead, BRGM, France

**Member** Axel Liebscher, GFZ, Germany

**Member** Sabina Bigi, Univ. Rome, Italy

**Member** Marjeta Car, GEOINZENIRING, Slovenia

**President Emeritus** Isabelle Czernichowski, BRGM, France

## → CO<sub>2</sub>GeoNet Members (Status in 2015)



## → CGS Europe partners



**Contact us:** email: [info@co2geonet.com](mailto:info@co2geonet.com) website: [www.co2geonet.eu](http://www.co2geonet.eu)