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*PU = Public

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1. Introduction

Interaction with media is regarded as a main channel for effective dissemination and is an integral part of dissemination activities of CGS Europe (WP5, task 5.6). During the second reporting period the focus of the activities has been on the organisation of opportunities for direct interaction between researchers and journalists to facilitate the participation of the journalists in events organised by the network, where a more in-depth learning about the technology could take place (Chapter 2).

Main events such as CO₂GeoNet Open Forum or workshops with science journalists in Rome, Milan and Paris have been accompanied by press releases translated into several languages (Chapter 4). The project and its achievements have been disseminated at European level by a number of activities linked to Public Service Review, Global Scientia and Pan European Networks (Chapter 3).

Many initiatives have taken place at national level to present CO₂ geological storage in the media (newspaper and magazine articles, radio interviews, internet-based media, etc.) and to raise general awareness of CCS in the partner countries. All the activities have been focused on the provision of scientifically sound information to the media.

This report includes an overview of the events that have been organised by the project and of their journalistic follow-up, interviews, press releases and other media-related activities.

2. Direct interaction with journalists

In the second project period, actions were taken to further develop CGS Europe media communication through direct interaction with science journalists. Direct exchange with media professionals proved to be the best channel for the dissemination of complex scientific knowledge, such as the multidisciplinary research area of the geological storage of CO₂.

The participation of science journalists in events such as the annual CO₂GeoNet / CGS Europe Open Forum, where the latest research developments are presented, has been encouraged as an excellent opportunity for supporting a thorough understanding of the technology, different from what can be achieved through documents' reading or internet resources.

During the events organized by CGS Europe, the journalists had the opportunity of personal exchange with some of the most prominent researchers in the field and with other speakers and participants from all over the world, having thus access to better verification of scientific information. In this context important issues such as safety, monitoring and site selection have been discussed and a more precise and comprehensive coverage of the topic has therefore been facilitated.

2.1 Open Forum 2012

During the 7th CO₂GeoNet Open Forum that was held in Venice on 17-20 April 2012, the CGS Europe coordinator BRGM and the Italian project partners CO₂GeoNet-OGS and CO₂GeoNet-URS organised participation of several French and Italian journalists. There was also media coverage by ENEL, one of the Open Forum sponsors. The journalists participated to the Open Forum and also requested individual interviews with some of the researchers. It was a very positive experience for the researchers to spend some time explaining to the journalists about CO₂ geological storage and latest research results.



Opening session of the 7th CO₂GeoNet Open Forum in Venice

2.1.1 Echoes of Open Forum 2012

The journalists participating in the 7th CO₂GeoNet Open Forum 2012 produced a number of articles based on the information from the conference and the interviews with scientists present in Venice. A brief overview of the outcomes is presented below in chronological order.

Journal de l'environnement – France

Isabelle Czernichowski-Lauriol, Pascal Audigane and Catherine Truffert of BRGM and Nick Riley of BGS gave an interview to “Le journal de l’environnement” the first French daily online news. The interview was used in the article “CO₂: Chercheurs européens cherchent fonds, désespérément (Funding wanted – a desperate cry from European CO₂ researchers)” that was published on 19 April 2012. The article has also an online version that is available at <http://www.journaldelenvironnement.net/article/co2-chercheurs-europeens-cherchent-fonds-desesperement,28627>. The journal website is well visited by 175,000 people monthly and 340,000 pageviews per month; the number of newsletter subscribers is 34,500.

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Energie - Gaz à effet de serre

CO2: chercheurs européens cherchent fonds, désespérément

Le 19 avril 2012 par Valéry Laramée de Tannenber

» Energie, Politique climatique, Politique & Société, Recherche, Entreprises, Politique, Climat



Réunis à Venise, les spécialistes européens du stockage géologique du gaz carbonique désespèrent de trouver l'argent nécessaire à la poursuite de leurs travaux.

Pour la 7e année consécutive, l'île vénitienne de San Servolo accueille, cette semaine, le congrès de CO2 Geonet. Derrière cet énigmatique acronyme se cache le gratin de la recherche européenne sur le stockage géologique du gaz carbonique.

«C'est un réseau d'excellence européen réunissant 300 scientifiques de 13 instituts de recherche qui travaillent sur le stockage du CO2», résume sa présidente, Isabelle Czernichowski-Lauriol. «Dans ce réseau unique au monde, nous réunissons toutes les disciplines nécessaires à la constitution d'une expertise: des géosciences à la biologie, en passant par l'écologie», poursuit la chercheuse du BRGM.

Au fil des ans, ce réseau a su constituer une somme de connaissances et d'expériences qu'il entend bien capitaliser. «Même si chaque site est particulier, nous savons que la géologie du continent peut accueillir plusieurs siècles d'émissions industrielles», rappelle-t-elle.

Faute d'accès aux données produites par les géologues des compagnies gazières et pétrolières, les scientifiques ont développé des trésors d'ingéniosité pour améliorer leur capacité de modélisation: «Ce qui est indispensable lorsqu'il s'agit de caractériser une structure géologique», souligne Pascal Audigane, du BRGM.



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» Les ions perchlorate, nouvelles stars de la sécurité des aliments?
 27/11/2013

Online version of the article in “Journal de l'environnement”

Le Monde - France

CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM, Sergio Persoglia of CO2GeoNet-OGS and Roberto Martinez of S-IGME gave an interview to the French newspaper Le Monde. The interview was used in the article “*Enfouir pour mille ans le gaz carbonique, ce n'est pas si simple* (Burying CO₂ underground for a thousand years is not that easy)” that was published on 20 April 2012. The article has also online version that is available at http://www.lemonde.fr/cgi-bin/ACHATS/acheter.cgi?offre=ARCHIVES&type_item=ART_ARCH_30J&objet_id=1189933&xtmc=herve_kempf&xtcr=145. Le Monde is the main French newspaper with a circulation of about 350,000 printed copies every day. It also has an electronic online version with over 40 million visits monthly; www.lemonde.fr is the number-one news website in French.

5



Screenshot of the article in Le Monde - electronic version

Environnement magazine - France

CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM gave an interview to the “Environnement magazine”. The interview was used in the article “*Une référence scientifique dans le stockage du CO₂* (Scientific reference in CO₂ storage)” published on 23 April 2012. The Environnement magazine is the leading French press title focusing on environmental issues. It is published monthly in both printed (11,500 copies) and electronic versions. The total audience is about 50,000 readers. Engineers, technicians, managers of all levels, environmental advisors and government officials count among the most important readers’ groups of the magazine.



Carnet**IANESCO**

Christophe Gandon est le nouveau directeur de l'Institut d'analyses et d'essais en chimie de l'ouest (Ianesco), laboratoire spécialisé dans l'environnement à Poitiers. Âgé de 44 ans, Christophe Gandon est ingénieur de l'École des hauts polymères et titulaire d'un doctorat de physique. Depuis 2008, il travaillait pour le groupe Oropi, successivement comme directeur d'usines, puis comme directeur technique.

GRAND PORT MARITIME DU HAVRE

Hervé Martel a été nommé président du directoire du Grand port maritime du Havre. Âgé de 46 ans, cet ingénieur en chef des ponts et chaussées, titulaire d'un DEA en économie des transports et d'un master en management public, était directeur général de Ports de Paris depuis septembre 2009.

DUNKERQUE PORT

Christine Cabau Woehrel, 48 ans, vient d'être nommée présidente du directoire de Dunkerque-Port. Elle arrive à Dunkerque-Port avec une longue expérience dans le domaine du transport maritime, acquise à partir de 1987 au sein du groupe CMA-CGM.

FNE

Bruno Genty a été reconduit à la présidence de la fédération France Nature Environnement à l'occasion de son assemblée générale.

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**INTERVIEW**

Isabelle Czernichowski,
présidente de CO₂ GeoNet

www.co2geonet.com



« Une référence scientifique dans le stockage de CO₂ »

Responsable au BRGM de l'unité « Valorisation des aquifères profonds », Isabelle Czernichowski préside aussi CO₂ GeoNet. Cette association a organisé du 17 au 19 avril son forum annuel. Avec un objectif : fédérer la recherche européenne sur le stockage géologique de CO₂.

Quel est l'état des connaissances sur le stockage de CO₂ ?

Les capacités du sous-sol européen sont estimées à quelques centaines d'années d'émissions. Mais ces calculs restent assez théoriques. Le sous-sol profond – au-delà de 800 mètres – est encore très méconnu. Des modélisations sont nécessaires pour savoir dans quelle quantité, en combien de temps et avec combien de puits le CO₂ peut être injecté. Il faut s'assurer de la sûreté du stockage en termes de rejets locaux. Des outils de surveillance et des solutions en cas de problème sont aussi à développer. Or, au niveau géologique, chaque site est spécifique.

Cette diversité disperse-t-elle la recherche ?

Le forum CO₂ GeoNet a été l'occasion de présenter tous les projets financés par l'Union européenne et des collaborations internationales. Nous cherchons à développer un réseau pour atteindre une masse critique de chercheurs pluridisciplinaires. L'association a été créée en 2008 avec 13 instituts, dont les français BRGM et IFPEN, issus de 7 pays : Danemark, Allemagne, Italie, Pays-Bas, Norvège, Royaume-Uni et France. Mais depuis, les travaux se sont multipliés en Europe de l'Est et du Sud. Il nous a paru indispensable de créer une entité

scientifique plus représentative de l'Europe. Le projet CGS Europe vise d'ici à fin 2013 à créer un consortium paneuropéen pérenne. Il comprend déjà 34 instituts issus de 28 pays.

Comment fédérer les avancées scientifiques ?

Nous voulons être un organisme scientifique de référence sur le stockage géologique de CO₂. Pour cela, nous attachons beaucoup d'importance à acquérir tout le savoir sur ce thème, à développer et diffuser les connaissances. En mars, nous avons organisé en Pologne une « université de printemps », sur huit jours, réunissant une vingtaine de doctorants et post-doctorants de tout le continent. Nous sommes aussi en train de constituer une base de données qui sera accessible à tous, en ligne, à partir des rapports rendus publics. Par ailleurs, l'Union européenne passe au stade des démonstrateurs. En 2010, un appel à projets a été lancé et 13 dossiers ont été soumis, dont celui d'Arcelor Mittal en Lorraine. La sélection aura lieu en fin d'année. L'injection dans le sous-sol n'aura pas lieu avant 2015. Les retours d'expériences seront pour 2020. Ensuite, nous espérons que la technologie pourra se déployer. Tout dépendra des coûts et du prix du carbone. TB

Le potentiel des centrales à gaz

Le groupe de réflexion britannique Green Alliance s'est penché sur le potentiel, en Europe, de la capture et du stockage de CO₂ issu des centrales à gaz. Selon une étude qu'il a récemment publiée, pour 60 % d'entre elles en 2030, la possibilité de captage n'aura pas été validée ou il y aura des difficultés d'accès à un site de stockage. Il alerte sur les risques de bâtir aujourd'hui des centrales sur des sites qui seront incompatibles avec le stockage. En 2030, le parc européen de centrales à gaz susceptibles d'être couplées au stockage atteindrait 50 à 100 GW, selon Green Alliance. Les cinq plus grandes économies du continent (Allemagne, France, Italie, Espagne et Royaume-Uni) présenteraient le plus grand potentiel. TB

www.green-alliance.org.uk

L'Usine à ges - France

CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM and Samuela Vercelli of University of Rome La Sapienza (CO2GeoNet-URS) gave an interview to "L'Usine à ges", the only French business paper dedicated to climate change. It is a monthly newsletter published ten times a year. It is written by journalists of the Energograd group. "L'Usine à ges" is independent of any company, institution or group pressure. Its audience counts more than 10,000 readers each month, both French and other French-speaking Europeans. "L'Usine à ges" presents the current climate from its main angles: scientific, political, economic and legal. The interviews were used in the article "*La séquestration géologique du CO₂ tient-elle ses promesses?*" (Does Geological Storage of CO₂ keep us to its promises?), accompanied by the interview with Samuela Vercelli titled "*Est-il facile de faire accepter la séquestration du carbone?*" (Is it easy to accept the storage of CO₂?). The articles were published in April 2012.



Dossier

Volodia OPRITCHNIK, envoyé spécial à Venise

La séquestration géologique du CO₂ tient-elle ses promesses ?

Espoir des scientifiques et des industriels, le stockage géologique du gaz carbonique est victime de la crise financière et de débâcles techniques. Faut-il toujours la considérer comme une technique anti-réchauffement ?

Voilà vingt-six ans, deux chercheurs norvégiens imaginent une drôle de solution pour se débarrasser du CO₂ des centrales thermiques : injecter dans des structures géologiques étanches. Erik Gustav Bruun Linderberg et Toralf Holt viennent d'inventer le concept de stockage géologique du carbone, l'une des premières armes à intégrer le réchauffement climatique.

Pour la plupart des experts, l'idée des deux scientifiques de la Fondation norvégienne pour la recherche scientifique et industrielle (Sintef) est proprement géniale. Plus besoin de transition énergétique : il suffit de capter le CO₂ des effluents gazeux des centrales électriques, raffineries et autres usines sidérurgiques, et de le transporter avant de l'injecter dans le sous-sol.

Un million de tonnes sous la mer
Motivée par la lourde taxe carbone que le royaume vient d'inscrire à son code des impôts, Statoil essaye les plates. Pour réduire son imposition, la compagnie pétrolière norvégienne décide d'injecter dans un aquifère salin, situé dans le sous-sol de la mer du Nord, le million de tonnes de CO₂ que produit annuellement sa plate-forme gazoise Sleipner II. Suivie par des centaines d'opérateurs du monde entier, l'opération débute en 1996. Elle n'a connu aucun incident jusqu'ici.

Deux ans plus tard, le pétrolier canadien Cenovus annonce son intention d'utiliser le gaz carbonique produit par une usine américaine pour améliorer la productivité de ses puits de pétrole : situés à 320 km de l'usine Un « carbo-duc » est tiré entre le Dakota du nord et le Saskatchewan. L'injection de dioxyde de carbone

débute en 2000. Réduisant à néant les émissions carbonées de l'usine américaine tout en accroissant la longévité des puits de Weyburn, la rentabilité de l'opération est maximale.

En 2005, le Giec évalue l'intérêt de l'invention de Linderberg et de Holt. Dans un rapport spécial, l'institution onusienne estime que 9 à 45 % des émissions industrielles de gaz carbonique peuvent être évitées grâce au captage-stockage de dioxyde de carbone (CSC). « Si l'on prend les rapports du Giec, de l'Agence internationale de l'énergie ou d'autres, on compte pouvoir réduire de 20 % les émissions antérieures de gaz carbonique grâce au CSC », confirme Catherine Truffert, directrice de la recherche du BRGM.

Des siècles d'émissions
Relativement bien connus des géologues, le sous-sol européen offre d'ailleurs d'importantes opportunités. « Même si chaque site est particulier, nous savons que la géologie du continent peut accueillir plusieurs siècles d'émissions industrielles », estime Isabelle Czernichowski-Lauriol, présidente de CO2GeoNet, l'un des principaux réseaux européens de recherche sur le stockage géologique du gaz carbonique. Curieusement, alors que les pétroliers américains injectent depuis des décennies du CO₂ dans leurs puits pour en améliorer le rendement, ce sont les Européens qui mettent le paquet sur la « séquestration du carbone ». Via ses programmes-cadres pour la recherche et son programme destiné à accélérer la transition énergétique (Set Plan), la Commission subventionne à tour de bras les projets des instituts de recherche et des industriels. Des consortiums de recherches fleurissent : la plate-forme zéro

émission, CO2GeoNet, CO2Europe (pour élaborer les grands « carboducs » européens), etc. Dans la foulée, de petites opérations de CSC éclosent : à Porto Tolle, en Italie ; à Belchatow, en Pologne ; à Jämschwalde, en Allemagne ; à Compostilla, en Espagne. Peu désireuse de partager ses données, Total monte son propre projet de captage-transport et stockage, à Boussy, près de Pau.

Pour encadrer cette activité promise à un brillant avenir, l'Europe publie une directive encadrant les activités de transport et de stockage géologique du gaz carbonique, dans le cadre du paquet énergie climat de 2008.

10 milliards d'euros par an
Certe sur le gîteau, la réalité de l'industrie vers une économie compétitive à faible intensité de carbone à l'horizon 2050 place le CSC au cœur de la stratégie climatique communautaire. Toujours débattue par les États membres, cette communication de la Commission stipule que la solution du captage et stockage de carbone devrait également être étendue à grande échelle après 2035, notamment pour capter les émissions des procédés industriels. Cela nécessiterait un investissement annuel de plus de 10 milliards d'euros.

Réunis, mi-avril, dans la petite lie venétienne de San Servolo, les participants au réseau CO2GeoNet ont fait le point sur leurs travaux. Mais aussi sur la situation. Laquelle est moins brillante qu'il n'y paraît.

Il y a quelques années, la Commission européenne espérait voir fonctionner une douzaine d'installations de taille industrielle vers 2015.

Dossier

Volodia OPRITCHNIK, envoyé spécial à Venise

Electriciens et équipementiers annonçaient une banalisation de la technologie à partir de 2020. Deux visions bien optimistes.

Dans les prochains mois, la Banque européenne d'investissement (BEI) dévoilera les projets de CSC, de taille industrielle, qu'elle soutiendra, grâce à la NEI 300. Imaginé en 2009, ce dispositif a permis de confier 300 millions de quotas d'émission de GES à la BEI. En les cédant au meilleur prix, la banque européenne devait financer jusqu'à 50 % des coûts de construction et de fonctionnement d'installations de CSC. Sur la quinzaine de projets présélectionnés par la Banque, la Commission européenne n'en retiendra qu'une demi-douzaine. Voie moins.

Une paire de projets
Mi 2009, le quota européen flirte avec les 15 euros. « À l'époque, la Commission et les experts de la BEI espéraient retirer jusqu'à 7 milliards de la vente des quotas. Aujourd'hui, la monétisation de ces quotas se situe à un prix oscillant entre 6 et 7 euros, et il faut plutôt tabler sur 2 milliards de recettes », résume un proche du dossier. De quel financer une paire de projets, guère plus. Or, sans expérimentation grandeur nature, scientifiques et industriels n'osent pas enregistrer les projets techniques nécessaires pour abaisser les coûts. Lesquels restent très élevés. Pour une centrale au charbon, construite dans un pays de l'OCDE, le coût de production atteint 105 dollars/MWh (80 euros) avec CSC, contre 55 dollars (42 euros) pour une installation crachant son carbone dans l'atmosphère, indique une récente étude de l'Agence internationale de l'énergie.

Énergéticiens, les installations de captage diminuent sensiblement (de 8 % à 10 %) le rendement énergétique d'une centrale thermique. Imposantes, ces installations représentent un investissement de l'ordre de plusieurs centaines de millions d'euros. « Les coûts de production d'électricité décarbonée par le CSC sont inférieurs à ceux de l'éolien off-shore. Ce qui reste encore trop élevé pour les électriciens. Reason pour laquelle, cette technologie doit bénéficier d'une aide au déploiement comme les autres technologies de décarbonisation », préconise Philippe Paelinck, vice-président d'Altom Power, chargé de l'environnement.

D'où que vienne le financement (du contribuable ou du consommateur, voire des deux), industriels et scientifiques ont besoin d'argent pour aller de l'avant. Hélas, l'oselle se fait rare en cette période de crise.

Inquiétantes fractures
D'autant que des projets phares de recherches ne donnent pas d'aussi bons résultats qu'espérés. Lors du séminaire de San Servolo, Klaus Walmann a souligné quelques inquiétudes. Le géologue de l'Institut des sciences marines de Kiel (Allemagne) a annoncé avoir mis à jour, à proximité du puits d'injection de Sleipner II, une jeune fracture géologique d'une douzaine

Quelle place pour le captage ?
L'une des principales conditions nécessaires à l'injection du CO₂ dans le sous-sol, c'est de disposer d'importants volumes de... CO₂. Ce qui suppose d'équiper de systèmes de captage de gaz carbonique les installations industrielles fortement émettrices (centrales électriques à flammes, raffineries). À de très rares exceptions près (en Suède, en France, au Danemark ou aux États-Unis), aucune chaudière industrielle n'est ainsi pourvue. En cause : les coûts sont prohibitifs (jusqu'à un milliard d'euros pour les installations les plus importantes), les sites de stockage opérationnels se comptent sur les doigts d'une main, les législations ne sont guère incitatives. Le potentiel est pourtant important. Une étude de l'IAIE, portant sur les 10 pays du monde comptant le plus de centrales électriques au charbon (Chine, USA, Inde, Japon, Corée du Sud, Afrique du Sud, Pologne, Allemagne, Russie, Australie), estime que 390 à 1 000 GW de capacités existantes pourraient être ainsi équipées d'ici à 2035. De quoi éviter l'émission de 2 à 5,3 milliards de tonnes de CO₂ par an. Qu'on se le dise !

Sophie d'Anhalt

Entretien

Est-il facile de faire accepter la séquestration du carbone ?

Psychologue à l'université de Rome La Sapienza, Samuela Vercelli travaille sur la question de l'acceptation du stockage géologique du carbone. Un sujet diablement complexe.

Comment les riverains d'un site potentiel d'injection de CO₂ appréhendent-ils un tel projet ?

Samuela Vercelli : Différentement des experts. Les techniciens considèrent que le stockage géologique du carbone est une technologie sûre. Se fondant sur l'étanchéité des gisements d'hydrocarbures, ils estiment qu'il n'y a aucun risque à injecter dans le sous-sol d'importants volumes de gaz carbonique. Dans leur très grande majorité, les riverains d'un site potentiel d'injection du CO₂ ignorent tout de cette technique et souvent des problématiques qui s'y rattachent.

Ils savent, tout de même, que le CO₂ est un gaz à effet de serre...

Samuela Vercelli : Pas forcément. C'est la raison pour laquelle les promoteurs d'un projet de stockage doivent mener un double travail. En premier lieu, il faut expliquer les tenants et aboutissants du projet. Cela va des rejets de carbone du secteur industriel – qui contribuent au réchauffement climatique – jusqu'aux éventuels risques pour la santé que ferait peser la présence d'un site de stockage. Mais attention ! Les citoyens n'ont plus confiance dans les experts. Aussi, la démarche pédagogique relèvera-t-elle, non pas d'un sursaut éducatif, mais des représentants des disciplines concernées, médecins compris. Ce panel devra être accompagné par les représentants politiques locaux. C'est cette

Enel sharing website - Italy

In April 2012, a summary of the CO₂ GeoNet Open Forum 2012 in Venice, titled “*Il CO₂GeoNet Open Forum a Venezia*”, was published on Enel sharing website [enelsharing.enel.com](http://enelsharing.enel.com/fonte/il-co2-geonet-open-forum-a-venezia/). The news is available at <http://enelsharing.enel.com/fonte/il-co2-geonet-open-forum-a-venezia/>




The screenshot shows a web page from the Enel sharing website. At the top, there is a header with the Enel logo on the left and the word 'Sharing' with a signal icon on the right. In the center of the header is a colorful graphic of various objects like a lightbulb, a gear, and a box connected by lines. Below the header, the page is titled 'DETTAGLIO POST'. The main content area has a 'Back' link, a timestamp '16/04/2012 alle 10:42', and a title 'Il CO₂ GeoNet Open Forum a Venezia'. The text describes the forum as a platform for sharing research results on CO₂ storage with stakeholders, institutions, and the public. It mentions that the forum is in its seventh edition and is held in Venice on San Servolo Island from April 17 to 19. Key speakers include Martina Doppelhaimer, Vassilios Kougionas, and Liliana Panei. It also mentions the participation of Pompilio Caramuscio and Silvana Iacobellis from Enel's Engineering and Innovation Division. The post is sponsored by Enel and highlights the company's focus on CCS technology. At the bottom, there are tags for 'ambiente', 'CCS', 'clima', 'CO₂', 'emissioni', 'enel', and 'GeoNet Open Forum'. It also shows the publication date, source, and a 'Giudizio' (Rating) section. Social media sharing icons for Facebook, Twitter, and LinkedIn are visible, along with a 'Like' button and a comment count of 1.

News on the Enel sharing website

2.1.2 Press release

A press release was prepared by CO₂GeoNet-URS in cooperation with other project partners on the occasion of the CO₂GeoNet Open Forum 2012. It was released on 12 April 2012, i.e. before the conference, and titled 'CO₂GeoNet and CGS Europe present the latest scientific outcomes on the geological storage of CO₂.



Press ReleaseApril 12, 2012

7th CO₂GeoNet Open Forum

CO₂GeoNet and CGS Europe present the latest scientific outcomes on the geological storage of CO₂

At a time when CO₂ capture and storage is earmarked as a technique capable of contributing 20% to CO₂ reduction targets by 2050 for combating climate change, researchers from all over Europe and the world will gather in Venice from 17th to 19th April 2012 to present and discuss the state-of-the-art on the geological storage of CO₂.

The 7th Open Forum of CO₂GeoNet, the European Network of Excellence on the Geological Storage of CO₂, will consider the most pressing CO₂ storage issues in the light of current scientific findings and developments. It will offer a complete overview of the latest scientific results unveiled by European and national research programmes. Key research topics include site characterization, modelling, monitoring, ecosystem impacts, site closure and abandonment, long-term fate of CO₂, and shared transport and storage infrastructure. A focus will be given to the pilot and demonstration projects currently being developed in Europe. The Forum also offers an update on international collaboration and on the progress of storage research and demos farther afield, with cases from Canada and Japan.

CO₂GeoNet has joined and strengthened forces through CGS Europe, the Pan-European coordination action on CO₂ Geological Storage, representing 34 research institutes and spanning 28 European countries. It pools long-standing experience on CO₂ geological storage and promotes widespread exchange.

Each year, the CO₂GeoNet Open Forum offers a unique opportunity to meet and interact directly with Europe's largest group of researchers on CO₂ geological storage. Over 130 delegates from more than 30 countries are expected at the Forum. Research institutes, Academic experts, industry leaders, representatives of several government services and international bodies, and the European Commission will participate in the debates and lectures offered during the three days of the agenda.

The full schedule of the 7th CO₂GeoNet Open Forum is available at www.co2geonet.com/openforum2012

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Press release announcing Open Forum 2012

CGS Europe workshop with EUSJA science journalists

CGS Europe researchers meet science journalists

Venice, San Servolo Island - 8th April 2013



2.2 CGS Europe Workshop with EUSJA science journalists – Venice, April 2013

The CGS Europe Workshop with EUSJA science journalists took place in Venice, San Servolo Island, Italy, on 8th April 2013. The workshop required a long preparation on the part of CO₂GeoNet-URS and CO₂GeoNet-OGS to develop the collaboration and coordination with EUSJA – the European Union of Science Journalists Associations (<http://www.eusja.org>). The workshop was then prepared by CO₂GeoNet-URS and CO₂GeoNet-OGS in collaboration with the CO₂GeoNet Executive Committee and CGS Europe WP5 team and co-organised with EUSJA. Science journalists were invited to participate to both the dedicated workshop and the follow-up CO₂GeoNet Open Forum.

The main aim of the workshop was to establish a relationship between the CGS Europe project/CO₂GeoNet Network of Excellence and the EUSJA Association and to promote the dissemination of scientific information on CO₂ geological storage through a continuous and long-term interaction between researchers and journalists. It is expected that this will increase the probability of scientifically correct coverage of CO₂ geological storage on the media.

A more specific objective of the workshop was to introduce the journalists into the topic of CO₂ geological storage (in particular regarding what this technology consists of, the way it works and it is monitored, where it is being implemented from European and international perspectives) and to raise their awareness of the scientific community working on it, to establish the Network as a scientific reference for the EUSJA journalists.



Discussion at the CGS Europe / EUSJA workshop in Venice

The workshop had 41 participants: 24 researchers and 17 journalists. The programme highlighted the relevance of this subject for Europe, and included a very lively and valuable debate. CGS Europe partners were very happy to have the European press participating to our Forum.

After a warm welcome by CO₂GeoNet / CGS Europe representatives, the workshop was introduced by Samuela Vercelli (CO₂GeoNet-URS), highlighting the importance of developing a direct relationship between the Network's researchers and science journalists to achieve a scientifically correct dissemination of research outcomes and the particular role CGS Europe and CO₂GeoNet can play thanks to its efforts for the integration and communication of research results. The link between science and society can thus be reinforced.

The reasons why we need CCS were then explained by Nick Riley (CO₂GeoNet-BGS). The group was introduced into the CCS technology in the EU and its implications for the environment and for climate change. A clear overview of the role of CO₂GeoNet & CGS Europe for the development of CO₂ storage was given by Isabelle Czernichowski-Lauriol (BRGM), showing the current state of the art of research, also in relation to the goals set for 2020 and beyond by the EU and the Member States. An overview of envisaged large-scale demos in Europe, pilot projects and field experiments and topics for further research was provided as well.

The second part of the session focused on technical and scientific concepts on CO₂ storage. First of all, a presentation on “How we know that CO₂ Storage works and how we monitor it” was given by Salvatore Lombardi (CO₂GeoNet-URS). He explained that CO₂ geological storage mimics natural gas reservoirs and that in a well-selected storage site leakage is not expected to occur. In case of gas migration toward the surface through faults, anomalies are generally spot-type and quite small in dimension (i.e. little impact on the shallow environments). Regarding leakage through wells, experience in managing eventual leaks already exists in the oil & gas industry. As far as monitoring tools are considered, a wide range of monitoring tools is available. The fate of injected gas can be traced from the reservoir up to the surface with enough accuracy and reliability.

This talk was followed by a clear overview of “Where can we store it? A European perspective of storage capacity in Europe” provided by Rob Arts (CO₂GeoNet-TNO). Pioneering research has identified and evaluated storage capacities. It was particularly rewarding to see, that many of the current EU projects nowadays also include studies on natural CO₂ reservoirs and vents, a subject in which CO₂GeoNet played a pioneering role from the start. In the last presentation, Sergio Persoglia (CO₂GEONET-OGS) illustrated “CCS projects in the world” and case studies. He also described the volumes of CO₂ that can potentially be stored by region or country; funds for demonstration projects, case stories from real CCS projects were also discussed.

The technical topics that were presented provided an opportunity for the journalists to learn more about important issues such as safety, the relationship between CCS and climate change, monitoring and site selection.

The presentations stimulated a number of questions on the part of the press; like, e.g.:

- Can you guarantee CO₂ will stay underground?
- How much CO₂ and for how long should be stored?
- In Germany we have 30 years capacity, what are we going to do afterwards?
- What is the available capacity compared to the foreseen production years?
- What would be the cost for its implementation in Europe?
- Is it a way to find new gas resources?

- Is this technology a competitor with shale gas or geothermal?
- What are the best places for storage in Europe and in the world?
- What is the definition of a storage pilot?
- What could be the effects on aquifers, chemical and physical reactions?
- How do you know that CO₂ storage works?
- How does the monitoring work?
- How can we make sure that these site are made in a safe manner?
- Is there enough storage capacity in Europe? And how is it calculated?

The discussion moved towards a very lively debate, getting more information on the state of play and activities carried out on CO₂ geological storage. The workshop ended with a reflection by the journalists, expressing the generally good impression received and, at the same time, the big surprise to see that there was a fairly comprehensive case history. It was an interesting day with lots of discussions and interactions in an open atmosphere.

2.2.1 *List of participating journalists*

András	FERENCZI	Origo.hu	HUNGARY
Harald	STOCKER	freelancer	GERMANY
Kai	DÜRFELD	freelancer	GERMANY
Robert	VISSCHER	freelancer	THE NETHERLANDS
Uwe	SPRINGFIELD	freelancer	GERMANY
Eva	RODRIGUEZ NIETO	News Agency	SPAIN
Rijkert	KNOPPERS	freelancer	THE NETHERLANDS
Henrik	BENDIX	Science Illustrated	DENMARK
Senne	STARCKX	freelancer	BELGIUM
Isamel	GARCIA HERRERO	freelancer	SPAIN
Gerhard	SAMULAT	freelancer	GERMANY
Violetta	EGIKOVA	Vice-President EUSJA	
Dorothee	LAPERCHÉ	Environnement et Technique Actu-Environnement	FRANCE
Monica	RIO	freelancer	ITALY
Yann	VERDO	Les Echos	FRANCE
Albane	CANTO	Environnement Magazine	FRANCE
Marc	MENNESSIER	Le Figaro	FRANCE

2.2.2 List of participating researchers



CGS Europe workshop with science journalists – Venice, 8 April 2013

List of CGS Europe researchers participating in the workshop

Panelists / speakers

Samuela Vercelli – University of Rome “La Sapienza” (Italy)
Researcher, CGS Europe leader of “Interactions with media”
Professional focus: Research on science dissemination issues and the public perception of innovative technologies, with particular regard to the geological storage of CO₂

Nick Riley – British Geological Survey (UK)
Head of Science Policy (Europe) at BGS, Chair of CGS Europe General Assembly
Professional focus: International expert on Carboniferous rocks. From 2001, adviser to UK government on Carbon Abatement Technologies until 2010. First President of the CO₂GeoNet Association in 2009-2011, he is currently Chair of the General Assembly of CGS Europe. In 2003 he was awarded an MBE by Her Majesty the Queen for “Services to UK GeoScience”.

Isabelle Czernichowski-Lauriol – BRGM (France)
President of CO₂GeoNet Association, Coordinator of CGS Europe
Professional focus: Management of research on CO₂ geological storage and other energy uses of the subsurface (geothermal energy, energy storage)

Salvatore Lombardi – University of Rome “La Sapienza” (Italy)
University professor
Professional focus: Monitoring of CO₂ storage sites and natural CO₂ occurrences, hydrogeology, hydrochemistry, isotope geology, geothermal research, oil and gas prospecting, soil gas surveys applied to tectonics, to seismic zonation and to environmental research

Rob Arts – TNO (the Netherlands)
Professor at the Delft University of Technology (2004-2010) and currently technology manager at TNO, Vice-chair of the ExCo of CO₂GeoNet, organizer of the Venice Open Forum within CGS Europe
Professional focus: All aspects of CO₂ geological storage with an emphasis on monitoring and verification. In the Netherlands Rob is coordinator of the subsurface part of the Dutch national CCS program CATO2.

Sergio Persoglia – National Institute of Oceanography and Experimental Geophysics – OGS (Italy)
Member of the OGS Board of Directors, Secretary General of CO₂GeoNet
Professional focus: CCS policy, management of CO₂ storage research projects, international networking, seismic data collection and processing

Ender Okandan – Middle East Technical University Ankara (Turkey)

Professor - Petroleum Research Center and Petroleum and Natural Gas Engineering Department

Professional focus: CO₂ storage capacity in Turkey, CO₂ as an EOR application, reservoir engineering of oil and gas fields

Gillian Pickup – Heriot-Watt University Edinburgh (UK)

Lecturer

Professional focus: Numerical Simulation of CO₂ Storage

Niels Poulsen – Geological Survey of Denmark and Greenland – GEUS (Denmark)

Senior research scientist, First Vice-Chair and Treasurer of the Executive Committee of CO₂GeoNet, task leader of CGS Europe Spring School on CO₂ storage, president of ENeRG (European Network for Research in Geo-Energy)

Professional focus: CO₂ storage capacity potential in aquifers and depleted gas and oil fields including enhanced oil recovery (EOR), improving methodologies for storage capacity assessment, site selection criteria and risk assessment, international activities to provide joint research, training and capacity building, information and communication

Hervé Quinquis – IFP Energies Nouvelles (France)

Business development manager at IFPEN; Executive Committee member of CO₂GeoNet; member of the secretariat of the European CCS project network; member of EERA CCS (European Energy Research Alliance) steering committee; convenor of the WG on "cross cutting issues" of the ISO TC 265 on CCS (normalisation committee); leader of the research infrastructure implementation plan of ECCSEL (European CCS laboratory Infrastructure).

Professional focus: Acceleration of the deployment of the CCS technologies and the development of advanced technologies addressing CO₂ storage in particular

Heike Rütters – Federal Institute for Geosciences and Natural Resources - BGR (Germany)

Research coordinator CO₂ storage

Professional focus: Fluid-rock interactions; impact of impurities

Bruno Saftic – University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering (Croatia)

Associate professor, leader of CGS Europe publication and presentation activities

Professional focus: Geological methods for definition of subsurface structures and rock properties needed for construction of underground carbon storage objects

2.2.3 The Agenda



CGS Europe researchers meet science journalists

San Servolo island, Venice – 8 April 2013

Agenda

- | | |
|---------------|--|
| 16.00 – 16.15 | "Introduction to the workshop: bridging science with society" –
Samuela Vercelli |
| 16.15 – 16.30 | "What CO ₂ storage is and why it is important" - Nick Riley |
| 16.30 – 16.45 | "CO ₂ storage developments and the role of CO ₂ GeoNet & CGS
Europe" - Isabelle Czernichowski |
| 16.45 – 17.05 | <i>Question time</i> |
| 17.05 – 17.30 | Coffee break |
| 17.30 – 17.45 | video: Futuris – EU studies CO ₂ capture in great carbon roundup |
| 17.45 – 18.00 | "How we know that CO ₂ Storage works and how we monitor it" -
Salvatore Lombardi |
| 18.00 – 18.20 | <i>Question time</i> |
| 18.20 – 18.35 | "CO ₂ Geological Storage: Where can we store it? A European
perspective" - Rob Arts |
| 18.35 – 18.50 | <i>Question time</i> |
| 18.50 – 19.05 | "CCS projects in the world" - Sergio Persoglia |
| 19.05 – 19.30 | <i>Question time</i> |



Discussion at the CGS Europe / EUSJA workshop in Venice

2.2.4 Echoes of the CGS Europe Workshop with EUSJA science journalists

The journalists participating in the Venice workshop 2013 produced a number of outcomes based on the experience from the workshop, the following Open Forum and the interviews with the scientists in Venice. The outcomes include articles in newspapers, journals, newsletters and online media, as well as several radio broadcasts. A brief overview of them is presented below.

Le Figaro - France

The article "*Stocker le CO₂ pour limiter le réchauffement* (Storing CO₂ for limiting global warming)" was published by "Le Figaro", on 11 April 2013. The article, based on the participation of the journalist – Marc Mennesier - in the EUSJA workshop and Open Forum 2013, is also available online at <http://www.lefigaro.fr/environnement/2013/04/11/01029-20130411ARTFIG00420-stocker-le-co2-pour-limiter-le-rechauffement.php>. "Le Figaro" is a leading French daily newspaper with a circulation of 337,000 copies and an electronic version.

Mise à jour

LE FIGARO.fr

ACTUALITÉ

ECONOMIE

SPORT

CULTURE

LIFESTYLE

MADAME

Edition

ABONNÉS

EN DIRECT 1

TOPS

DIAPOS

INFOGRAPHIES

BLOGS

VIDÉOS

LE FIGARO.fr

Newsletter

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Cartier

Conte de Noël

DÉCOUVREZ LE FILM

Stocker le CO2 pour limiter le réchauffement

[ACTUALITÉ](#) > [ENVIRONNEMENT](#) Par [Marc Mennessier](#) | Publié le 11/04/2013 à 10:57

L'AUTEUR

SUR LE MÊME SUJET

RÉAGIR (2)

PARTAGER

f t +

IMPRIMER

Découvrez la nouvelle version du Figaro.fr

Avec la hausse de la demande globale énergétique, le captage et stockage souterrain du CO2 représente une carte à jouer.

Qu'on le veuille ou non, la demande globale d'énergie devrait croître de 60 % d'ici à 2030, notamment dans les pays émergents, et avec elle les émissions de gaz carbonique (CO2). Pour ne rien arranger, le charbon, le gaz naturel et le pétrole, grands pourvoyeurs de gaz à effet de serre, garderont à cette date une part prépondérante dans le mix énergétique mondial en dépit d'une poussée significative, mais marginale, des énergies renouvelables (solaire, éolien, biomasse). Avec le risque de provoquer un emballement de la machine climatique et une acidification des océans préjudiciable à la biodiversité. Dans ce contexte, le CSC, captage et stockage souterrain du CO2 généré par de nombreuses industries (prospection gazière et pétrolière, centrales thermoélectriques, sidérurgie, cimenterie), représente indiscutablement une carte à jouer.

PUBLICITÉ

Cadremploi.fr

Les offres d'emploi

Les opportunités à l'étranger et DOM TOM

Découvrir

< 1/5 >

Title page of the article in Le Figaro – electronic version

Les Echos - France

The article "*Stockage du CO₂: faut-il encore y croire?* (CO₂ storage: can we still believe in it?)" was published in "Les Echos", on 21 May 2013. It is based on participation of the journalist - Yann Verdo - in the EUSJA workshop and Open Forum 2013. The article is also available online at http://www.lesechos.fr/journal20130521/lec1_idees_et_debats/0202705086658-stockage-du-co2-faut-il-encore-y-croire-567859.php. "Les Echos" is a daily French financial newspaper published in 120,000 printed copies and electronic version.

The screenshot shows the Les Echos website interface. At the top, there is a search bar and navigation links for 'CONNEXION', 'INSCRIPTION', 'Le journal', 'Newsletters', and social media icons. Below this is a main navigation bar with categories like 'NEWS', 'BOURSE', 'PATRIMOINE', 'BUSINESS', 'TV', and 'ART & LIFESTYLE'. A secondary navigation bar lists various topics: 'FRANCE', 'INTERNATIONAL', 'INDUSTRIE-SERVICES', 'TECH', 'MÉDIAS', 'FINANCE-MARCHÉS', 'RÉGIONS', 'IDÉES', 'BILANS GRATUITS', and 'DATA'. The main content area features the article 'Stockage du CO₂ : faut-il encore y croire ?' under the heading 'IDÉES & DEBATS // PROSPECTIVE ENVIRONNEMENT'. The article is dated 'Les Echos n° 21439 du 21 Mai 2013 • page 12'. To the right of the article is a large advertisement for the 'Nouveau Toyota RAV4' with a price of '22 990€*'. Below the advertisement, there is a section titled 'Sur ce thème' with a list of names: 'SCIENCES ET TECHNOLOGIES', 'CHRISTIANA FIGUERES', 'CATHERINE TRUFFERT', and 'ISABELLE CZERNICHOWSKI-LAURIOL'.

RECHERCHEZ SUR LES ECHOS **CONNEXION** **INSCRIPTION** **Le journal** **Newsletters** **Ecoutez en direct** **SITES DU GROUPE**

Les Echos.fr **NEWS** **BOURSE** **PATRIMOINE** **BUSINESS** **TV** **ART & LIFESTYLE** **ABONNEZ-VOUS**

FRANCE **INTERNATIONAL** **INDUSTRIE-SERVICES** **TECH** **MÉDIAS** **FINANCE-MARCHÉS** **RÉGIONS** **IDÉES** **BILANS GRATUITS** **DATA**

IDÉES & DEBATS // PROSPECTIVE ENVIRONNEMENT

Stockage du CO₂ : faut-il encore y croire ?

Les Echos n° 21439 du 21 Mai 2013 • page 12

Vingt ans après sa mise au point, la séquestration géologique du carbone peine à se concrétiser. Un outil jugé pourtant indispensable pour lutter contre le réchauffement climatique.

L'humanité est entrée « dans une nouvelle zone de danger », a alerté la semaine dernière la responsable climat de l'Onu, Christiana Figueres, au vu de l'évolution de la concentration de dioxyde de carbone (CO₂) dans l'atmosphère. De nouvelles mesures réalisées par l'observatoire de référence installé sur le volcan de Mauna Loa, à Hawaï, ont fait apparaître une concentration de ce gaz à effet de serre légèrement supérieure à 400 parties par millions (ppm). Un niveau inégalé depuis l'ère du pliocène, il y a entre 3 et 5 millions d'années, lorsque la température moyenne à la surface de la Terre était de 3 à 4 degrés plus chaude qu'aujourd'hui. Avec une telle teneur en CO₂ dans l'atmosphère, les experts du Giec jugent inatteignable l'objectif de contenir le réchauffement à une hausse de 2 °C par rapport aux niveaux préindustriels, seuil au-delà duquel il existe un risque de voir le système s'emballer et produire des événements climatiques extrêmes en série.

Le CO₂ étant principalement produit par la combustion des énergies fossiles (pétrole, charbon, gaz naturel), il n'existe que deux moyens de faire baisser la quantité de ce gaz que nous relâchons quotidiennement dans l'atmosphère. Soit en réduisant la part des hydrocarbures dans notre « mix » énergétique, ce qui paraît un horizon pour le moins lointain (ils ont encore représenté 87 % de la consommation mondiale d'énergie en 2011). Soit - en attendant que nous ayons suffisamment décarboné notre économie - en captant à la source le CO₂ relâché dans l'air et en l'enfouissant sous terre.

TOUJOURS MIEUX TOUJOURS PLUS LOIN

Nouveau Toyota RAV4
SEL 124CH

À PARTIR DE 22 990€*
Sous condition de reprise

Sur ce thème

- SCIENCES ET TECHNOLOGIES
- CHRISTIANA FIGUERES
- CATHERINE TRUFFERT
- ISABELLE CZERNICHOWSKI-LAURIOL

The title page of the article in Les Echos – electronic version

ARGUS actueel - Belgium

The article “*Toekomst CO₂-opslag hangt aan een zijden draadje* (Future of CO₂ storage hangs by a thread)” was published at ARGUS actueel, an environmental-news website of a financial group, on 13 May 2013. The article is based on participation of the journalist - Senne Starckx - in the EUSJA workshop and Open Forum 2013 and on an interview with Kris Welkenhuysen of RBINS-GSB. The article is available online at <http://www.argusactueel.be/internationaal-nieuws/toekomst-co2-opslag-hangt-aan-een-zijden-draadje>.

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Teken in op de ARGUSactueel Nieuwsbrief
De milieunieuwssite van ARGUS

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[« Toekomst CO₂-opslag hangt aan een zijden draadje](#)

INTERNATIONAAL
EUROPA
BINNENLAND
OPINIE
ARGUSLEEST
BEELD VAN DE WEEK

13 Mei 2013 - Toekomst CO₂-opslag hangt aan een zijden draadje

Hoe ver staat het met de plannen om uitgestoten CO₂ weer op te vangen en onder de grond op te slaan, het zogenaamde CCS? Kennelijk botst een doorbraak op financiële restricties. Een verslag.

Het kleinschalige pilotproject in Lacq, Zuid-Frankrijk.

Eén ton CO₂ is op de Europese uitstootmarkt momenteel vijf euro waard. Dat is veel te weinig om privé-investeers warm te maken voor grootschalige demonstratieprojecten voor de afvang- en opslag van het belangrijkste broeikasgas. Het enige Europese land waar de technologie uit de startblokken geraakt, is Noorwegen – waar een strenge koolstofmarkt bestaat.

De toekomst voor de afvang en opslag van koolstofdioxide of CO₂ (carbon capture & storage, afgekort CCS) hangt – althans in Europa – aan een zijden draadje. Van de zes grootschalige demonstratieprojecten die in 2008 met veel poeha werden aangekondigd, is er vijf jaar later niet een uit de startblokken geschoten. Nochtans is CCS, zeg maar de technologie om fossiele brandstoffen te kunnen 'witwassen' door CO₂ (en andere broeikasgassen) eraan te onttrekken, volgens voorstanders onontbeerlijk om de ambitieuze Europese klimaatdoelstellingen te halen – minstens 80 procent reductie van de broeikasuitstoot tegen 2050. Ook de Europese Commissie blijft halsstarrig geloven in CCS als mitigerende oplossing, vooral dan om de periode te overbruggen die hernieuwbare energiebronnen nodig hebben om volwassen en alomtegenwoordig te worden. Volgens officiële cijfers kan CCS voor 20 procent bijdragen aan de vooropgestelde emissiebeperking in de EU.

Ingestorte koolstofmarkt

Toen de zes demoprojecten in 2008 werden gepresenteerd, kregen ze gezamenlijk één miljard euro mee uit het European Energy Programme for Recovery (EEPR). Vijf van de zes demo's omvatten een zogenaamd volledige CCS-keten, waarbij een bestaande gas of kolencentrale wordt uitgerust met afvangtechnologie, waarna het afgevangen CO₂ wordt getransporteerd naar en geïnjecteerd in een gunstig ondergronds bassin. Maar om de projecten te laten slagen, was er over een periode van een decennium meer dan vijf miljard euro nodig – geld dat door de economische crisis nooit is toegezegd. Daarbij komt dat, sinds het begin van de crisis in 2008, de Europese ruilmarkt voor emissierechten compleet is ingestort. Waar een ton CO₂ in het European Trading System (ETS) in 2008 nog goed was voor een bedrag tussen de 16 en 20 euro, is deze prijs intussen gedaald naar een schamele vijf euro per ton CO₂. Daar het er niet naar uitziet dat de koolstofmarkt snel weer in beweging komt, is het dus moeilijk om privé-investeers warm te maken voor grootschalige demoprojecten voor CCS.

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Teken in op de ARGUSactueel Nieuwsbrief

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Screenshot of the article at ARGUS actueel – electronic version

Videnskab.dk - Denmark

23 April 2013, an article titled "*CO₂ kan gemmes i undergrunden* (CO₂ can be stored underground)" was published on the Danish media website Videnskab.dk. Its author - Henrik Bendix – was one of the participants of the Venice workshop with journalists. The article reveals the potential and benefits of the CCS technology and quotes Niels Poulsen, GEUS representative in CGS Europe, Niels Peter Christensen (Gassnova), member of the CGS Europe Advisory Body and Danish Climate Minister Martin Lidegaard. The article is available at <http://videnskab.dk/miljo-naturvidenskab/co2-kan-gemmes-i-undergrunden>. An English translation of the article is provided in Annex I to this report.

Videnskab.dk is an independent news media focused on research and is written and edited by an independent editorial board. It covers research widely - from culture and society to technology and science. Its vision is to make people smarter by creating greater interest in science - and to know something - in society in general, and particularly among the young. The site was launched in 2008 in order to stimulate interest in research in the Danish society. In 2013, nearly 600,000 unique users visited Videnskab.dk monthly. The site is in the Top 50 of most visited Danish websites.

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CO₂ kan gemmes i undergrunden

23. april 2013 kl. 03:35 14 kommentarer

Man kan skaffe sig af med drivhusgassen CO₂ ved at sende den ned i undergrunden - på den måde kan man begrænse den globale opvarmning. I Danmark vil regeringen dog hellere stå på sidelinjen. Klimaministeren kalder teknologien umoden.

Emner: Bæredygtighed, Energi, Forurening, Fremtidens energi, Innovation, Klima, Miljø, Politik
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Af: [Henrik Bendix](#), journalist

Den menneskeskabte globale opvarmning skyldes CO₂ fra afbrænding af kul, gas og olie, som vi henter op fra undergrunden. Kilden til problemet ligger altså under vores fødder, men måske ligger en del af løsningen også der.

Det er nemlig muligt at indfange CO₂'en og sende den ned i jorden, hvor den kan gemmes sikkert af vejen i tusinder eller millioner af år.

Den forurenende luftart kan pumpes ned i udtømte olie- og gasfelter eller i reservoirer af saltvand dybt nede i jorden. Geologerne har lokaliseret masser af steder, som er velegnede til langvarig CO₂-lagring - også i den danske undergrund.

Det går for langsomt

Europas førende forskere inden for opsamling og lagring af CO₂ - på engelsk carbon capture and storage, forkortet CCS - har netop været samlet til konferencen CO₂GeoNet Open Forum i Venedig, og Videnskab.dk var inviteret med.

Siden 1996 er 13 millioner tons CO₂ sendt tilbage til undergrunden ved det norske gasfelt Sleipner. Var det ikke sket, havde drivhusgassen forurenet atmosfæren i stedet. (Illustration: Statoil)

ANNONCEINFO

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- 09/1 Nyt fund: Velstående vikinger hvidkalkede deres vægge
- 10/1 Ny forskning: Selvoptagede mennesker har større risiko for kræft

Title page of the article at Videnskab.dk – electronic version

Le journal de l'environnement CO₂ – France

The article "*CO₂: la recherche européenne à court d'argent* (CO₂: European research runs out of money)" was published by "Le journal de l'environnement" on 15 April 2013. The article is based on the participation of the journalist – Valéry Laramée de Tannenberg - in the EUSJA workshop and Open Forum 2013. "Le journal de l'environnement" is the first daily online news server focusing on Environment, Health and Safety. The site is visited by ca. 175,000 people per month with 340,000 pageviews per month; the number of subscribers of the newsletter is 34,500.

The article is available at <http://www.journaldelenvironnement.net/article/co2-la-recherche-europeenne-a-court-d-argent,34184>

Journal de l'environnement

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Energie - Politique climatique

CO₂: la recherche européenne à court d'argent

Le 15 avril 2013 par Valéry Laramée de Tannenberg
Politique & Société, Recherche, Administrations

C'est dans la centrale de Bełchatów (Pologne) que pourrait être installée la prochaine installation industrielle de captage de CO₂.

Tragique paradoxe. Alors que ses politiques climatiques semblent vouées à l'échec, l'Europe se désintéresse de plus en plus du stockage géologique de gaz carbonique, seule technologie disponible pour réduire rapidement l'empreinte carbone de l'industrie lourde. Telle est la principale conclusion que l'on peut tirer du séminaire que vient d'organiser, à Venise, CO₂GeoNet, le plus grand réseau mondial de chercheurs dédié à la séquestration du carbone.

Les signes avant-coureurs étaient là. L'an passé, aucun projet de captage-stockage de CO₂ (CSC) n'avait été sélectionné par Bruxelles pour bénéficier des subsides du programme NER 300, faute d'un accompagnement financier suffisant des industriels et des Etats membres [JDL]. Plus en amont, aucun projet comparable n'a bénéficié du 1,5 milliard d'euros prévu par le plan de relance européen de 2009 pour les infrastructures énergétiques.

L'explication est connue. Faute d'incitation suffisante à réduire leurs émissions carbonées, les industriels rechignent à investir dans des installations dont les coûts se chiffrent en centaines de millions d'euros. Cas le plus caricatural: les subventions du programme NER 300. Celles-ci sont financées par la vente de 300 millions de quotas, laquelle était censée, selon ses promoteurs, rapporter entre 4 et 6 Md€. Or l'effondrement des prix des quotas d'émission a ramené au milliard la manne disponible. Résultat: avec deux opérations industrielles en service (Sleipner et Snøhvit) et un projet en cours de réalisation (Mongstad), la Norvège consacre plus d'argent que toute l'Union européenne au développement du stockage géologique du carbone. Affligeant.

Pis, les expérimentations lancées ces dernières années marquent le pas. Total a cessé, plus tôt que prévu, l'injection de CO₂ dans l'ancien gisement de gaz naturel de Rouse. Et nul ne sait encore l'avenir réservé à cette expérimentation (surveillance du site à long terme ou relâchement du CO₂). «Faute d'entente entre l'ENI et l'ENEL italiennes, le projet d'injection de Porto Tolle n'a finalement jamais vu le jour», rappelle Samuella Vercelli, de l'université Sapienza de Rome. En Pologne, le projet de Dziwie pourrait ne jamais émerger, faute de subventions.

Ce mouvement n'est pas sans inquiéter les scientifiques. Lancé en 2010, dans le cadre du 7^e programme-cadre de recherche et développement (PCRD), le programme européen sur le stockage du carbone n'est désormais plus financé. Or c'est grâce à ce CGS que les chercheurs de l'UE ont bâti et financé CO₂GeoNet. Faute d'argent, c'est non seulement un sujet majeur pour la lutte contre les changements climatiques qui va disparaître de l'agenda communautaire, mais aussi une réelle compétence scientifique et technique.

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- Obésité: la nouvelle charte du CSA plus étendue
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- Cancer: un nouveau méfait des sucres ajoutés?
04/12/2013
- Les allergies alimentaires moins mortelles que la route
04/12/2013

VEILLE REGLEMENTAIRE

hsemonitor

Screenshot of the article in Journal de l'environnement – electronic version

EUSJA website (European Union of Science Journalists' Associations)

The article “*Fighting against Windmills – Is carbon storage an appropriate option to mitigate climate change?*” was published on the EUSJA website on 14 April 2013. The article is based on the participation of the author - Gerhard Samulat - in the EUSJA workshop and Open Forum 2013.

The article is available online at <http://www.eusja.org/fighting-against-windmills-is-carbon-storage-an-appropriate-option-to-mitigate-climate-change/>

The screenshot displays the EUSJA website interface. At the top is a black header with the EUSJA logo and the text "European Union of Science Journalists' Associations", accompanied by a row of European flags. Below the header is a navigation bar with links: News, Study trips, Conferences, Jobs, Debate, BLOG, workshops, and social media icons. The main content area features an article titled "Fighting against Windmills – Is carbon storage an appropriate option to mitigate climate change?" by Gerhard Samulat, dated 14 April 2013. The article text discusses the concentration of carbon dioxide (CO2) in the atmosphere and the need for carbon capturing and storage (CCS). It mentions the annual Open Forum of the CO2GeoNet in Venice, where 17 EUSJA Journalists attended. A photograph of the Venice skyline is included. To the right of the article is a sidebar with a photo of a workshop titled "EUSJA workshop on Investigation, statistics and storytelling." Below this is a "SIGN THE PETITION!" section featuring a petition on change.org titled "Russian government: Preserve freedom of science in Russia. Pull the bill back!" with a photo of a large crowd. At the bottom of the sidebar is a link to "The latest issue of EUSJA News".

Screenshot of the article on the EUSJA website

ORIGO.hu - Hungary

The Hungarian news server ORIGO.hu published on 9 May 2013 the article titled „*Alig működik a szén-dioxid-varázslat* (Hitch in carbon dioxide magic)“. Its autor, András Ferenczi, participated in the EUSJA workshop and Open Forum 2013 in Venice. The article provides an overview of the CCS technology and its current status, including description of risks and barriers of deployment. It also quotes, among other, CGS Europe scientists Nick Riley (CO₂GeoNet-BGS) and Sergio Persoglia (CO₂GeoNet-OGS). The article is available online at <http://www.origo.hu/idojaras/20130508-hol-tart-a-szendioxidlevalasztas-tarolas-technologia-uveghazhaz-klimavaltozas-globalis-felmelegedes.html>. A Hungarian translation of the article is provided in Annex II to this report.

Origo.hu is one of the leading Hungarian news websites. The site is visited by 800,000 – 1,000,000 people a day. The site is one of the oldest news websites in Hungary, founded in 1998. Its scientific articles are the most quoted in the area of popular science.

The screenshot shows the Origo.hu website interface. At the top, there is a banner for 'minden mobil 0 Ft!' with an illustration of reindeer. Below the banner, the Origo logo is displayed alongside the date '2013. december 11. szerda' and the location 'Árpád'. The current weather is shown as '-9°C / +5°C' with a cloud icon and the text 'Felhős idő várható'. A search bar with the text 'enhanced by Google' and a 'WEB Origo' button are also present. The navigation menu includes links for 'HÍREK', 'SPORT', 'OKOS', 'ÉLETMÓD', 'KULTÚRA', 'PIAC', 'SZOLGÁLTATÁS', and 'freemail'. Below the menu, there is a section for 'IDŐJÁRÁS MA ÉS A HÉTEN' with links to 'HÁNY FOK LESZ MA ÉS HOLNAP?', 'ÁRVÍZ', 'KLÍMAVÁLTOZÁS', and 'BLOG: 365 ZÖLD ÖTLET'.

Alig működik a szén-dioxid-varázslat

FERENCZI ANDRÁS | 2013. 05. 09. 07:54

Ez a cikk 216 napja frissült utoljára. A benne szereplő információk a megjelenés idején pontosak voltak, de mára elavultak lehetnek.

Mai időjárás: Békéscsaba térsége

0°C 15 órákor Szél: 1 m/s 230° Felhőzet: 22 % Csapadék: 0 mm	-1°C 16 órákor Szél: 1 m/s 200° Felhőzet: 7 % Csapadék: 0 mm	-1°C 17 órákor Szél: 1 m/s 285° Felhőzet: 7 % Csapadék: 0 mm
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Holnapi időjárás

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Napos idő várható
7 napos előrejelzés »

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Velencében egy volt elmeógyógyintézet épületében rendeztek európai konferenciát a szén-dioxid földalatti tárolásának lehetőségeiről. A résztvevők szerint ez nem örült ötlet, csak nagyon sok pénz kell hozzá. Pénz pedig van bőven, például az olajipari cégektől.

A megújuló energiaforrások térnyerése ellenére még mindig nagy részben szénből, olajból és gázból **fedezi** energiaigényét a világ, és ezen a közeljövőben nem is lehet változtatni a szén-dioxid leválasztását és tárolását (CCS) támogató szakemberek szerint.

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Ahol 50-szer annyi jut stadionra, mint felújításra

SZERDA 09:50

Screenshot the title page of the article on the Origo.hu website

Kennislink.nl - Netherlands

The article “*Wetenschappers pleiten voor CO₂-opslag pilots* (Scientists plead for CO₂ storage pilots)” was published on kennislink.nl, a Dutch popular science web, on 15 April 2013. The article is based on the participation of the author - Robert Visscher - in the EUSJA workshop and Open Forum 2013. The article is available online at <http://www.kennislink.nl/publicaties/wetenschappers-pleiten-voor-co2-opslag-pilots>.

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Achtergrond maandag 15 april 2013 Dit is een publicatie van Kennislink

Wetenschappers pleiten voor CO₂-opslag pilots

Door burgerprotesten en de financiële crisis worden vele grootschalige CO₂-afvang en opslaginitiatieven uit of afgesteld. Voorstanders slaan daarom een nieuwe weg in. Op het achtste CO₂GeoNet open forum in Venetië pleiten ze voor kleinschalige pilotprojecten. Zoals het vervoer van CO₂ via schepen naar opslagvelden en een combinatie met geothermie.

door **Robert Visscher**

Nu al varen grote vrachtschepen vol met kleding, auto's of olie over de wereldzeeën. Misschien komen daar binnenkort wel grote boten bij die CO₂ naar al leeggehaalde, offshore gasvelden brengen. Dat is een van de interessante pilotprojecten die tijdens het forum wordt besproken.



Omgebouwde LNG-schepen kunnen de CO₂ vervoeren naar voormalige gasvelden.
 Tennet-Gas

Zo'n schip vaart bijvoorbeeld met CO₂ vanuit de haven van Rotterdam naar een gasveld onder de Noordzee. Vervolgens gaat de CO₂ naar een tussenstation, waar het wordt bewerkt zodat het geschikt is voor ondergrondse opslag. Het gas wordt namelijk met een temperatuur van vijftig graden onder nul vervoerd en dat is te koud voor ondergrondse opslag vanwege mogelijke ijsvorming.

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co2 opslag, co2-opslag, geothermie

Lees ook



Veiliger rijden dankzij rijsimulator
10 december 2013



Gepensioneerde telescoop 'redt' Nederlandse nanosatelliet
9 december 2013



Nederlandse meteoriet duikt op bij hobby-expositie
8 december 2013

Nieuwe fosfaatfabriek

Screenshot of the title page of the article on the Kennislink.nl website

Servicio de Información y Noticias Científicas (SINC) – Spain

The article “*Salvo en la zona más occidental, en el resto de España hay posibilidades de almacenar CO₂* (Spain has large potentiality for CO₂ storage except in its Western part)” was published by SINC (Servicio de Información y Noticias Científicas), a Spanish news agency, on 15 April 2013. The article contains interview with Roberto Martínez Orío, CGS Europe Management Board member and representative of S-IGME in the project. The interviewer was Eva Rodríguez, a Spanish science journalist participating in the EUSJA workshop and Open Forum 2013. The article is available online at <http://www.agenciasinc.es/Entrevistas/Salvo-en-la-zona-mas-occidental-en-el-resto-de-Espana-hay-posibilidades-de-almacenar-CO2>.

The screenshot shows the SINC (Servicio de Información y Noticias Científicas) website. The header includes the SINC logo with the tagline "La ciencia es noticia", navigation links like "¿Quiénes somos?", "FAQ", "Licencia", "Contacto", and "Mapa del sitio", and a search bar. The main navigation bar lists various scientific fields: PORTADA, CIENCIAS NATURALES, TECNOLOGÍAS, BIOMEDICINA Y SALUD, MATEMÁTICAS, FÍSICA Y QUÍMICA, HUMANIDADES, CIENCIAS SOCIALES, POLÍTICA CIENTÍFICA, and INNOVACIÓN. Below this, there are sub-navigation links for NOTICIAS, REPORTAJES, ENTREVISTAS, MULTIMEDIA, AGENDA, ESPECIALES, OPINIÓN, ALERTAS, EMBARGOS, and INVESTIGADORES. The article title "Roberto Martínez Orío, ingeniero de minas del IGME" is followed by the main headline "“Salvo en la zona más occidental, en el resto de España hay posibilidades de almacenar CO₂”". Below the headline, there is a brief summary of the article, social media sharing buttons (Facebook, Twitter, LinkedIn, etc.), and a photo of Roberto Martínez Orío. The right sidebar features a "LO ÚLTIMO" section with several short news items and a "LO MÁS VISTO" section at the bottom.

Screenshot of the title page of the article on the SINC agency website

Ö1 radio - Austria

One of the German journalists participating in Venice (Uwe Springfeld) produced two radio contributions to the popular science radio magazine "*Dimensionen – die Welt der Wissenschaft* (Dimensions – the world of science)", which is broadcasted on the Austrian Ö1 radio station. The contributions were broadcasted on 19 and 26 April 2013 under the title "*Kann die Speicherung von Kohlendioxyd die Klimaänderung verlangsamen?*" (Can carbon dioxide storage slow down the climate change?). Among others, they include interviews with Nick Riley (CO₂GeoNet-BGS), Bruno Saftic (UNIZG-RGNF) and Gillian Pickup (CO₂GeoNet-HWU), recorded in Venice. The annotations of the two programmes are available at <http://oe1.orf.at/programm/334737> and <http://oe1.orf.at/programm/335522>.

The screenshot shows the OE1 ORF.at website interface. At the top, there's a navigation bar with 'ORF' and 'Live' buttons, and a menu with '7 Tage Ö1', 'Campus', and 'Journale'. Below this is a secondary navigation bar with 'Programm', 'Musik', 'Kultur', 'Journale', 'Wissen' (highlighted), 'Gesellschaft', and 'Religion'. On the right of this bar are 'Log In' and 'Suche' links.

The main content area is titled 'Wissen'. On the left, there's a sidebar with a 'zurück' link and the date 'Freitag 19. April 2013 19:05'. The main title is 'Dimensionen - die Welt der Wissenschaft *'. The content lists four topics: 1. Kann die Speicherung von Kohlendioxyd die Klimaänderung verlangsamen?, 2. Die Dunkle Materie der DNA, 3. Die Finanzhändler und ihre Sprache, and 4. Frauen im Exil: Shanghai. It also mentions 'Redaktion und Moderation: Franz Tomandl'.

Below the topics, there's a paragraph: 'Für die einen ist Kohlenstoffspeicherung in unterirdischen Sondermülldeponien der Königsweg, um die Klimaveränderung zu verlangsamen. Auf diese Weise würden die Klimakiller der Atmosphäre und dem System Erde entzogen. Für die anderen klingt allein schon die Idee, wegschließen und vergessen wie aus dem "Rezeptbuch des Teufels" abgeschrieben, weil es auf der Erde keine abgeschlossenen Räume gebe. Früher oder später komme jeder Dreck wieder ans Licht. Kürzlich trafen sich in Venedig über 130 Experten zum Thema Speicherung von Kohlendioxyd. Mit Nick Riley, Geologe, British Geological Survey; Bruno Saftic, Geologe, Universität von Zagreb. Autor: Uwe Springfeld.'

On the right side, there's a 'WISSEN Programm' section with a calendar grid showing dates from 1 to 30. Below this is a 'WISSEN Downloads' section with a link to 'Dimensionen - die Welt der Wissenschaft' and a 'HÖRPROBE' button. There are also sections for 'Betrifft: Geschichte' and 'Digital.Leben', each with a 'HÖRPROBE' button and an 'Externer Player' link. At the bottom right, there's a link to 'alle Downloads'.

Annotation of the "Dimensionen" broadcast of 19 April 2013 on the Ö1 website

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Dimensionen - die Welt der Wissenschaft *

Freitag
26. April 2013
19:05

1. Kann die CO2-Speicherung die Klimaänderung verlangsamen? (II)
2. Quantenfalle für Licht und Atome
3. Wie sich Erpresser in der Evolution durchsetzen können
4. Welteis oder: Was meinte die Glazialkosmogonie

Redaktion: Franz Tomandl

1. Kann die Speicherung von Kohlendioxyd die Klimaänderung verlangsamen? (II): Das Beispiel Ketzin

In Ketzin vor den Toren Berlins wurde 1964 der erste unterirdische Erdgasspeicher der DDR errichtet. Er funktionierte nie so richtig, immer wieder entwich Gas und einige Jahre nach Inbetriebnahme des Speichers musste der oberirdisch gelegene Ortsteil von Ketzin aufgegeben werden. Er wurde abgerissen. Der Erdgasspeicher hingegen wurde weiterbetrieben. Noch bis ins Jahr 2000. Dann kamen die Wissenschaftler des Geoforschungszentrums Potsdam. Und richteten eine neue Gaslagerstätte ein, diesmal für das Treibhausgas CO₂. Denn, so die Idee, in die Erde gepresstes Kohlendioxid kann das Klima nicht weiter anheizen. Natürlich nur, sofern das Gas auch dort bleibt, wohin es die Forscher pressen. Nächstes Jahr läuft das Experiment namens CO₂-Man aus. Erkenntnisse gibt es jetzt schon zuhauf. Diskutiert wurden sie auf einer Konferenz, die sich kürzlich in Venedig ausschließlich mit dem Thema der unterirdischen CO₂-Speicherung befasste. Mit Sonja Martens, Geoforschungszentrum Potsdam, Leiterin des Pilotprojekts CCS in Ketzin, Brandenburg
Gillian E. Pickup, Geologin, Institut für Petroleum engineering, Universität Edinburgh.
Autor: Uwe Springfeld

WISSEN
Programm
1

Mo	Di	Mi	Do	Fr	Sa	So
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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29	30					

Mai ▶

Gestern Heute Morgen

WISSEN
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Dimensionen - die Welt der Wissenschaft

▶ HÖRPROBE
Externer Player

Betrifft: Geschichte

▶ HÖRPROBE
Externer Player

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Annotation of the “Dimensionen” broadcast of 26 April 2013 on the Ö1 website

RBTF Première radio - Belgium

Related to the Open Forum held in Venice in April 2013, the Royal Belgian Institute of Natural Sciences (RBINS) issued a press release. Next to providing general information, it also highlighted the joining of one of the institute's departments, the Geological Survey of Belgium (GSB), to the CO₂GeoNet association.

Following this press release, Kris Piessens, a geologist at the GSB, was contacted by Sophie Brems, RTBF for a radio interview on CCS. RTBF is the public broadcasting organisation of the French Community of Belgium, with Première being its radio station dedicated to news, information, talk and culture. Both audio quotes, as well as general information provided during the interview, were used for an environmental radio column discussing for about 8 minutes the different aspects of CCS, in particular CO₂ geological storage. Although the interview covered all critical aspects of CO₂ geological storage, the tone of the interview was neutral, with room for the experts to counter general misconceptions.

The interview was broadcasted on 26 April 2013 and was entitled '*Stockage géologique de CO₂*' (Geological storage of CO₂).

RTVSLO Channel Art – Slovenia

On 25 April 2013, Marjeta Car from Geoinženiring was interviewed by Goran Tenze, journalist of the Slovenian National Radio. The motivation for the interview was the information on the CGS Europe workshop with journalists in Venice. The interview was broadcasted by the Slovenian National Radio on 13 May 2013 at 13:05. The 25 minute time slot was broadcasted in the frame of the regular weekly broadcast "*View into science*" (Channel Art, RTVSLO). The discussion was aimed at non-geoscientific public and was focused on general facts on CCS and in particular on CO₂ geological storage, on estimated capacities for CO₂ globally, in Europe and in Slovenia and on the outcomes of the Open Forum 2013.

2.2.5 Press releases

Two press releases were devoted to the Open Forum 2013. The first one was released before the event, on 18 March 2013, under the title '8th CO₂GeoNet Open Forum: CO₂ storage pilots and international collaboration'. This press release was also published on CORDIS Wire, a press releases service provided by CORDIS, the European Community Research and Development Information Service, on 20 March 2013.

The second press release was issued on 16 April 2013 with the title '8th CO₂GeoNet Open Forum: European developments on CO₂ storage pilots and international research collaboration'. It brought information about the outcomes of conference and discussions held at the event. The press release was translated into 13 languages (German, Greek, English, French, Italian, Hungarian, Latvian, Polish, Serbian, Slovak, Slovenian, Finnish, Swedish) to facilitate dissemination on national level (see CGS Europe web for overview <http://www.cgseurope.net/NewsData.aspx?IdNews=85&ViewType=Actual&IdType=478>).

Moreover, this press release was taken over by all leading CCS-related newsletters, like, e.g., Greenhouse News, Carbon Capture Journal Newsletter, Bellona CCS newsletter or Capture Ready, which ensured an excellent level of dissemination among CCS stakeholders worldwide.



Press Release

18 March 2013

8th CO₂GeoNet Open Forum: CO₂ storage pilots and international collaboration

Do pilot projects represent today, in Europe, the main avenue to achieve fundamental learning experiences for the implementation of the geological storage of CO₂? How can they contribute to the overall progress of this technology within an international collaboration framework?

Researchers from all over Europe will gather in Venice on 9-11 April 2013 to propose a scientific perspective on the way forward for the geological storage of CO₂ in Europe and discuss progress together with stakeholders.

The 8th Open Forum, organised by CO₂GeoNet, the European Network of Excellence on the Geological Storage of CO₂, and CGS Europe, the Pan-European Co-ordination Action on CO₂ geological storage, will focus on CO₂ storage pilots, since demonstration projects designed to test the feasibility of the CO₂ capture and storage (CCS) technology at a large-scale are facing major challenges which may result in significant delays or even cancellations.

Isabelle Czernichowski-Lauriol of BRGM, France, the President of CO₂GeoNet and Co-ordinator of CGS Europe, explains: *"To ensure that CO₂ storage research continues to move forward, small-scale pilot projects may provide an alternative and/or complementary solution to the big demo projects. Pilot projects are lower cost open research platforms, quicker to implement and can provide a strong focus on specific topics. It is time to discuss and assess the need and added value of small-scale pilot storage projects compared to large-scale demonstrations, the critical issues that need to be addressed, and whether goals can be achieved in time."*

Typical questions addressed in the forum will be: What can we learn from pilot projects that we cannot do at larger scales? What can we learn from pilot projects that can directly be applied to commercial scale implementation? Should we design pilot storage projects on sites which could later become full-scale storage facilities?

The keynote speaker for this 8th CO₂GeoNet Open Forum will be Hervé Le Treut, climatologist, member of the Intergovernmental Panel on Climate Change (IPCC). He will present on April 10th the latest scientific evidence on climate change, followed by a discussion on the role of CO₂ storage as a mitigation option.

Each year, the CO₂GeoNet Open Forum offers a unique opportunity for stakeholders to meet and interact directly with Europe's largest group of researchers on CO₂ geological storage. Over 130 delegates from more than 30 countries are expected at the Forum. Academic experts, Research institutes, Industry leaders, Regulators, Representatives of the European Commission and of several government services and international bodies will participate in the debates and lectures offered during the three days of the agenda.

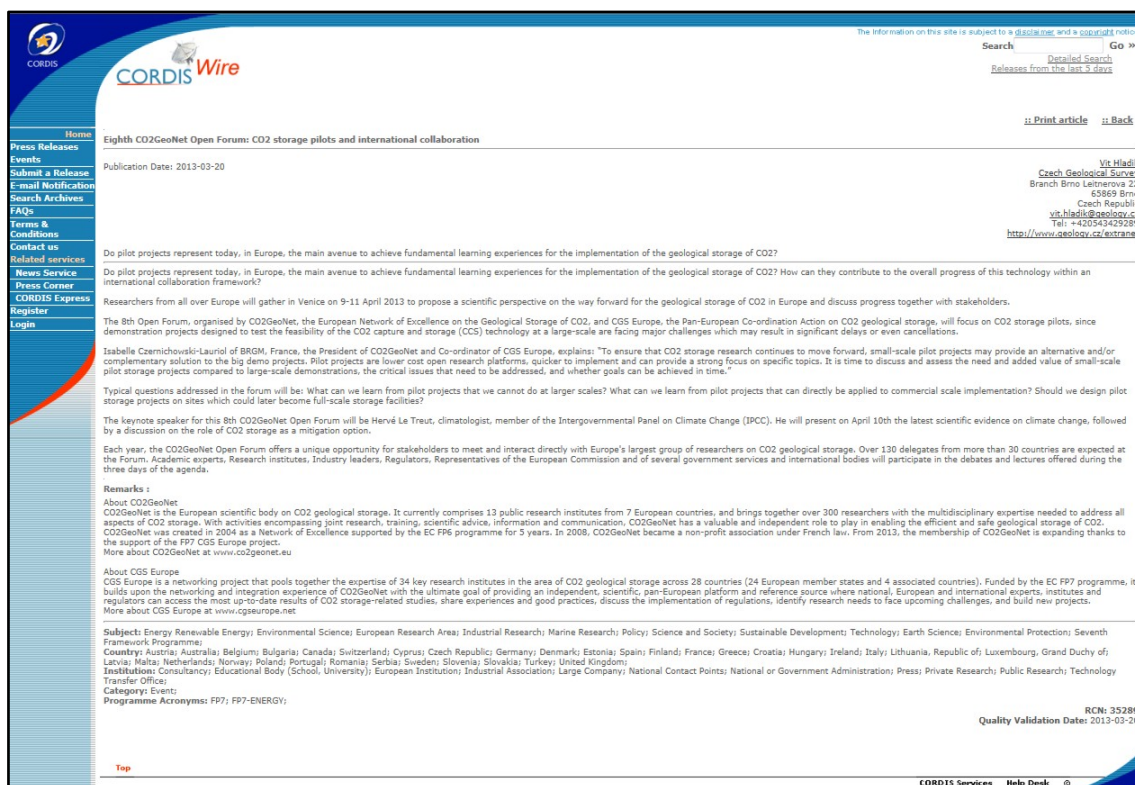
Full details of the 8th CO₂GeoNet Open Forum are available at www.co2geonet.com

Press Contacts:

CO₂GeoNet Secretariat – Sergio Persoglia: +39 329 26 07 303 e-mail: info@co2geonet.com


CGS Europe – Vit Hladik, leader of knowledge dissemination activities: +420-721 167 807 e-mail: vit.hladik@geology.cz

Press release announcing Open Forum 2013



The screenshot shows the CORDIS Wire website interface. The main content area displays a press release titled "Eighth CO2GeoNet Open Forum: CO2 storage pilots and international collaboration" with a publication date of 2013-03-20. The release discusses the 8th CO2GeoNet Open Forum, organized by CO2GeoNet, the European Network of Excellence on the Geological Storage of CO2, and CGS Europe. It highlights the forum's focus on CO2 storage pilots and international collaboration, mentioning key speakers like Hervé Le Treut and Isabelle Czernichowski-Lauriol. The website also features a sidebar with navigation links and a search bar.

Press release announcing Open Forum 2013 published on CORDIS Wire website



Press Release 16th April 2013

**8th CO₂GeoNet Open Forum:
European developments on CO₂ storage pilots
and international research collaboration**

Researchers from all over Europe have met in Venice on 9-11 April 2013 to propose a scientific perspective on the way forward for the geological storage of CO₂ in Europe and discuss progress together with stakeholders.

Pilot projects¹ have a key role for the advancement of CO₂ storage related research in Europe, which could bring a significant contribution to the innovation goals of the Horizon 2020 European programme. Further, the importance of pilot projects has been highlighted for the strategic developments they can offer, at a moment when large demo projects² are facing delays. Pilot projects will also provide vital information to enable the wide deployment of CO₂ geological storage.

The climatologist Hervé Le Treut, member of the IPCC panel, explained that the climate change patterns which are presently observed do correspond to the changes anticipated by models since three decades. This makes it all the more important to act for the reduction of CO₂ emissions. "CO₂ capture and storage can contribute 20% of the necessary reductions and combined with biomass energy it is the only carbon negative³ technology available" declared Nick Riley, Chair of CGS Europe General Assembly.

Unfortunately, the low value of carbon credits has undermined public efforts for supporting CO₂ capture and storage demonstration and increased the uncertainty in investment planning. In this situation storage pilots remain the place for different stakeholders to work together and further improve methodologies that can apply to specific geological aspects of storage sites: "Each site is unique and requires individual evaluation. European researchers are developing tools and sharing knowledge that will enable safe and reliable CO₂ storage in Europe" affirmed Isabelle Czernichowski-Lauriol, President of CO₂GeoNet and Co-ordinator of the CGS Europe project.

Store CO₂ in the underground may become, under conditions to be investigated, a resource for the future, suggested Lionel Perrette, representative of the French Ministry of Ecology. Within this forward

¹ What is a storage pilot?
A storage pilot is a CO₂ injection into a geological formation of usually less than 0.1 Mt in order to perform research experiments on geological CO₂ storage.

² What is a CCS demo?
A CCS demonstration project has to implement the full chain of technologies for CO₂ capture, transport and storage at an industrial scale of several Mt of CO₂, as a stepping stone to commercial deployment, e.g. on a power plant or a steel plant.

³ What does carbon negative mean?
Carbon negative means extracting CO₂ from the atmosphere and storing it. In the context of CCS - CO₂ Capture and Storage, this means using biomass as a fuel (the plants take CO₂ from the atmosphere), capturing the CO₂ from burning the biomass and storing that CO₂ in a geological formation, thereby removing CO₂ from the atmosphere.

Press Contacts:
CO₂GeoNet Secretariat – Sergio Persoglia: +39 329 26 07 303 email:info@co2geonet.com
[Other contacts can be added for national translations & release](#)

looking perspective there is an important role for CO₂GeoNet in explaining to the wider public what CO₂ geological storage is and why we need to achieve the urgent goal of first reducing CO₂ emissions in the atmosphere and in the second half of this century even reduce CO₂ concentrations, suggested Manfred Treber from Germanwatch.

A new paradigm for CO₂ storage public involvement was proposed by Samuela Vercelli, CO₂GeoNet Executive Committee member: "People should not find themselves in the position to 'accept' a storage site. If given the possibility to identify and understand the advantages of storing CO₂ and hosting a storage site they will have their own reasons for doing it. Instead of looking for public acceptance, dialogue should be sought. Storage pilots can be an excellent opportunity to experience a dialogue approach with the population".


Many delegates expressed appreciation for the event for the high level of presentations, open discussions and opportunities for exchange.

Each year, the CO₂GeoNet Open Forum offers a unique opportunity for stakeholders to meet and interact directly with Europe's largest group of researchers on CO₂ geological storage. Over 150 delegates from more than 30 countries have participated in the 2013 Forum. Academic experts, Research institutes, Industry leaders, Scientific journalists, Regulators, Representatives of the European Commission, of several government services, of international bodies and from civil society have participated in the debates and lectures offered during the three days of the agenda. Presentations will soon be available on the website.

Full details of the 8th CO₂GeoNet Open Forum are available at www.co2geonet.eu

Press Contacts:
CO₂GeoNet Secretariat – Sergio Persoglia: +39 329 26 07 303 email:info@co2geonet.com
[Other contacts can be added for national translations & release](#)

Press release on outcomes of Open Forum 2013



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8th CO₂GeoNet Open Forum on CO₂ storage pilot projects held in Venice

19.04.2013

Researchers from all over Europe met in Venice on 9-11 April 2013 to present a scientific perspective on the way forward for the geological storage of CO₂ in Europe and to discuss progress together with stakeholders.

The conference was co-organised by CO₂GeoNet - a scientific association of 13 research institutes from 7 countries and CGS (a project funded within the 7th Framework Programme of the European Community for coordination action on CO₂ geological storage).

Pilot projects play a key role in the advancement of the CO₂ storage-related research in Europe, which could bring a significant contribution to the innovation goals of the Horizon 2020 programme. The importance of pilot projects has been highlighted due to the strategic developments they can offer, at a moment when large demonstration projects are facing delays. Pilot projects will also provide vital information to enable wide deployment of CO₂ geological storage.

The climatologist Hervé Le Treut, member of the IPCC panel, explained that the climate change patterns which are presently observed do correspond with the changes anticipated by models over the last three decades. This makes it all more important to pursue reductions of CO₂ emissions.

"CO₂ capture and storage can contribute 20% of the necessary reductions and combined with biomass energy it is the only carbon negative technology available" said Nick Riley, Chair of CGS Europe General Assembly.

The record low prices of EUAs (emission unit allowances) have undermined public efforts for supporting CO₂ capture and storage demonstration and increased the uncertainty in investment planning. In this situation storage pilots remain the opportunity for different stakeholders to work together and further improve methodologies that can apply to specific geological aspects of storage sites.

"Each site is unique and requires individual evaluation. European researchers are developing tools and sharing knowledge that will enable safe and reliable CO₂ storage in Europe" explained Isabelle Czernichowski-Lauriol, President of CO₂GeoNet and Coordinator of the CGS Europe project.


A new paradigm for CO₂ storage public involvement was proposed by Samuela Vercelli, CO₂GeoNet Executive Committee member: "People should not find themselves in the position to 'accept' a storage site. If given the possibility to identify and understand the advantages of storing CO₂ and hosting a storage site they will have their own reasons for doing it. Instead of looking for public acceptance, dialogue should be sought. Storage pilots can be an excellent opportunity to experience a dialogue approach with the population".

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is the only technology available for

massive cuts in CO₂ emissions from

fossil fuel

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*Article in Bellona CCS newsletter based on the press release
on outcomes of the Open Forum 2013*




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8th CO2GeoNet Open Forum on CO2 storage pilot projects held in Venice

Apr 20 2013

Researchers from all over Europe met in Venice on 9-11 April 2013 to present a scientific perspective on the way forward for the geological storage of CO2 in Europe and to discuss progress together with stakeholders.

The conference was co-organised by CO2GeoNet - a scientific association of 13 research institutes from 7 countries and CGS (a project funded within the 7th Framework Programme of the European Community for coordination action on CO2 geological storage).

Pilot projects play a key role in the advancement of the CO2 storage-related research in Europe, which could bring a significant contribution to the innovation goals of the Horizon 2020 programme. The importance of pilot projects has been highlighted due to the strategic developments they can offer, at a moment when large demonstration projects are facing delays. Pilot projects will also provide vital information to enable wide deployment of CO2 geological storage.

The climatologist Hervé Le Treut, member of the IPCC panel, explained that the climate change patterns which are presently observed do correspond with the changes anticipated by models over the last three decades. This makes it all more important to pursue reductions of CO2 emissions.

"CO2 capture and storage can contribute 20% of the necessary reductions and combined with biomass energy it is the only carbon negative technology available" said Nick Riley, Chair of CGS Europe General Assembly.

The record low prices of EUAs (emission unit allowances) have undermined public efforts for supporting CO2 capture and storage demonstration and increased the uncertainty in investment planning. In this situation storage pilots remain the opportunity for different stakeholders to work together and further improve methodologies that can apply to specific geological aspects of storage sites.

"Each site is unique and requires individual evaluation. European researchers are developing tools and sharing knowledge that will enable safe and reliable CO2 storage in Europe" explained Isabelle Czernichowski-Lauriol, President of CO2GeoNet and Coordinator of the CGS Europe project.

A new paradigm for CO2 storage public involvement was proposed by Samuela Vercelli, CO2GeoNet Executive Committee member: "People should not find themselves in the position to 'accept' a storage site. If given the possibility to identify and understand the advantages of storing CO2 and hosting a storage site they will have their own reasons for doing it. Instead of looking for public acceptance, dialogue should be sought. Storage pilots can be an excellent opportunity to experience a dialogue approach with the population".

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INDIAN POWER TIME TO DELIVER

6-8 MAY 2013, BOMBAY EXHIBITION CENTRE, GOREGAON, MUMBAI, INDIA



*Article in Carbon Capture Journal Newsletter based on the press release
on outcomes of the Open Forum 2013*

CGS Europe workshops with Italian UGIS science journalists

Rome - 8th October 2013

Milan - 11th October 2013



*Workshop in Rome - Samuela Vercelli and Salvatore Lombardi
(researchers of “La Sapienza” - University of Rome /CO2GeoNet-URS/)*

2.3 Workshops with Italian science journalists - Rome and Milan, October 2013

Two workshops with science journalists of the UGIS association (Italian Union of Science Journalists) were organised by CGS Europe Italian partners – CO₂GeoNet-URS and CO₂GeoNet-OGS. They took place in Rome on 8th October 2013 and Milan on 11th October 2013. The workshop in Milan was hosted by FAST (Federation of Scientific and Technical Associations) while the one in Rome was hosted by ENEA – Italian National Agency for New Technologies, Energy and Sustainable Economic Development, which also provided a key speaker on the capture part of CCS. The workshop in Rome had 29 participants (15 researchers and 14 communication people). The workshop in Milan had 29 participants (19 researchers and 5 communication people).



Workshop in Rome - Samuela Vercelli (researcher of “La Sapienza” - University of Rome /CO₂GeoNet-URS/) and Giovanni Anzidei (journalist and vice-president of UGIS)

The Rome workshop was introduced by the journalist Giovanni Anzidei (vice-president of UGIS) He introduced the CCS technology in and its implications for the environment and for climate change.

Samuela Vercelli (CO₂GeoNet-URS) spoke about the activities and objectives of the CGS Europe project and of CO₂GeoNet Network. Salvatore Lombardi” (CO₂GeoNet-URS) described the scientific principles and evidence on which CO₂ geological storage is based and the criteria that need to be considered for its safe implementation. He explained how CO₂ geological storage works and how we can monitor it.

Sergio Persoglia (CO₂GeoNet-OGS) illustrated case histories of CCS projects in Europe and the world and the implementation of CO₂ storage demos and pilots. He also explained the volume of CO₂ potentially stored by region or country and funding for demo projects.

The event also gave an opportunity to present an important Italian project of technological innovation in the sector, which can lead Italy at the forefront of engineering solutions for CCS: the CCS project Sulcis illustrated by Giuseppe Girardi (ENEA). Girardi also made a general introduction to capture and costs aspects of CCS.

The workshop ended with a reflection by Romualdo Gianoli, journalist of UGIS, about the maturity of the technology and its safety which, nevertheless, still requires dialogue and involvement of the population to explain how it works.

During the workshop, the participants were also invited to write their questions about CO₂ geological storage. This information was collected to gain a wider understanding about the participants' areas of interest and is now under elaboration for future events.

In Milan, the workshop followed the same order of presentations but it was introduced and chaired by Giovanni Caprara, president of UGIS.

During both workshops there was ample room for questions and discussion; a nice atmosphere where people exchanged freely was established. The workshops received appreciation from the participants for the open and frank approach and the real discussion of issues that took place.

The questions raised or the reflections proposed touched upon the following themes:

- How much, where and how can we store?
- Is transport safe?
- Environmental impacts around the storage site
- Seismicity issues
- Employment issues
- Long-term issues
- Regulatory schemes such as EIA
- Relationship with population, how to explain, how to avoid conflict
- Scale and kind of plants to which it can be applied
- Potential Italian sites, favourable geological conditions
- What are the existing initiatives?
- Technology which is difficult to imagine
- Uncertainty on whether doing storage is a worthwhile effort (bridging technology but with all the delays, does it still make sense?)
- Objections related to non- recognition of climate change
- Cost: evaluation of costs still not sufficiently concrete; possible economic advantages (?); cost in relation to other option at a system level not at the level of the single technology.

2.3.1 Rome workshop - List of participants

Cugno Marco	Progettista	Roma
D'addario Ezio Nicola	Presidente Gdl CCs	AIDIC . Monterotondo RM
Gianoli Romualdo	Giornalista	UGIS
Giordano Lorena	Ricercatore	Università degli studi dell'Aquila
Ranfagni Luca	Geologo	ARPAT Firenze
Santelli Fabrizio	Ingegnere	ATSST Roma
Tessitore Stefano	Geologo	ARPAT Firenze
Topazio Sonia	Giornalista	UGIS
Vaccarelli Maura	Dottoranda	Università degli studi di L'Aquila
Vannutelli Isabella	Giornalista	UGIS
Belsasso Fulvio	Giornalista	UGIS
Anzidei Giovanni	Giornalista	UGIS – Accademia dei Lincei
Apice Mario	Giornalista	UGIS – Ass.legambiente.com
Taglioni Alberto	Dirigente	A.T. SPA
Elisabetta Pasta	Capo ufficio stampa	ENEA
Maria Ludovica Bitonti	Addetta Stampa	ENEA
Roberto Deritis	Addetto stampa	ENEA
Patrizia Cecaro	Segreteria	ENEA
Laura Di Pietro	Addetto stampa	ENEA
Maccarrone Maria Teresa	Addetto stampa	ENEA
Refat Valerio	Giornalista	ENEA
Lombardi Salvatore	Professore	Università La Sapienza di Roma
Vercelli Samuela	Ricercatrice	Università La Sapienza di Roma
Battisti Nadia	Ricercatrice	Università La Sapienza di Roma
Modesti Federica	Giornalista	Università La Sapienza di Roma
Pirrotta Stefano	Ricercatore	Università La Sapienza di Roma
Colella Silvia	Ricercatrice	Università La Sapienza di Roma
Persoglia Sergio	Ricercatore	OGS
Girardi Giuseppe	Ingegnere	ENEA

2.3.2 Milan workshop - List of participants

Alimonti Gianluca	Ricercatore	INFN - Milano
Asquino Giuseppe	Quadro	ABB – Cologno Monzese (MI)
Bavestrelli Luciano	Partner	Decathlon Consulting - Milano
Beduschi Paplo	Docente	Univ. di Pavia - Pavia
Caratto Valentina	Vice Presidente	Green Modelling Italia – GMI (Spin-off Univ. degli Studi di Genova) - Genova
Casalone Paolo	Ricercatore	Monza (MB)
Fuselli Daniele	Direttore generale	Associazione Tecnologia, Scienza, Scuola, Società c/o ITI Cobianchi – Verbania
Gheza Stefano	Ricercatore	Borno (BS)
Mariani Mauro	Studente	Univ. Milano Bicocca – Desio (MB)
Maschio Giuseppe	Professore ordinario	Univ. di Padova - DII
Mazzoni Ottavio	Partner	Mazzoniconsulting - Milano
Nervi Carlo	Studente magistrale	Politecnico di Milano – Verdellino (BG)
Nicora Carlo	Consulente	Varese
Olivari Paola	Condirettore turismo d'affari	EDIMAN - Milano
Ottenziali Luca	Ricercatore	Brunate (CO)
Rigamonti Dario Scott	Ingegnere	Tethys - Milano
Sanguineti Elisa	Amministratore Delegato	GMI - Green Modelling Italia (Spin-off Univ. degli Studi di Genova)
Scotti Anna	Ricercatore T.D.	Politecnico di Milano
Sorgenti Rinaldo	vicepresidente	Assocarboni - Milano
Valtolina Daniele	DITC	SOL – Monza (MB)
Fiecchi Gabriella	Giornalista	UGIS
Majrani Alberto	Giornalista	UGIS
Pieri Alberto	Giornalista	UGIS
Giovanni Caprara	Giornalista	Presidente UGIS
Belsasso Fulvio	Giornalista	UGIS
Vercelli Samuela	Ricercatrice	Università La Sapienza di Roma
Lombardi Salvatore	Professore	Università La Sapienza di Roma
Persoglia Sergio	Ricercatore	OGS
Girardi Giuseppe	Ingegnere	ENEA



Workshop in Rome - Samuela Vercelli (researcher of “La Sapienza” - University of Rome /CO2GeoNet-URS/) and Romualdo Gianoli (journalist of UGIS)

2.3.3 The agenda



con la collaborazione di



Lo stoccaggio geologico della CO₂

**I ricercatori di CO₂GeoNet – CGS Europe
incontrano i giornalisti scientifici italiani di UGIS**

8 ottobre 2013 - Enea, via Thaon de Revel 76, Roma
11 ottobre 2013 - Fast, p.le R. Morandi 2, Milano

Agenda

- 09.15 Registrazione dei partecipanti
- 10.00 Saluto ai partecipanti e introduzione ai lavori
Giovanni Anzidei, UGIS
- 10.15 Interventi:
 - . CO₂GeoNet e CGS Europe: l'attività e gli obiettivi
Samuela Vercelli, Università di Roma "La Sapienza" – CERI
 - . Principi e criteri di sicurezza della CCS
Salvatore Lombardi, Università di Roma "La Sapienza" – CERI
 - . Casi concreti dell'applicazione della CCS in Europa e nel mondo
Sergio Persoglia, OGS
 - . Principi e costi delle tecnologie per la cattura della CO₂
Giuseppe Girardi, Enea
- 12.00 Dibattito
- 12.45 Considerazioni finali
Romualdo Gianoli, UGIS
- 13.00 Chiusura del seminario

2.3.4 Press releases

Two press releases were devoted to the Italian workshops with Journalists. The first one was released before the event, and it was published on the websites of UGIS/EUSJA and FAST. The second one was released after the event and was published on the Italian part of the CGS Europe website, CERI-University of Rome Sapienza website, ENEA website and also in ENEA newsletter, on UGIS and FAST websites, and websites www.donnecultura.eu and www.sicurezzaonline.it.

 <p>con la collaborazione di</p> <p>Lo stoccaggio geologico della CO₂</p> <p>seminario</p> <p>8 ottobre 2013 - Enea, via Thaon de Revel 76, Roma 11 ottobre 2013 - Fast, p.le R. Morandi 2, Milano</p> <p>Presentazione</p> <p>Lo stoccaggio geologico della CO₂ (CCS-CO₂ Geological Storage), cioè l'iniezione dell'anidride carbonica prodotta dalle attività industriali in strati geologici profondi, viene riconosciuto nella Roadmap europea al 2050 come essenziale (assieme al risparmio energetico e all'adozione di fonti di energia rinnovabili) per ridurre le emissioni di CO₂ in atmosfera e contrastare l'aumento della temperatura a livello globale.</p> <p>Ugis ritiene dunque sia importante conoscere tali tecnologie, valutarne i costi, discutere i rischi e le opportunità che esse possono portare, illustrare le migliori esperienze internazionali, capire tempi e modalità della sua possibile applicazione in Italia. Volendo facilitare la partecipazione degli interessati, propone due edizioni dello stesso seminario da realizzare a Roma con la collaborazione dell'Enea e a Milano con la Fast.</p> <p>L'associazione scientifica CO₂GeoNet è il Network di eccellenza europea sullo stoccaggio geologico di CO₂. Attualmente è costituita da 18 istituti di ricerca pubblici attivi in 12 paesi comunitari e riunisce più di 350 ricercatori con le competenze multidisciplinari necessarie per affrontare tutti gli aspetti dell'immagazzinamento dell'anidride carbonica.</p> <p>Tale organizzazione ha, tra l'altro, promosso l'avvio del progetto CGS Europe, nel quale coordina i contributi sullo stoccaggio di ulteriori 17 istituti, portando a 28 il totale dei paesi coinvolti (24 Stati membri dell'Unione e quattro associati). Vi aderiscono per l'Italia l'OGS (Istituto nazionale di oceanografia e di geofisica sperimentale) e l'Università di Roma La Sapienza – Centro di ricerca CERI.</p> <p>Le attività di CO₂GeoNet comprendono la ricerca, la formazione, la consulenza scientifica, l'informazione e la comunicazione, attraverso le quali l'associazione svolge un ruolo fondamentale nel supportare un'applicazione efficiente e sicura di questa tecnologia.</p>	 <p>Comunicato Stampa 12 Ottobre 2013</p> <p>Cattura e stoccaggio della CO₂: un ponte tra scienza e informazione</p> <p>Enea – Roma, 8 Ottobre Fast – Milano, 11 Ottobre</p> <p>Lo stoccaggio geologico della CO₂ (CCS-CO₂ Geological Storage), cioè l'iniezione dell'anidride carbonica prodotta dalle attività industriali in strati geologici profondi, viene riconosciuto nella Roadmap europea al 2050 come essenziale (assieme al risparmio energetico e all'adozione di fonti di energia rinnovabili) per ridurre le emissioni di CO₂ in atmosfera e contrastare l'aumento della temperatura a livello globale. Lo sviluppo delle tecnologie CCS può offrire all'industria nazionale l'opportunità di svilupparsi e di competere nel settore delle grandi infrastrutture energetiche e dei processi industriali fortemente emettitori di CO₂.</p> <p>In questo settore dalle grandi potenzialità e dalle ricadute sociali ed economiche di grande impatto, la nascita di una sinergia tra il mondo della ricerca e il mondo dell'informazione è indispensabile. Ne sono espressione i seminari organizzati da UGIS, l'Unione Italiana Giornalisti Scientifici, in collaborazione con il progetto FP7 CGS Europe e CO₂GeoNet, il Network di Eccellenza Europeo sullo stoccaggio geologico di CO₂, di cui sono membri fondatori il gruppo multidisciplinare del Prof. Lombardi dell'Università La Sapienza di Roma – CERI e l'OGS, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale di Trieste, svoltisi a Roma presso Enea e alla Fast di Milano l'8 e l'11 ottobre scorso.</p> <p>Le caratteristiche di questa tecnologia, lo stato dell'arte a livello mondiale e il ruolo della comunità scientifica paneuropea CO₂GeoNet sono stati i temi centrali del dibattito. L'evento inoltre ha dato l'occasione per presentare un importante progetto italiano di innovazione tecnologica nel settore, che può portare l'Italia all'avanguardia nelle soluzioni impiantistiche per la CCS: il progetto CCS Sulcis illustrato dall'ing. Girardi dell'ENEA. Un'iniziativa che ha tutti i requisiti per poter essere sostenuta dalla Comunità Europea offrendo un contributo sostanziale per limitare drasticamente le emissioni di CO₂ prodotte da impianti termoelettrici alimentati a carbone, ed altre emissioni quali particolato, zolfo, ecc., riducendole quasi a zero.</p> <p>Ne hanno discusso Samuela Vercelli e Salvatore Lombardi del Centro di Ricerca CERI dell'Università "La Sapienza" di Roma, Sergio Persoglia, dell'Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (I.O.G.S.) di Trieste e Giuseppe Girardi dell'ENEA, coordinati dal vicepresidente dell'UGIS Giovanni Anzidei a Roma e dal presidente UGIS Giovanni Caprara a Milano.</p> <p>Contatti stampa: CERI - Università di Roma "La Sapienza" – Samuela Vercelli +39 347 26 29 388 e-mail samuela.vercelli@uniroma1.it Segreteria CO₂GeoNet - Sergio Persoglia: +39 329 26 07 303 e-mail: info@co2geonet.com</p>
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Press releases published before and after the Italian workshops with journalists



Screenshot of the UGIS/EUSJA website with news based on the press release announcing the workshop in Rome



Screenshot of the FAST website with CGS Europe workshops with journalists announced in the Calendar of events (based on the information provided in the press release)

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Agenzia nazionale per le nuove tecnologie, l'energia
e lo sviluppo economico sostenibile

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Una collaborazione tra ricercatori e mondo dell'informazione per la cattura e lo stoccaggio della CO₂

14 ottobre 2013



Lo stoccaggio geologico della CO₂ (Carbon Capture and Storage - CCS), che consiste nell'iniettare in strati geologici profondi l'anidride carbonica prodotta dalle attività industriali, rappresenta nella Roadmap europea al 2050 uno dei fattori essenziali per ridurre le emissioni di CO₂ in atmosfera e contrastare l'aumento della temperatura a livello globale, insieme all'efficienza energetica e alle fonti rinnovabili. È una tecnologia che rappresenta il punto terminale della filiera CCS consistente nella cattura e separazione della CO₂ prodotta da processi industriali per il suo intrappolamento finale.

Lo sviluppo delle tecnologie CCS può offrire all'industria nazionale l'opportunità di svilupparsi e di competere nel settore delle grandi infrastrutture energetiche e dei processi industriali che emettono grandi quantità di CO₂, con grandi potenzialità sul piano delle ricadute sociali ed economiche.

Con l'obiettivo di favorire una maggiore conoscenza al grande pubblico delle tecnologie per lo stoccaggio geologico della CO₂, l'Unione giornalisti scientifici (UGIS), in collaborazione con il progetto FP7 CGS Europe e CO₂GeoNet, il Network di Eccellenza Europeo sullo stoccaggio geologico della CO₂, costituito da 34 istituti di ricerca attivi in 28 paesi comunitari e di cui sono membri fondatore il gruppo multidisciplinare del Prof. Salvatore Lombardi dell'Università di Roma "La Sapienza" - CE.RI, Centro Ricerca previsione, prevenzione e controllo dei Rischi geologici, e l'OGS, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale di Trieste, ha organizzato un primo seminario con il supporto e la partecipazione dell'ENEA per dare avvio ad una vera e propria collaborazione tra il mondo dei media e i gruppi di ricerca scientifica.

Il gruppo di ricercatori appartenenti a vari organismi scientifici italiani si è interfacciato con i giornalisti dell'UGIS, offrendo loro la possibilità di un aggiornamento professionale su queste tematiche. Hanno partecipato: Samuela Vercelli e Salvatore Lombardi dell'Università di Roma "La Sapienza"/CE.RI, Giuseppe Girardi dell'ENEA, Sergio Persoglia dell'OGS.

Le caratteristiche di questa tecnologia, l'illustrazione delle esperienze internazionali, il ruolo della comunità scientifica paneuropea CO₂GeoNet e la comprensione delle modalità di possibile applicazione in Italia sono stati i temi centrali del seminario. Il seminario inoltre è stato l'occasione per presentare un progetto italiano di innovazione tecnologica nel settore, il progetto CCS Sulcis, in Sardegna, illustrato dall'ing. Giuseppe Girardi dell'ENEA. Un'iniziativa che ha tutti i requisiti per poter essere sostenuta dalla Comunità Europea, ponendosi l'obiettivo di sviluppare, qualificare e rendere competitive sul piano economico soluzioni impiantistiche d'avanguardia sulla Carbon Capture and Storage, volte a limitare drasticamente le emissioni di della CO₂ prodotte da impianti termoelettrici alimentati a carbone, ed altre emissioni quali particolato, zolfo, ecc., riducendole quasi a zero.



*Screenshot of the article on ENEA website based on the press release
on outcomes of the workshop in Rome*

NEWSLETTER

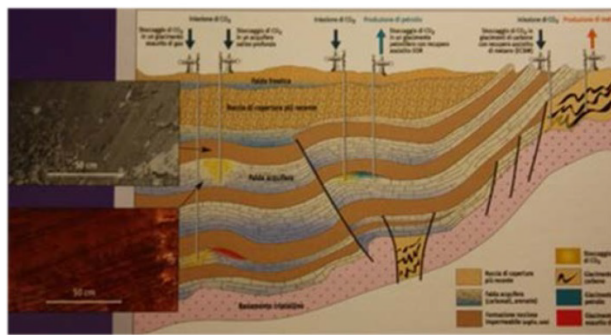
dell'Ufficio Stampa e Rapporti con i Media ENEA

Numero 7 – Ottobre 2013

Una collaborazione tra ricercatori e mondo dell'informazione per la cattura e lo stoccaggio della CO₂

Lo stoccaggio geologico dell'anidride carbonica (Carbon Capture and Storage - CCS), che consiste nell'iniettare in strati geologici profondi le emissioni climalteranti di CO₂ prodotte dalle attività industriali, rappresenta uno dei punti essenziali, insieme allo sviluppo dell'efficienza energetica e delle fonti rinnovabili, della Roadmap europea al 2050 per contrastare l'aumento delle temperature a livello globale. Lo sviluppo delle tecnologie CCS può offrire all'industria italiana l'opportunità di svilupparsi e di competere nel settore delle grandi infrastrutture energetiche e dei processi industriali che emettono grandi quantità di CO₂, con grandi potenzialità sul piano delle ricadute sociali ed economiche.

Con l'obiettivo di migliorare la comunicazione verso il grande pubblico delle tecnologie CCS, l'Unione giornalisti scientifici (UGIS) ha organizzato un seminario, con il supporto e la partecipazione dell'ENEA, durante il quale ricercatori dell'Università "La Sapienza" - CE.RI



(Centro Ricerca previsione, prevenzione e controllo dei Rischi geologici), dell'ENEA e dell'OGS (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale di Trieste) si sono confrontati con i giornalisti dell'UGIS, offrendo loro la possibilità di un aggiornamento professionale su queste tematiche.

Il seminario è stato inoltre l'occasione per presentare il "**progetto integrato Sulcis**", elaborato in Sardegna da Sotacarbo in stretta collaborazione con ENEA, che si configura come una grande iniziativa di innovazione tecnologica per l'Italia. In una terra afflitta da problemi occupazionali conseguenti alla chiusura delle miniere di carbone, questo progetto propone di realizzare una centrale termoelettrica a carbone, dotata di impianti per la cattura e il confinamento della CO₂ prodotta: una volta "intrappolata" mediante trattamenti di separazione dai gas combustibili prima del loro scarico al camino, attraverso un processo di disidratazione e compressione volto a trasformarla in un fluido denso che occupa molto meno spazio della forma gassosa, l'anidride carbonica sarebbe pompata mediante iniezione in giacimenti acquiferi e strati di carbone a profondità fra 800 e 1.000 metri.

Per maggiori informazioni

[Le parole dell'energia \(CCS\)](#)

[Progetto Sulcis](#)

*Article in ENEA Newsletter based on the press release on outcomes
of the workshop in Rome*

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RIDURRE LA CO2. UN'OPPORTUNITÀ PER L'ITALIA; SPERIAMO DI NON "PERDERE IL TRENO".

25 ottobre 2013 · by Art · in ECOLOGIA, salviamo il pianeta

TECNICHE PER RIDURRE LA CO2

Esperti a confronto a Roma e Milano.

Lo stoccaggio geologico della CO2, cioè l'iniezione dell'anidride carbonica prodotta dalle attività industriali in strati geologici profondi, viene riconosciuto quale strumento innovativo e strategico in chiave internazionale per ridurre le emissioni di anidride carbonica in atmosfera e contribuire a contrastare l'aumento della temperatura a livello globale.

Screenshot of the article published at www.donnecultura.eu

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17 OTTOBRE 2013

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17/10/2013 Una collaborazione tra ricercatori e mondo dell'informazione per la cattura e lo stoccaggio della CO2

Lo stoccaggio geologico della CO2 (Carbon Capture and Storage - CCS), che consiste nell'iniettare in strati geologici profondi l'anidride carbonica prodotta dalle attività industriali, rappresenta nella Roadmap europea al 2050 uno dei fattori essenziali per ridurre le emissioni di CO2 in atmosfera e contrastare l'aumento della temperatura a livello globale, insieme all'efficienza energetica e alle fonti rinnovabili. È una tecnologia che rappresenta il punto terminale della filiera CCS consistente nella cattura e separazione della CO2 prodotta da processi industriali per il suo intrappolamento finale.

Lo sviluppo delle tecnologie CCS può offrire all'industria nazionale l'opportunità di svilupparsi e di competere nel settore delle grandi infrastrutture energetiche e dei processi industriali che emettono grandi quantità di CO2, con grandi potenzialità sul piano delle ricadute sociali ed economiche.

Con l'obiettivo di favorire una maggiore conoscenza al grande pubblico delle tecnologie per lo stoccaggio geologico della CO2, l'Unione giornalisti scientifici (UGIS), in collaborazione con il progetto FP7 CGS Europe e CO2GeoNet, il Network di Eccellenza Europeo sullo stoccaggio geologico della CO2, costituito da 34 istituti di ricerca attivi in 28 paesi comunitari e di cui sono membri fondatore il gruppo multidisciplinare del Prof. Salvatore Lombardi dell'Università di Roma "La Sapienza" - CE.RI, Centro Ricerca previsione, prevenzione e controllo dei Rischi geologici, e l'OGS, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale di Trieste, ha organizzato un primo seminario con il supporto e la partecipazione dell'ENEA per dare avvio ad una vera e propria collaborazione tra il mondo dei media e i gruppi di ricerca scientifica.

Il gruppo di ricercatori appartenenti a vari organismi scientifici italiani si è interfacciato con i giornalisti dell'UGIS, offrendo loro la possibilità di un aggiornamento professionale su queste tematiche. Hanno partecipato: Samuela Vercelli e Salvatore Lombardi dell'Università di Roma "La Sapienza"/CE.RI, Giuseppe Girardi dell'ENEA, Sergio Persoglia dell'OGS.

Le caratteristiche di questa tecnologia, l'illustrazione delle esperienze internazionali, il ruolo della comunità scientifica paneuropea CO2GeoNet e la comprensione delle modalità di possibile applicazione in Italia sono stati i temi centrali del seminario. Il seminario inoltre è stato l'occasione per presentare un progetto italiano di innovazione tecnologica nel settore, il progetto CCS Sulcis, in Sardegna, illustrato dall'ing. Giuseppe Girardi dell'ENEA. Un'iniziativa che ha tutti i requisiti per poter essere sostenuta dalla Comunità Europea, ponendosi l'obiettivo di sviluppare, qualificare e rendere competitive sul piano economico soluzioni impiantistiche d'avanguardia sulla Carbon Capture and Storage, volte a limitare drasticamente le emissioni di CO2 prodotte da impianti termoelettrici alimentati a carbone, ed altre emissioni quali particolato, zolfo, ecc., riducendole quasi a zero.

Fonte: ENEA

Screenshot of the article published at <http://www.sicurezzaonline.it>

2.3.5 Echoes of Rome and Milan workshops

Il Galileo

The article "*Nascondere la CO₂ sotto terra. Un progetto Europeo per scongiurare i cambiamenti climatici* (Hiding CO₂ underground. A European project to combat climate change)" was published in "Il Galileo", a web scientific magazine (www.ilgalileo.eu), on 3 November 2013. The article is based on the participation of the journalist – Isabella Vannutelli - in the UGIS/EUSJA workshop in Rome. The article is available online at <http://www.ilgalileo.eu/n22/vannutelli.html>

Micron

The article "*Il progetto Sulcis e lo stoccaggio geologico della CO₂*" (The Sulcis Project and Geological Storage of CO₂) was published in the "MICRON" magazine in December 2013. The article is based on the participation of the journalist – Romualdo Gianoli - in the UGIS/EUSJA workshop in Rome. The magazine is published by ARPA Umbria, the Regional Environment Protection Agency, in both printed (1,500 copies) and electronic versions. The article is available online at <http://www.arpa.umbria.it/pagine/anno-2013>.



Screenshot of the title page of the article published at www.ilgalileo.eu





2.4 Workshop with French science journalists – Paris, October 2013

A workshop with science journalists of the French associations of Scientific and Environmental Journalists, AJE (l'Association des Journalistes de l'Environnement) and AJSPI (l'Association des journalistes scientifiques de la presse d'information) took place in Paris on 15th October 2013. It was prepared and lead by CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM and Samuela Vercelli of CO₂GeoNet-URS and with the participation of Dominique Durand (CO₂GeoNet – IRIS), Hervé Quinquis (CO₂GeoNet – IFPEN) and Rob Arts (CO₂GeoNet – TNO). The workshop was co-organised by Valéry Laramée (President AJE) and Sylvestre Huet (President AJSPI).

The workshop was introduced by Valéry Laramée, Sylvestre Huet and Samuela Vercelli. Then Rob Arts made a presentation on the geological storage of CO₂, what it is and how it works, followed by presentations by Isabelle Czernichowski on the recent CGS developments in Europe and by Hervé Quinquis on recent developments in France. The last presentation by Dominique Durand covered the topics of CO₂ geological storage worldwide and the role of CO₂GeoNet. All presentations were followed by question time and an extensive discussion took place at the end. The main topics covered by the questions and during the discussion were:

- Microseismicity
- Differences in the performance of seismic methods depending on the characteristics of the underground
- Cost of storage, also in terms of energy penalty
- Storage in depleted gas reservoirs
- ISO standards
- Possibility of retrieval of CO₂ from the storage reservoir
- CO₂ purity and how it is purified
- Risks, leakage
- How long it takes to fill up a reservoir, how do we understand whether it is full?
- Capacity
- Long term liability, financial provisions
- Scientific expertise, vested interests
- Research funding
- How many projects are on-going?
- Why is CCS not going ahead?
- Can it be also applied to existing plants?

2.4.1 The agenda

INVITATION

Atelier CGS Europe / CO₂GeoNet
 en collaboration avec l'Association des Journalistes de l'Environnement (AJE) et
 l'Association des Journalistes Scientifiques de la Presse d'Information (AJSPI)

ETAT DES LIEUX SUR LE STOCKAGE GEOLOGIQUE DU CO₂ EN EUROPE

Paris, Institut des sciences de la communication du CNRS
 (Rez-de-chaussée / Salle de conférence)
 15 Octobre 2013, de 13h30 à 18h

Contexte :

- Débat actuel sur l'avenir du captage et stockage du CO₂ (CSC) en Europe : communication consultative de la Commission européenne, préparation d'un rapport par le Parlement européen.
- Consolidation de la communauté scientifique européenne sur le stockage de CO₂ :
 - o Bilan du projet 7^{ème} PCRD CGS Europe qui se termine fin octobre,
 - o Développement de l'Association CO₂GeoNet, réseau d'excellence européen sur le stockage géologique de CO₂, dans la lignée de la nouvelle stratégie adoptée et grâce à l'intégration de nouveaux membres venus de CGS Europe.

Objectif : Sensibilisation, information et dialogue sur le stockage géologique de CO₂

Programme prévisionnel :

13.30 – 14.00 Accueil café

14.00 – 14.15 Introduction à l'atelier

- Samuela Vercelli, CO₂GeoNet-Université de Rome, Italie
- Valéry Laramée, Président de l'AJE
- Sylvestre Huet, Président de l'AJSPI

14.15 – 14.45 Que signifie vraiment le stockage géologique de CO₂ ?

- 14.15 : Intervention de Rob Arts, CO₂GeoNet-TNO, Pays-Bas
- 14 :30 : Questions

15.30 – 16.00 **Les récents développements en France**

- 15:30 : Intervention d'Hervé Quinquis, CO₂GeoNet-IFPEN, France
- 15:45 : Questions

16.00 – 16.30 **Les perspectives dans le monde et le rôle de l'Association CO₂GeoNet**

- 16:00 : Intervention de Dominique Durand, CO₂GeoNet-IRIS, Norvège
- 16:30 : Questions

16.30 – 17.15 **Discussion**

17.15 – 17.30 **Conclusion**

- Samuela Vercelli, CO₂GeoNet-Université de Rome, Italie
- Valérie Laramée, Président de l'AJE
- Sylvestre Huet, Président de l'AJSPI
- Isabelle Czernichowski-Lauriol, Présidente de CO₂GeoNet, Coordinatrice de CGS Europe

17.30 – 19.00 **Cocktail**

Contacts Presse :

Secrétariat CO₂GeoNet: Sergio Persaglio: +39 029 28 07 888 / info@co2geonet.com

Franco: Mathilde Follot, HBI + Knowledge Strategies: +33 1 41 06 44 37 / mathilde.follot@knowledgestrategies.com

2.4.2 List of participating journalists

Nom	Prénom	Organisation	Membre AJE	Membre AJSPI
Aurias	Aline	pigiste		x
Becu	Elodie	Egrapresse	x	
Bellin	Isabelle	Freelance		x
Cygler	Marine	journaliste indépendante		x
DESIR	Wesner	Collectif Haïtien des Journalistes Scientifiques et d'Investigation(COHAJSci)		
Devillaine	Valérie	pigiste		x
Forestier	Marine	AEF DD		
Gambet	Aude	EBRA	x	
Gruszow	Sylvie	Freelance		x
Huet	Sylvestre	Libération		x
Joseph	Anais	ajspi		x
Laramée de Tannenberg	Valery	Journal de l'Environnement	x	
LATRON	Patrice	LOOK AT SCIENCES		x
Lefevre	Pierre	Journaliste indépendant		x
Maincent	Guillaume	Enerpresse	x	
MEUVRET	Odile	Freelance	x	
MIKIDACHE	HOUMI	L'INQUISITEUR	x	
Varrault	Richard	waternunc.com	x	
Verhaegue	Laure	Valeurs Vertes	x	

2.4.3 Echoes of the Paris workshop

The article “*Stockage géologique du carbone: une technique en voie d'enterrement?* (CO₂ geological storage: a technology being buried?)” was published in “Le journal de l'environnement” on 16 October 2013. The article is based on journalist's participation in the Paris Workshop with journalists. The article is available online at <http://www.journaldelenvironnement.net/article/stockage-geologique-du-carbone-une-technique-en-voie-d-enterrement,37846>

The screenshot shows the homepage of the 'Journal de l'environnement' website. At the top, there is a search bar with the placeholder text 'Saisissez votre recherche' and a 'RECHERCHER' button. Below the search bar is a navigation menu with links: ACCUEIL, AIR, EAU, DÉCHETS, CLIMAT, RISQUES & SANTÉ, SITES & SOLS, ENERGIE, and POLITIQUE & SOCIÉTÉ. A banner for 'TPME TOUT POUR MON ENTREPRISE' is visible, with a button 'EN SAVOIR +'. The main article is titled 'Stockage géologique du carbone: une technique en voie d'enterrement?' and is dated 'Le 16 octobre 2013 par Valéry Laramée de Tannenberg'. It includes a photo of an industrial site with the caption 'Extraction de pétrole boostée par une injection de CO₂ DR'. The article text discusses the geological storage of CO₂ as a solution to climate change, mentioning the Paris Agreement and the need for a transition to a low-carbon economy. A sidebar on the right contains a 'Double liaison' advertisement, a section for 'OFFRES D'ABONNEMENT' (subscriptions), and a 'VEILLE REGLEMENTAIRE' (regulatory watch) section with links to various articles.

Journal de l'environnement

Saisissez votre recherche **RECHERCHER**

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Stockage géologique du carbone: une technique en voie d'enterrement?

Le 16 octobre 2013 par Valéry Laramée de Tannenberg

► Sites & Sols, Sites et sols Industriels, Energie, Energies thermiques, Gaz à effet de serre, Adaptation, Politique climatique, Politique & Société, Recherche, Entreprises, Climat

 Extraction de pétrole boostée par une injection de CO₂ DR

Le stockage géologique du CO₂ est au fond du trou. Peu de techniques peuvent pourtant se prévaloir d'autant d'*a priori* favorables pour lutter contre les changements climatiques. Cette palette de technologies permet, en effet, après avoir ôté le gaz carbonique des effluents gazeux industriels, de le transporter et surtout de l'injecter dans des structures géologiques étanches et profondes. Une façon d'assurer une transition entre le monde avide d'énergies fossiles, dans lequel nous vivons, et le futur décarboné, promis pour 2050. «*Dans tous les scénarios énergétiques, le stockage géologique du carbone est l'une des principales solutions retenues avec les énergies renouvelables et la réduction de la consommation*», rappelle Rob Arts de TNO, le CNRS néerlandais.

Dans son **rapport spécial de 2005**, le Groupe intergouvernemental d'experts sur l'évolution du climat (Giec) estime que le captage-stockage géologique de carbone (CSC) est susceptible de nous débarrasser de 21% à 45% des émissions industrielles de dioxyde de carbone... en 2050. Suffisant pour ouvrir les vannes de l'argent public et susciter l'intérêt des chercheurs de par le monde.

LA FRANCE PEUT STOCKER 72 ANS D'ÉMISSIONS

L'Europe n'a pas attendu l'audit international. Les premiers travaux de recherche débutent en 1993, dans le cadre du troisième programme-cadre de recherche et développement (PCRD). Ils donneront lieu aux premiers essais d'injection de CO₂ dans le sous-sol, à Sleipner, en mer du Nord norvégienne. En France, pas moins de 46 projets ont été conduits depuis 2005. Ils ont permis de caractériser les capacités de stockage de la géologie hexagonale (on pourrait y injecter plus de 26 milliards de tonnes de CO₂, soit l'équivalent de 72 années d'émissions des Français [1]), d'affiner les techniques de contrôle du sous-sol ou de préparer de grands projets, comme Ulcos.

Les industriels n'ont pas été en reste. Sur fonds propres, Total a développé et exploité, à Lacq, la première chaîne intégrée, comprenant une chaudière à oxycombustion, un système de captage du gaz carbonique et un «carbonduc», chargé de transporter quelques dizaines de milliers de tonnes de gaz carbonique vers un ancien réservoir souterrain de gaz naturel, situé sous les vignobles de Jurançon.

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Screenshot of the article in Journal de l'environnement

2.5 Interviews with researchers

La Croix - France

In March 2012, CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM gave an interview to La Croix, a daily French general-interest Roman Catholic newspaper published in Paris and distributed throughout the country, with a circulation of about 93,500. The interview was used in the article “*Stocker le CO₂, une solution d'avenir pour le climat?* (CO₂ storage, a promising solution for the climate?)” that was published on 27 March 2012.





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 Site Web : <http://www.le-croix.com>

ENQUÊTE Le captage – et stockage – du CO₂ est l'une des pistes explorées pour limiter nos émissions de gaz à effet de serre. Le point sur sa faisabilité technique et économique

Stocker le CO₂, une solution d'avenir pour le climat ?



M. LAMBERT/AGF/STUDIO 10

et minières), qui promeut en France cette technologie.

« Nous sommes très satisfaits du fonctionnement de l'ensemble du dispositif », assure Jacques Morine, chef du projet de Lacq (Pyrénées-Atlantiques). Depuis janvier 2010, Total a équipé l'une des chaudières de la centrale à gaz de son site d'un équipement de captage du CO₂ par oxycombustion. Le CO₂ ainsi récupéré est transporté par un pipeline de 27 km,

La technologie dite « CSC » pourrait contribuer pour 20 % à la réduction de nos émissions de gaz carbonique d'ici à 2050.

pour être stocké dans un réservoir de gaz naturel aujourd'hui épuisé. « Nous avons atteint cette année un rythme de crémation d'injection moyen de 100 tonnes de CO₂ par jour, assure Jacques Morine. La technologie est maîtrisée et le comportement du gaz, une fois stocké en sous-sol, est tout à fait conforme à nos modélisations. »

Malgré des résultats techniques encourageants, la filière CSC semble pourtant marquer le pas. Les projets

Les projets de recherche en technologie de capture et de stockage de CO₂ (CSC) ont du mal à voir le jour.

Pour lutter contre le réchauffement climatique, il n'y a pas que l'éolien, le solaire ou les économies d'énergie. Certains préconisent aussi le captage et le stockage géologique du CO₂, le principal gaz à effet de serre, émis par la combustion des énergies fossiles. Pour l'Agence internationale de l'énergie, cette technologie dite « CSC » pourrait même contribuer pour 20 % à la réduction de nos émissions de gaz carbonique d'ici à 2050, autant que les énergies renouvelables.

Aussi compliqué que cela puisse paraître, capter le CO₂ dans les cheminées d'une ou

de centrales, le transporter dans des pipelines et l'injecter à 1 000 mètres de profondeur... on sait faire. Statu quo pratique même l'opération à grande échelle en Norvège depuis 1996 sur le site d'exploitation de gaz naturel de Sleipner. Au lieu de relâcher dans l'atmosphère le CO₂ séparé du gaz exploité, on le stocke désormais sous la mer à raison de 1 million de tonnes par an. Même chose sur le site de Weyburn au Canada ou d'In Salah, en Algérie. « Normalement les installations de dimension industrielle, il existe des pilotes de petite taille au Japon, aux États-Unis, en Allemagne, en Australie et en France, opéré par Total sur son site de Lacq », rappelle Isabelle Czernichowski, en charge du dossier au BRGM (bureau de recherches géologiques

ont de la peine à voir le jour. « Même si les acteurs sont toujours très mobilisés, il y a eu beaucoup d'effets d'annonce ces dernières années, qui ne sont pas toujours nés d'effet », confirme Nathalie Thybaud, en charge du dossier à l'Ademe. En cause ? Le surcoût de cette technologie. « Quelle que soit la technique employée, les coûts de captage restent élevés, confirme Dominique Copin, coordinateur captage et stockage de CO₂ chez Total. De ce fait, les conditions économiques ne sont pas favorables aujourd'hui pour les acteurs industriels. » Faute de résultats spectaculaires dans les négociations internationales, la pénalité pour émettre du CO₂ est incertaine... ou très faible. ■■■

(Lire la suite page 20.)

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CO₂ storage, a promising solution for the climate? - title page of the article in the La Croix newspaper

52

Energetika.net - Croatia

In July 2012, Bruno Saftic of University of Zagreb (UNIZG-RGNF) gave an interview to Energetika-net, a Croatian online magazine, with a circulation of about 6000 copies. The interview was used in the article “O ekonomici gradnje TE Plomin C odlučivat će cijena ‘toplog zraka’ (Economics of the new Thermal Power Plants will be governed by the price of ‘hot air’)” that was published on 12 July 2012

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O ekonomici gradnje TE Plomin C odlučivat će cijena "toplog zraka"

Rastuće financijske obaveze oko elektrana koje emitiraju velike količine ugljičnog dioksida, kao što je TE Plomin, bit će jedan od čimbenika o kojima će investitor u TE Plomin C voditi računa. Trenutačne demo-tehnologije pokazuju da tek cijena od 70 EUR/t emitiranog CO₂ čini CCS-sustave isplativima. Europska proizvodnja energije do 2050. godine treba postati ugljično neutralna - hoće li termoelekttranama na ugljen biti potrebna pomoć države i koliko će tako proizvedena struja koštati?

Objavljeno: 12.07.2012. - 13:19
Autor: Nina Domazet

Tagovi:
TE Plomin, HEP, ugljični dioksid, RWWE, ugljen

Jedan od odlučujućih faktora pri odlučivanju u investiranje u gradnju TE Plomin C na ugljen snage 500 MW bit će i procjene isplativosti tog objekta kroz perspektivu budućeg kretanja cijena emisijskih jedinica za ugljični dioksid. Kretanje cijene emisijskih kvota i buduća politika oko klimatskih promjena uvelike će odrediti budućnost i ekonomiku termoelekttrana na ugljen, kao baznih objekata koji se u Europskoj uniji gotovo više uopće ne grade i koji bi u perspektivi idućih 30-ak godina pod pritiskom velikih investicija u zaštitu okoliša mogli postupno prestati s radom. Pred HEP-om su već sada velike financijske obaveze koje se u javnosti uglavnom ne spominju, a iako je riječ o važnoj temi, u HEP-u o tom aspektu investicije u TE Plomin C ipak nismo uspjeli dobiti sugovornika.

Ulaskom Hrvatske u EU i priključenjem na Europski sustav trgovanja emisijskim jedinicama (EU-ETS), HEP će imati obavezu kupovanja emisijske kvote za svaku emitiranu tonu CO₂. Treće razdoblje trgovanja emisijskim kvotama počinje 2013. i traje do 2020. godine. HEP će, počevši od 1. siječnja 2013. do 30. travnja svake tekuće godine morati kupovati ukupni iznos kvota za pokrivanje emisija za prethodnu godinu. HEP približno emitira oko 5 milijuna t CO₂ godišnje. Godišnji HEP-ov izdatak za kupovinu emisijskih kvota, ovisno o količini emisija i cijeni CO₂ na tržištu, procjenjuje se na 50 - 75 mil. eura. Taj iznos može biti smanjen za približno 20%, odnosno za emisije CO₂ koje se ispuštaju pri proizvodnji toplinske energije, ako se prihvate HEP-ovi zahtjevi za izuzećem termoelektranih postrojenja. Uštede za HEP zbog dobivanja besplatnih emisijskih jedinica iznosit će 10 -

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*Economics of the new Thermal Power Plants will be governed by the price of ‘hot air’
- title page of the article in the Energetika-net Croatian online magazine*

Czech Radio Leonardo - Czech Republic

In October 2012, Vit Hladik of CzGS gave a one-hour public lecture on CO₂ geological storage within the Science and Technology Week 2012 organised by the Czech Academy of Science. The title of the lecture was “Co s oxidem uhličitým? Uložit pod zem! (What to do with carbon dioxide? Bury underground!)”; the lecture was visited by several science journalists. Following the lecture, V. Hladik gave a 15-minutes interview on CCS and CO₂ storage to a reporter of the Czech Radio – Leonardo, a countrywide radio channel focusing on popularization of science, technology, nature, history and medicine.

The interview was broadcasted on 24 January 2013 within the “Natura” radio magazine about animate and inanimate nature under the title “Carbon dioxide underground!”. The interview is available online at <http://prehravac.rozhlas.cz/audio/2814840>.

Le Monde - France

In April 2013, CGS Europe project co-ordinator Isabelle Czernichowski-Lauriol of BRGM gave an interview to Le Monde, the main French newspaper with a circulation of about 350,000 printed copies every day. It has also e-version online that - with over 40 million visits monthly - is the number-one news website in French. The interview was used in the article “L'Europe veut accélérer l'enfouissement du CO₂ (Europe wants to accelerate CO₂ underground storage)” that was published on 4 April 2013. The article has also online version that is available at http://www.lemonde.fr/planete/article/2013/04/03/l-europe-veut-acceler-l-enfouissement-du-co2_3152532_3244.html

8 | **PLANÈTE**

fr. Monde
lundi 4 avril 2013

L'Europe veut accélérer l'enfouissement du CO₂

Bruxelles cherche à financer ce moyen de lutte contre le réchauffement, coûteux mais jugé prometteur

Le captage-stockage du CO₂, destiné à freiner le réchauffement, finira-t-il par sortir de terre? En dépit des difficultés rencontrées jusqu'ici, l'Union européenne veut relancer cette filière. Mercredi 3 avril, elle a ouvert un nouvel appel à projets, en exhortant les Vingt-Sept à « un déploiement rapide » d'une technologie « à la croisée des chemins ».

Dans tous les scénarios énergétiques pour les décennies à venir, le captage-stockage du CO₂ tient une place de choix. Pour limiter la hausse des températures globales à 2 °C – au-delà desquels la surchauffe de la planète deviendrait insoutenable –, les parades sont connues. Économies d'énergie. Promotion des renouvelables. Mais aussi séquestration du gaz carbonique, récupéré dans les fumées des usines ou des centrales thermiques, puis enfoui dans des formations géologiques profondes. Selon l'Agence internationale de l'énergie (AIE), 20 % des émissions humaines de CO₂ pourraient ainsi être soustraites de l'atmosphère en 2050.

Une chaîne de captage, de transport et de stockage de CO₂ se chiffre, pour les plus petites, en dizaines de millions d'euros

Si, du moins, la feuille de route du captage-stockage est tenue. Ce qui est aujourd'hui loin d'être le cas. Alors que l'AIE tablit sur une centaine de projets à grande échelle en 2020, il n'existe encore qu'une vingtaine de démonstrateurs dans le monde, dont huit seulement de taille industrielle : cinq aux États-Unis, deux en Norvège, le dernier en Algérie. Aucun sur le territoire de l'Union européenne.

Bruxelles avait pourtant préparé le terrain en lançant, en 2010, le programme NER300. Il s'agissait de cofinancer une douzaine de projets, à hauteur de 50 %, grâce à la

Tombé à 5 euros depuis, le cours du quota de CO₂ n'incite plus les industriels à « verdir » leurs installations en investissant dans des procédés très coûteux. Une chaîne de captage, de transport et de stockage se chiffre en dizaines de millions d'euros, en centaines de millions pour les plus grosses. Au final, la tonne de CO₂ stockée coûte à l'industriel entre 30 et 100 euros.

Mais l'Europe ne baisse pas les bras. Pour avancer vers « une économie bas carbone », le besoin de démonstrateurs est « plus urgent » que jamais, plaide la Commission. D'où l'ouverture, pour trois mois, d'un deuxième appel à projets dont les résultats sont attendus à la mi-2014. La simple reconduction de la cagnotte antérieure ne pourra toutefois subventionner qu'un petit nombre de projets. L'exécutif européen le sait. Il engage donc les États membres à explorer plusieurs pistes de financement. Notamment une réforme – aujourd'hui dans l'impasse – du marché communautaire du carbone. Et un nouveau dispositif de « certificats » de séquestration, que les industriels ayant investi dans le stockage pourraient monnayer comme les quotas d'émission de CO₂.

L'obligation, pour les nouvelles centrales à charbon et à gaz, d'être équipées de systèmes de captage-stockage, est aussi envisagée. Pour avancer plus vite, le réseau scientifique européen CO₂GeoNet, qui regroupe treize instituts de recherche publics de sept pays, plaide pour le lancement de « projets pilotes de stockage » plus petits – et donc moins onéreux – que les démonstrateurs à grande échelle. C'est cette solution que CO₂GeoNet poussera lors de son forum, du 9 au 11 avril à Venise.

« Une demi-douzaine de pilotes seraient nécessaires en Europe », estime la présidente du réseau, Isabelle Czernichowski-Lauriol, du Bureau de recherches géologiques et minières (BRGM) français. L'un d'eux, espère-t-elle, pourrait être situé dans le bassin sédimentaire parisien.

« Plus on aura de pilotes et mieux l'on pourra caractériser les aquifères salins profonds susceptibles d'emmagasiner du CO₂, sur le long terme, explique la chercheuse. Chaque site a des spécificités, en fonction des couches géologiques, des roches et des fluides présents, de l'existence de fractures ou de failles... »

L'essor de la filière se heurte à l'inquiétude des riverains face aux risques de remontée du gaz, dangereux à forte concentration

Le problème du financement n'est toutefois pas le seul frein qui entrave l'essor du captage-stockage. Celui-ci se heurte aussi à l'opposition des riverains, inquiets des risques de remontée brutale de CO₂, gaz acide et dangereux pour la santé à forte concentration, ou de pollution des nappes phréatiques par des métaux lourds toxiques qui pourraient libérer l'interaction du gaz carbonique avec la roche.

La Grande-Bretagne n'en a pas moins décidé, fin mars, de sélectionner deux projets, l'un en Écosse et l'autre en Angleterre, dans le cadre d'un programme de captage-stockage doté – sans subsides européens – de 1,1 milliard d'euros.

En France, Total a cessé, à la mi-mars, les injections de CO₂ dans le sous-sol de Lacq (Pyrénées-Atlantiques) où a été tentée, pendant trois ans, la première chaîne complète de capture, de transport et d'enfouissement. Le groupe pétrolier estime y avoir fait la démonstration de la « faisabilité technique » d'un procédé qui – une fois surmontés les obstacles de la rentabilité, de la réglementation et de « l'acceptabilité sociale » – deviendra, selon lui, indispensable à la lutte contre l'effet de serre. ■

Pierre La Hita

The newspaper article in Le Monde

Postimees - Estonia

The Estonian journalist Arko Olesk, science editor of the Postimees newspaper, participated in the CGS Europe knowledge-dissemination workshop in Espoo, Finland, in May 2013. On the basis of interviews with Sebastian Teir (VTT Technical Research Centre of Finland), Alla Šogenova (Institute of Geology at Tallinn University of Technology) and Ludmilla Basava-Reddi (IEA Greenhouse Gas R&D Programme), he published an article titled "CO₂ atmosfääri asemel maapöue (CO₂ into the earth's crust instead of the atmosphere)".

Postimees (www.postimees.ee, in English news.postimees.ee) is one of the two main daily newspapers in Estonia. It is printed on paper and published on-line. The article was published in the Arvamus (Opinion) section, and is available at <http://arvamus.postimees.ee/1255012/co2-atmosfaari-ase- mel-maapoue>

Postimees Ilm | E24 | Sport | Tarbija24 | Elu24 | Naine24 | Soov | Reporter | Kuku | Uuno | Elmar | Kanal2
Kultuurikava | Pärnu Postimees | Sakala | Virumaa Teataja | Järva Teataja | Valgamaalane

ARVAMUS

Tihti tehakse kirjanikule ettepanek «ah, kriba midagi», disainerile öeldakse, et «viska kiirelt mingi visand»; lauljale «tee paar lugu». Tasuta. Missioonitundest. Katrin Seppel

KARIKATUUR | JUHTKIRI | PÄEVAKOMM | TOIMETUS | AK | ARUANNE | EUROVÄITLUS | RAAMATUBLOGI

AK

CO2 atmosfääri asemel maapöue

02.06.2013 22:28
Arko Olesk, teadustoimetaja
Kommenteeri | Prindi

Kaugel ei pruugi olla päev, mil põlevkiviil töötavaist Narva elektrijaamadest ei pääse atmosfääri enam grammigi süsihappegaasi. Selle asemel voolab CO2 mööda torujuhet Lätti või viiakse laevaga keset Läänemerd ja maetakse sügavale maapöue. Ent see päev ei ole ka lähedal.

Paari nädala eest sai ületatud üks märkimisväärne rajajoon: süsihappegaasi kontsentratsioon atmosfääris kerkis üle 0,04 protsendi. See tühisena näiv osakaal ning veel tühisemana tunduv 0,012-protsendipunktiline kasv viimase 200 aasta jooksul on aga teadlaste hinnangul põhjustanud ulatuslikke muutusi kliimas ja ökosüsteemides.

Sestap on süsihappegaasi emissioonide vältimisest ja vähendamisest saanud üks domineerivaid globaalseid poliitikaeesmärke. Selle saavutamise nimel kerkivad tuulepargid, vuravad teedele elektriautod ja maju ehitatakse ümber energiatõhusaks. Ent täielikult süsinikuheitmetest vaba majandus ei ole võimalik, vähemalt lähematel aastakümnetel on oma roll veel ka põlevkivi- või söeelektrijaamadel ja maagaasil. Samuti on mitmeid energiamahukaid tööstusharusid, näiteks tsemendi- või terasetootmine, mille puhul ei olegi teistsuguseid, süsihappegaasi mitte tekitavaid lahendusi.

Nende puhul pakutakse lahendusena tehnoloogiaid, mille olemus on tekkiva süsihappegaasi püüdmine enne atmosfääri jõudmist ja selle ladestamine maapöue. «Süsiniku püüdmisel ja ladestamisel on suur potentsiaal, see võib hinnangute kohaselt anda viiendiku 2050. aastaks vajaminevatest süsinikukärbetest,» räägib Sebastian Teir, Soome uurimiskeskuse VTT teadlane.

JAAN MARTINSONI RAAMATUBLOGI

Otsi Arhiiv

VÄRSKEIMAD ARVAMUSED

- * 15:24 Reedel Sirbis: refleksioone Randjärve monograafia, kultuuriajakirjandusele, eesti kirjandusele tabud
- * 15:17 Raul Kalev: vähem õnneluid kassapidajaid
- * 15:10 Mart Saarso: see on ohu märk (1)
- * 15:09 Viktoria Korpan: maitse üle kakeldakse
- * 14:43 Reedel Õpetajate Lehes: teadusringist, erikoolidest, väikeklassidest
- * 13:15 Karmo Tüür: kellele on kasulik eurorevolutsioon Ukrainas? (1)
- * 12:11 Kas Ukraina ja Armeenia otsused näitavad idapartnerluse läbikukkumist? Tuleb online-väitlus! (1)
- * 12:07 Mait Raava: kuidas tõsta õpimotivatsiooni? (1)
- * 12:06 Mart Helme: järgmine peatus - Balti riigid (4)
- * 12:05 Juhtkiri: La Manche'i kohal on taas udu (2)

PÄEVA KARIKATUUR

Article in Postimees – Arvamus - electronic version

3. Publications in media with international outreach

3.1 Public Service



In the first project period, a strong and fruitful media relationship was established with Public Service, a UK-based publishing house. This cooperation was topped in the 2nd project period by two publications on CCS and CO₂ geological storage in the Public Service Review. The Public Service Review presents analyses of issues that crucially affect the public sector throughout Europe, including health, education, transport, science and the environment. It is distributed by name to almost 6,000 individuals within government departments, directorates and agencies in the regional and central governments of the 27 EU Member States. The Review engages, spreads and promotes Best Practice and identifies the ideas that could herald the next big breakthrough, and is a must-read for anyone interested or involved in Europe's public sector.

Public Service Review - European Science and Technology, issue 17, December 2012: 'Scratching beneath the subsurface'

The article written by Bruno Saftic (UNIZG-RGNF), the CGS Europe task leader for 'Publications and presentations' and reviewed by CGS Europe project partners, considers the untapped potential of CO₂ geological storage as a carbon reduction strategy. The article is also available online at <http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=95bcf7de-c43d-4e8a-abf4-6de7b4bbfaf5> (page 73).



Article in Public Service Review - European Science and Technology, issue 17 (December 2012)

Public Service Review - Europe, issue 25, March 2013: ‘Seeing is believing?’

The 3-page article is written by Nick Riley (CO₂GeoNet-BGS), chair of the CGS Europe General Assembly. It provides a geoscientist’s perspective on the potential of CCS, and reflects why policymakers may have been slow to act on CO₂ emissions. The article is also available online at

<http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=91933a15-6a2c-4788-aa83-4033db763663> (pages 370-372). The foreword of the issue was written by Martin Schulz, President of the European Parliament. The article is presented in Annex III to this report.

Banner – Public Service Europe Website

CGS Europe had a banner displayed on the Public Service Europe website (in the ‘Energy’ Policy Area) for one year (October 2011 to September 2012), with a link to the CGS Europe website. The PublicServiceEurope.com website aims to be the online knowledge hub for those wanting the inside track on European politics, public administration, management issues and key developments in the business world. From high-profile interviews with the key politicians and officials across the European Union to reports from the major summits and events, and in-depth coverage of supranational institutions - PublicServiceEurope.com provides a key resource for Brussels and beyond.

3.2 Global Scientia



A similar cooperation agreement to Public Service was also signed with Global Scientia, the provider of the globalscientia.com website and publisher of the Global Scientia journal, a world-leading independent review on global science and technology. The mission of Global Scientia is to help create a better understanding of the community of science and its possibilities through sharing ideas and thoughts and asking the right questions to the right people. The agreement included publication of two articles and display of the CGS Europe project banner on www.globalscientia.com.

Global Scientia, issue 2, September 2012: ‘CO₂GeoNet and CGS Europe: A European response to global climate change through CO₂ geological storage’

A 2-page article written by the CGS Europe co-ordinator Isabelle Czernichowski (BRGM) and reviewed by project partners explains the rationale and principles of CO₂ geological storage and the role CGS Europe and the CO₂GeoNet association play in European research on this topic. The article was accompanied by another page with fact sheets on CGS Europe and CO₂GeoNet, and the title page of the journal was devoted to CGS. A copy of the article is presented in Annex IV. The article is also available online at

<http://edition.pagesuite-professional.co.uk/launch.aspx?eid=6c66fb84-4b3c-4f7d-af0c-3fa6e890d5b1>. (pages 75-77).

Global Scientia, issue 3, April 2013: ‘CGS Europe and CO₂GeoNet — taste of European research networking’

A 4-page article by Vit Hladik (CzGS), leader of the Knowledge dissemination WP of CGS Europe, was devoted to the role international scientific networking in building research capacity and competence in “follower” countries, where the particular R&D topic is just emerging. This role was demonstrated by examples from the European research networking in the area of CCS. A copy of the article is presented in Annex III to this report. The article is also available online at

<http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=b7fcd5e1-fc78-476c-92ea-1ac054e345e3> (pages 82-85).

Banner – Global Scientia Website

CGS Europe has a banner displayed on the Global Scientia website with a link to the CGS Europe website. The globalscientia.com website is devoted to sharing ideas and thoughts coming from the science community. Besides major influencers of science, they also aim at the future of science and therefore students have the opportunity to promote their own interests and research. The website should act as a knowledge transfer portal linking in all of the different people involved in the scientific community and be an interactive forum of discussion.

3.3 Pan European Networks

A one-page profile titled ‘Joining forces – CGS Europe, a pan-European co-ordination action on the geological storage of CO₂’ was published in The Pan European Networks: Government journal, issue 3, in August 2012. The article was written by Isabelle Czernichowski-Lauriol (BRGM), CGS Europe project co-ordinator.

The journal showcases the latest political developments, policy changes and decisions that will impact at the operational level of local, regional, national and European government. This helps facilitate an easy dialogue between both the public and private sectors across Europe and in turn provides a platform in which leading figures from Europe can discuss and promote projects, funding opportunities, research, products and services.

PROFILE

Joining forces

CGS Europe, a pan-European co-ordination action on the geological storage of CO₂

The European Union has already made significant progress in advancing carbon capture and storage (CCS) as a bridging technology for combating climate change. The situation now calls for acceleration and an even spread throughout the EU member states and associated countries.

CGS Europe, a co-ordination action funded by the EU Seventh Framework Programme (November 2011 to October 2013), has been created to complement existing CCS initiatives and, more specifically, to tackle the part of the CCS chain dealing with scientific research on CO₂ geological storage across the whole of Europe.

The storage component of CCS requires particular attention because (i) it is site-specific due to local geology and (ii) its large-scale feasibility, in terms of capacity, efficiency and safety over thousands of years, remains to be fully proven.


CGS Europe pools together the expertise of 34 key research institutes in the area of CO₂ geological storage across 28 countries (24 European member states and four associated countries). The CGS Europe Consortium has grown from the initial nucleus and experience of the CO₂GeoNet Network of Excellence, initially an FP6 project (2004-2009), and now an independent association involving 13 founding institutes from seven countries.

The objective is to create a credible, independent and long-lasting pan-European scientific body of expertise to support widespread understanding of the technology and foster knowledge development and sharing. Durability after the end of the project will be ensured by the expansion of the membership of the CO₂GeoNet Association.

CGS Europe is dedicating a major effort to the management of scientific knowledge on CO₂ storage:


- The establishment of a knowledge repository to collect, structure and summarise key existing knowledge in a format that will be easily accessible by interested parties;
- Knowledge development involving identification of research needs, building of new projects, internal knowledge sharing workshops, and exchange of personnel;
- Knowledge dissemination including the annual CO₂GeoNet Open Forum, awareness-raising workshops in regions of low level of CCS awareness, CO₂ storage knowledge-dissemination workshops in countries where CCS demonstration projects are under preparation, 'spring schools', presentations and publications, and interaction with media.

Such a neutral European reference body on scientific matters has a key role to play to facilitate the large-scale demonstration and deployment of CCS and support the implementation of the EU directive on the geological storage of CO₂.



Map background: Europe geological map

Europe is preparing large-scale demonstration of CO₂ geological storage. Countries where the first CCS demonstration projects are under preparation are indicated, i.e. those co-funded from the European Economic Plan for Recovery and candidates to the NER300 call, as well as the 34 research institutes from 28 countries involved in CGS Europe.





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1 Pan European Networks: Government 03
www.paneuropeanetworks.com

*CGS Europe profile in Pan European Networks:
Government*

4. Press releases on key project reports

On 3 July 2013, a press release titled “State of play on geological storage of CO₂ in 28 European countries” was produced, highlighting a CGS Europe report describing current status of achievements in the area of CO₂ storage in individual European countries. The article was taken over by several CCS-related newsletters, like Greenhouse News, ZEP newsletter (of the Zero emission platform) or Carbon Capture Journal Newsletter. This press release was also published on CORDIS Wire on 4 July 2013 and in the Carbon Capture Journal No 35 (Sept/Oct 2013).

<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Press Release 3rd July 2013</p> <p style="text-align: center;">State of play on geological storage of CO₂ in 28 European countries</p> <p>The European Commission recently took the first step towards developing a 2030 framework for EU climate change and energy policies. The Commission also published a Consultative Communication on the future of CO₂ capture and storage (CCS) in Europe, aimed at initiating a debate on the options available to ensure its timely development. In parallel, The European Parliament is preparing a report on developing and applying CCS Technology in Europe.</p> <p>In this context, the report “State of play on CO₂ geological storage in 28 European countries”, published in the framework of the Pan-European Coordination Action on CO₂ Geological Storage (FP7 CGS Europe project), reflects the current situation and achievements regarding geological storage of CO₂ in the 28 European countries covered by CGS Europe.</p> <p>The report gives a brief overview of the CO₂ storage options, potentials and capacities in Europe. It summarizes information on research activities and organization of research funding related to CO₂ storage in each of the CGS Europe countries. Information on a national level is complemented by an overview of activities on a regional and European level. Current pilot, demo and test sites in the CGS Europe countries are listed, followed by an overview of the state of transposition of the EU Directive on the geological storage of CO₂ and the level of public awareness in the individual countries.</p> <p>For a Europe-wide comparison, a ranking is provided assessing the overall national achievements regarding CO₂ storage in the 28 European countries. The current level of CCS activities in European Countries varies widely between well advanced countries, such as Norway, and CCS-rejecting countries that have not even transposed the EU CCS Directive into national law. CGS Europe exchanges geo-technical knowledge between advanced and following countries in order to level the playing field and pave the way for the future deployment of CO₂ storage pilot and demonstration projects in Europe.</p> <p>This report is a valuable information pool for the current debate on the future CO₂ Capture and Storage in Europe. The CO₂GeoNet Association, the European network of excellence on CO₂ geological storage, in close connection with the CGS Europe FP7 project, here expresses the views of a pan-European consortium involving 34 research institutes from 24 EU Member States and 4 Associated Countries. As such representing the European scientific community on CO₂ Geological Storage (CGS), CO₂GeoNet and CGS Europe wish to share their expert input for the debate on taking CCS forward in Europe.</p> <p>The report is available at http://www.cgseurope.net/NewsData.aspx?IdNews=87&ViewType=Actual&IdType=478</p> <p><small>Press Contacts: CO₂GeoNet Secretariat - Sergio Persoglia; +39 329 26 07 303 email:info@co2geonet.com</small></p>	<p>About CO₂GeoNet CO₂GeoNet is the European scientific body on CO₂ geological storage. Founded by 13 public research institutes from 7 European countries, it 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. As of 2013, the membership of CO₂GeoNet is expanding thanks to the support of the FP7 CGS Europe project. More about CO₂GeoNet at www.co2geonet.eu</p> <p><small>CO₂GeoNet - 3 avenue Claude Guillemin, B.P. 36009, 45060 Orléans, France – Tel: +33 238 644655 Secretariat - Borgo Grotta Gigante, 42/C, 34016 Sgonico (TS), Italy - Tel: +39 040 2140229, Email: info@co2geonet.com</small></p> <p>Founding Members of CO₂GeoNet:</p> <table border="0"> <tr> <td>• GEUS (Denmark)</td> <td>• IRIS (Norway)</td> </tr> <tr> <td>• BRGM (France)</td> <td>• NIVA (Norway)</td> </tr> <tr> <td>• IFPEN (France)</td> <td>• SPR Sintef (Norway)</td> </tr> <tr> <td>• BGR (Germany)</td> <td>• BGS (UK)</td> </tr> <tr> <td>• OGS (Italy)</td> <td>• HWU (UK)</td> </tr> <tr> <td>• URS (Italy)</td> <td>• IMPERIAL (UK)</td> </tr> <tr> <td>• TNO (Netherlands)</td> <td></td> </tr> </table> <p>New Members of CO₂GeoNet:</p> <table border="0"> <tr> <td>• RBINS-GSB (Belgium)</td> <td>• GEO-INZ (Slovenia)</td> </tr> <tr> <td>• UNIZG-RGNF (Croatia)</td> <td>• S-IGME (Spain)</td> </tr> <tr> <td>• GFZ (Germany)</td> <td>• METU-PAL (Turkey)</td> </tr> </table> <p>About CGS Europe CGS Europe is a networking project (2010-2013) that pools together the expertise of 34 key research institutes in the topic of CO₂ geological storage across 28 countries (24 European member states and 4 associated countries). Funded by the EC FP7 programme, it builds upon the networking and integration experience of CO₂GeoNet with the ultimate goal of providing an independent, scientific, pan-European platform and reference source where national, European and international experts, institutes and regulators can access the most up-to-date results of CO₂ storage-related studies, share experiences and good practices, discuss the implementation of regulations, identify research needs to face upcoming challenges, and build new projects. After the end of the project in October 2013, all activities will be performed in the framework of the CO₂GeoNet Association, enlarged with new members from CGS Europe for a pan-European coverage</p> <p>More about CGS Europe at www.cgseurope.net</p> <p>CGS Europe partners:</p> <table border="0"> <tr> <td>• CO₂GeoNet</td> <td>• LEGMC (Latvia)</td> </tr> <tr> <td>• GBA (Austria)</td> <td>• GTC (Lithuania)</td> </tr> <tr> <td>• RBINS-GSB (Belgium)</td> <td>• PGI-NRI (Poland)</td> </tr> <tr> <td>• SU (Bulgaria)</td> <td>• LNEG (Portugal)</td> </tr> <tr> <td>• UNIZG-RGNF (Croatia)</td> <td>• GEOECOMAR (Romania)</td> </tr> <tr> <td>• CzGS (Czech Republic)</td> <td>• AGES (Serbia)</td> </tr> <tr> <td>• TTUGI (Estonia)</td> <td>• SGUDS (Slovakia)</td> </tr> <tr> <td>• GTK (Finland)</td> <td>• GEO-INZ (Slovenia)</td> </tr> <tr> <td>• G-IGME (Greece)</td> <td>• S-IGME (Spain)</td> </tr> <tr> <td>• MFGI (Hungary)</td> <td>• SGU (Sweden)</td> </tr> <tr> <td>• GSI (Ireland)</td> <td>• METU-PAL (Turkey)</td> </tr> </table>	• GEUS (Denmark)	• IRIS (Norway)	• BRGM (France)	• NIVA (Norway)	• IFPEN (France)	• SPR Sintef (Norway)	• BGR (Germany)	• BGS (UK)	• OGS (Italy)	• HWU (UK)	• URS (Italy)	• IMPERIAL (UK)	• TNO (Netherlands)		• RBINS-GSB (Belgium)	• GEO-INZ (Slovenia)	• UNIZG-RGNF (Croatia)	• S-IGME (Spain)	• GFZ (Germany)	• METU-PAL (Turkey)	• CO ₂ GeoNet	• LEGMC (Latvia)	• GBA (Austria)	• GTC (Lithuania)	• RBINS-GSB (Belgium)	• PGI-NRI (Poland)	• SU (Bulgaria)	• LNEG (Portugal)	• UNIZG-RGNF (Croatia)	• GEOECOMAR (Romania)	• CzGS (Czech Republic)	• AGES (Serbia)	• TTUGI (Estonia)	• SGUDS (Slovakia)	• GTK (Finland)	• GEO-INZ (Slovenia)	• G-IGME (Greece)	• S-IGME (Spain)	• MFGI (Hungary)	• SGU (Sweden)	• GSI (Ireland)	• METU-PAL (Turkey)
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Press release announcing publication of the WP2 key report “State of play on geological storage of CO₂ in 28 European countries”

Transport and Storage

State of play of geological storage of CO₂ in 28 European countries

The report “State of play on CO₂ geological storage in 28 European countries”, published in the framework of the Pan-European Coordination Action on CO₂ Geological Storage (FP7 CGS Europe project), reflects the current situation and achievements regarding geological storage of CO₂ in the 28 European countries covered by CGS Europe.

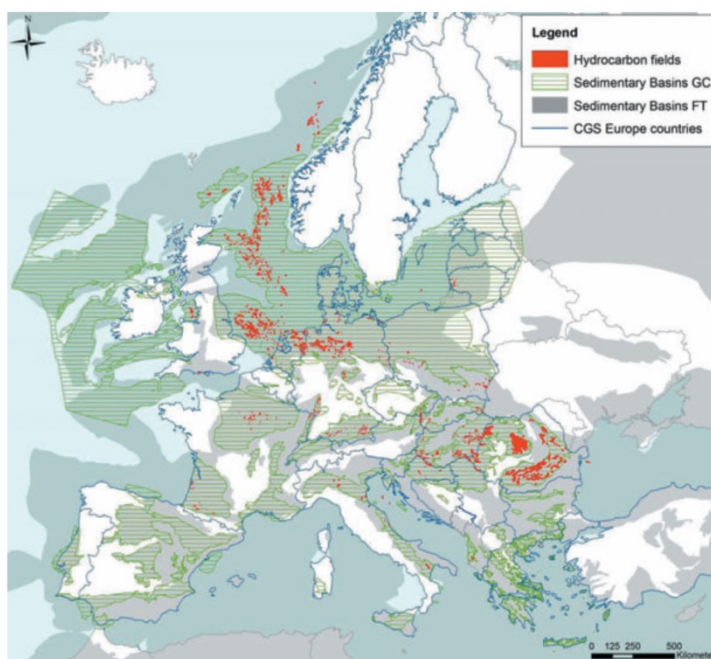
The European Commission recently took the first step towards developing a 2030 framework for EU climate change and energy policies. The Commission also published a Consultative Communication on the future of CO₂ capture and storage (CCS) in Europe, aimed at initiating a debate on the options available to ensure its timely development. In parallel, The European Parliament is preparing a report on developing and applying CCS Technology in Europe.

The report gives a brief overview of the CO₂ storage options, potentials and capacities in Europe. It summarizes information on research activities and organization of research funding related to CO₂ storage in each of the CGS Europe countries.

Information on a national level is complemented by an overview of activities on a regional and European level. Current pilot, demo and test sites in the CGS Europe countries are listed, followed by an overview of the state of transposition of the EU Directive on the geological storage of CO₂ and the level of public awareness in the individual countries.

For a Europe-wide comparison, a ranking is provided assessing the overall national achievements regarding CO₂ storage in the 28 European countries. The current level of CCS activities in European Countries varies widely between well advanced countries, such as Norway, and CCS-rejecting countries that have not even transposed the EU CCS Directive into national law. CGS Europe exchanges geo-technical knowledge between advanced and following countries in order to level the playing field and pave the way for the future deployment of CO₂ storage pilot and demonstration projects in Europe.

The report is a valuable information pool for the current debate on the future CO₂ Capture and Storage in Europe. The CO₂GeoNet Association, the European network of excellence on CO₂ geological storage, in close connection with the CGS Europe FP7 project, here expresses the views of a pan-European consortium involving 34 research institutes from 24 EU Member



Extent of sedimentary basins (in grey: Fugro Tellus (FT), 2008; in shaded green: GeoCapacity (GC), 2009) and potential hydrocarbon fields for CO₂ storage in Europe (GeoCapacity, 2009). CGS Europe countries are marked by blue borderlines. Note that countries that are completely surrounded by CGS Europe countries, but are not member of CGS Europe, also appear with blue borderlines as is the case for Switzerland, Luxembourg, San Marino, The Vatican State, Lichtenstein, Monaco and Andorra

States and 4 Associated Countries. As such representing the European scientific community on CO₂ Geological Storage (CGS),

CO₂GeoNet and CGS Europe wish to share their expert input for the debate on taking CCS forward in Europe.





About CO₂GeoNet

CO₂GeoNet is the European scientific body on CO₂ geological storage. Founded by 13 public research institutes from 7 European countries, it brings together over 300 researchers with the multidisciplinary expertise needed to address all aspects of CO₂ storage. With activities encompassing joint research, training, sci-

entific advice, information and communication, CO₂GeoNet has a valuable and independent role to play in enabling the efficient and safe geological storage of CO₂. As of 2013, the membership of CO₂GeoNet is expanding thanks to the support of the FP7 CGS Europe project. More about CO₂GeoNet at : www.co2geonet.eu

On 25 November 2013, two press releases titled “State of the Art of Monitoring Methods to evaluate Storage Site Performance” and “State of the art review of CO₂ Storage Site Selection and Characterisation Methods” were produced, announcing the online publication of two CGS Europe key reports produced in WP3 “Knowledge repository”. These reports are a valuable source of information for the current debate on the future of CO₂ Capture and Storage in Europe. The first report discusses state-of-the-art monitoring techniques, introduces general concepts and gives recommendations for procedures to set up site-specific monitoring plans. This is complemented by an overview of monitoring applications employed at demo or pilot CO₂ storage sites or in field tests. The second report presents and discusses all the steps required to assess the capacity, performance and integrity of a site. Both reports are available on the CGS Europe website www.cgseurope.net, in both an interactive online version and a pdf version for download.

All press releases and the related deliverables have been sent to all journalists with whom we are in contact. Moreover, project partners used their media distribution channels and websites to disseminate the information.

<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Press Release 25th November 2013</p> <p style="text-align: center;">Report “State of the Art of Monitoring Methods to evaluate Storage Site”</p> <p>The report is the result of a joint study carried out by various members of the CGS Europe project (www.cgseurope.net) – the ‘Pan European Coordination Action on CO₂ Geological Storage’, funded within the 7th framework programme of the EU. The report is based on current literature on monitoring of CO₂ geological storage sites and illustrated with exemplary monitoring plans proposed for two potential future CO₂ storage projects. It focuses on Europe and the EU CCS and Emissions Trading Directives and closely follows their definitions and terminology.</p> <p>The main objective of this report is to identify and review monitoring methods for a performance assessment of geological CO₂ storage sites. This report discusses state-of-the-art monitoring techniques, introduces general concepts and gives recommendations for procedures to set up site-specific monitoring plans. This is complemented by an overview of monitoring applications employed at demo or pilot CO₂ storage sites or in field tests. There is a special focus on establishing site-specific monitoring plans, with two examples selected to represent the two major storage options in Europe and worldwide, namely saline aquifers (Romanian example) and depleted gas fields (Slovakian example). Finally, recommendations for future research and development activities are discussed.</p> <p>This report is a valuable source of information for the current debate on the future of CO₂ Capture and Storage in Europe. The CO₂GeoNet Association, the European network of excellence on CO₂ geological storage, in close connection with the CGS Europe FP7 project, here expresses the views of a pan-European consortium involving 34 research institutes from 24 EU Member States and 4 Associated Countries. As they represent the European scientific community on CO₂ Geological Storage (CGS), CO₂GeoNet and CGS Europe wish to share their expert input for the debate on taking CCS forward in Europe.</p> <p>Full deliverable for download at: http://repository.cgseurope.net/eng/cgseurope/knowledge-repository/key-reports/evaluation.aspx</p> <p><small>Press Contacts: CO₂GeoNet Secretariat – Sergio Persoglia: +39 329 26 07 303 email:info@co2geonet.com CO₂GeoNet - CERI - University of Rome “La Sapienza” – Samuela Vercelli +39 347 26 29 398 e-mail samuela.vercelli@uniroma1.it</small></p>	<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Press Release 25th November 2013</p> <p style="text-align: center;">Report “State of the art review of CO₂ Storage Site Selection and Characterisation Methods”</p> <p>The report is the result of a joint study carried out by various members of the CGS Europe project (www.cgseurope.net) – the ‘Pan European Coordination Action on CO₂ Geological Storage’, funded within the 7th framework programme of the EU. The report is based on current literature on monitoring of CO₂ geological storage sites.</p> <p>The main objective of this report is to identify and review site selection and characterisation methods. This report presents and discusses all the steps required to assess the capacity, performance and integrity of a site. Simulation of CO₂ storage in an underground formation requires a complex multi-disciplinary effort, with the analysis of a number of interacting processes, including geology, multi-phase flow and transport, geochemistry and geomechanics. A site characterisation first calls for the geological characterisation and modelling of the site at basin and reservoir scales and the modelling of flow and transport mechanisms so as to simulate the short-term to mid-term behaviour of the storage. As well as hydrodynamic effects, geomechanical effects generated by the injection of a large volume of fluid in the subsurface have to be modelled over a long period. Modelling geochemical and biological processes is essential to understand the geochemical feedback on the reservoir properties and the trapping mechanisms that will occur. All these skills and knowledge are required to assess potential environmental impacts and risks. The estimation of the economical viability of the project is also essential to decide whether a geologically suitable storage site can actually be developed for CCS. In parallel with the technical aspect of characterising the site, public perception and acceptance appears to be a potential major impediment to deployment of CCS and so social activities towards local communities have to be performed at a very early stage.</p> <p>This report is a valuable source of information for the current debate on the future of CO₂ Capture and Storage in Europe. The CO₂GeoNet Association, the European network of excellence on CO₂ geological storage, in close connection with the CGS Europe FP7 project, here expresses the views of a pan-European consortium involving 34 research institutes from 24 EU Member States and 4 Associated Countries. As they represent the European scientific community on CO₂ Geological Storage (CGS), CO₂GeoNet and CGS Europe wish to share their expert input for the debate on taking CCS forward in Europe.</p> <p>Full deliverable for download at: http://repository.cgseurope.net/eng/cgseurope/knowledge-repository/key-reports/evaluation.aspx</p> <p><small>Press Contacts: CO₂GeoNet Secretariat – Sergio Persoglia: +39 329 26 07 303 email:info@co2geonet.com CO₂GeoNet - CERI - University of Rome “La Sapienza” – Samuela Vercelli +39 347 26 29 398 e-mail samuela.vercelli@uniroma1.it</small></p>
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Press releases announcing publication of key reports on state of the art of ‘storage site monitoring’ and ‘storage site selection and characterisation’

5. Planning beyond the end of the project

The considerable investment that the CGS Europe partners made during the 3 years of the project to set the foundations of a stable relationship between the scientific community working in the CO₂ storage field and scientific journalists is nothing but a starting point on which CO₂GeoNet, with its now expanded partnership, will continue to build upon.

Supporting quality standards for media information on such a complex and multidisciplinary technology as CGS is a long term task and a constant challenge. The experience gained during the CGS Europe project is not going to be lost.

While in the ending phase of the project we are keeping the lights on the final deliverables of the CGS Europe project, we will also seek further opportunities for giving visibility to the continuing work of researchers.

One of the difficult aspects of journalists' involvement is the need for the funding of their traveling expenses. These expenses might be in the future supported by the single institutes or by the Network depending on availabilities. Nevertheless, there is now a certain number of journalists who could participate to our events and get a top level introduction to the topic, we plan to follow up with them also in the future as we have been doing during the last few months, sending them updates and announcements about new research results and inviting them to participate to events like the Venice Open Forum.

These activities will now be part of CO₂GeoNet Programme of Activities and, in particular, of the Information and Communication Task Force.



CO2 kan gemmes i undergrunden / CO2 can be stored underground

(English translation by Niels Poulsen – CO2GeoNet-GEUS)

<http://videnskab.dk/miljo-naturvidenskab/co2-kan-gemmes-i-undergrunden>

You can get rid of the greenhouse gas CO2 by sending it into the ground and by this way limit global warming. In Denmark, however, the government would rather stand on the side line. The climate Minister is calling the technology immature.

Topics: Sustainability, Energy, Pollution, Energy for the Future, Innovation, Climate, Environment, Politics

By: Henrik Bendix, journalist

The man-made global warming caused by CO2 from burning coal, gas and oil that we are extracting from underground. The source of the problem thus lies under our feet, but perhaps part of the solution also lies there.

It is possible to capture CO2 and send it into the ground where it can be stowed safely for thousands or millions of years.

The pollutant gas can be pumped into depleted oil and gas fields or reservoirs of salt water deep in the underground. Geologists have located lots of places that are suitable for long-term CO2 storage - even in the Danish underground.

It is going too slow

Europe's leading researchers in the capture and storage of CO2, abbreviated as CCS - has just been gathered for the conference CO2GeoNet Open Forum in Venice, and Videnskab.dk was invited.

Among the scientists who made presentations to the colleagues, we find Niels Poulsen, senior researcher at GEUS - Geological Survey of Denmark and Greenland.

He says there is plenty of room for CO2 in the Danish underground, but the lack of political will.

"It is going too slow with CCS in Denmark. It has decided that we will not do anything the next many years. We should at least continue to do research," said Niels Poulsen.

Skin Holy Danes

Geology Professor Niels Peter Christensen is another great capacity in this area. He also believes that a lack of ambition in this area.

"Politically, we are hypocritical in Denmark," he said, referring to that we Danes are among the EU's largest emitters of CO2, while we contribute to the problem by pumping gas and oil out of the ground in the North Sea.

He is now employed by the Norwegian state company Gassnova, which will be responsible for CO2 management in Norway. Millions of tonnes of CO2 have already been sent down in the Norwegian underground, and Norway has big plans in this area.

Minister: CCS is an immature technology

But climate minister Martin Lidegaard does not regard geological CO2 storage as a weapon in the fight against global warming.

"I do not believe that CCS technology is mature enough to be included in the plans for a future energy or as a means to reduce greenhouse gas emissions in a cost effective and secure manner," he writes to Videnskab.dk

If the technology must be mature, it requires more research. However, in Denmark it is actually not even allowed to even small research pilot with injection of CO₂, and it annoys Niels Poulsen.

"I think politicians as soon as possible work on examining the storage options in Denmark - everything from capacity to security."

Waiting for other countries

Researchers can give up hope of CCS projects in Denmark; the Danish Parliament has decided that must not be done anything in this area before 2020. We will await the foreign experience.

The Parliament has implemented the EU directive which aims to promote CCS technology in an environmentally sound manner, and at the same time also shot technology for a corner.

"With the decision was taken in parliament after having passed the bill which implements the CCS Directive into Danish law, there will not even be any research licence for injection of CO₂ in the subsurface. Whether it will be allowed after 2020 depends on whether the subject is raised to a substantive discussion in parliament," says Martin Lifeguard.

Power plants can provide an environmental benefit

With the CCS technology you can prevent CO₂ pollution not only from coal- or gas-fired power plants but also from heavy industry such as steel mills and cement plants.

In fact, you can build power plants that actually are good for the environment, since CO₂ is pulled out of the atmosphere. It is certainly the case if the power plant is using biomass and the CO₂ from the power plant is collected and stored underground.

CO₂ is separated from the other gases in the smoke, and it is then compressed to be liquid and sent to the pumping station for the geological storage by pipeline or by ship.

The storage of CO₂ is a part of the solution

Geological storage of CO₂ cannot solve all the problem of global warming, but if you can save enough CO₂ out of the way, you can buy more time to develop new technologies and find energy sources that can replace fossil fuels.

Climate researchers emphasize the urgent need to reduce CO₂ emissions to the atmosphere if we are to limit global warming and make sure that the temperature does not rise more than two degrees.

There is a need for more renewable energy and we need to save energy and use it more efficiently. Some countries rely on nuclear power as part of the solution, but according to scientists, it will still not be enough.

Wind turbines do not solve the problem

All tools must be used, and capture and storage of CO₂ may be responsible for a fifth of the reduction of CO₂ emissions is needed by 2050. But not in Denmark.

"The Danish position is that you should just patch windmills up anywhere, this will solve everything. But then does not take care of the CO₂ pollution that comes from the steel industry, cement industry and so on," says Niels Poulsen.

"It should be done because CO₂ emissions from industry are almost as big as from power plants. Steel and cement industries require coal. And we cannot imagine a world without steel or cement."

Danish project was dropped

There have otherwise been planned for a CCS project on Danish soil, specifically in Northern Jutland, where the plan was to pump CO₂ from Nordjyllandsværket into the ground.

"Alone in Vedsted structure, which is a small geological structure in Northern Jutland, we could have saved one million tonnes of CO₂ per year," says Niels Poulsen.

The liquid CO₂ could be pumped into a saline reservoir in a sandstone formation more than a kilometre down into the ground.

From here it would not be able to get up again, above the sand stone formation; there are several layers of clay and chalk, which acts as an impermeable barrier for CO₂.

But the plans were cancelled. "In my opinion, Denmark has decided to stand on the side line because there was very strong opposition from a very small group of people up in northern Jutland."

CO₂ can provide more oil

Climate Minister has no comment on whether the local resistance in North Jutland played a role in Parliament's decision to prohibit the storage of CO₂ in the country indefinitely. He would rather speak more generally:

"There have been political concern about the storage of CO₂ on shore shall be permitted, and it is not decided whether CCS is a technology we will use in the future in Denmark. There cannot be issued licences for storage on shore, before there has been given a decision after a discussion in the Parliament."

The Danish politicians, however, will allow oil companies to pump CO₂ into oil fields in the North Sea, if the aim is increasing oil production.

When the CO₂ is mixed with oil, the oil becomes more thinly liquid and therefore easier to get up. So using CO₂ can then squish more oil out of the ground.

This form of geological storage of CO₂ can hardly be called a helping hand to the environment.

Opponents fear spills

In other countries, politicians are not the same reservations about CCS, but some of the projects have met local opposition.

Opponents of geological CO₂ storage are not convinced that CO₂ remains in the ground. They are, for example, worried that it can penetrate through cracks and crevices, so it can pollute groundwater or even suffocate man and beast.

Answering to this, the researchers say that one does not have to be afraid of release. There are natural reservoirs that have stored on CO₂ for millions of years, and further are the oil and gas fields proving that the ground can hold liquids and gases in a very long time. Various existing projects around the world have neither given any problems.

The message from the European researchers is that it is urgent to get several scientific pilot projects established - and also large demonstration projects if possible. So, CCS can indeed be part of the defence against global warming.

Picture captions:

Since 1996, 13 million tons of CO₂ sent back to the ground by the Norwegian gas field Sleipner. Was it not happened, had the greenhouse gas polluted atmosphere of the place. (Illustration: Statoil)

Burning coal, gas and oil creates the CO₂ causing the man-made global warming. (Photo: Colour box)

ORIGO

Alig működik a szén-dioxid-varázslat / Hitch in carbon dioxide magic

(English translation by György Falus – MFGI)

<http://www.origo.hu/idojaras/20130508-hol-tart-a-szendioxidlevalasztas-tarolas-technologia-uveghazhaz-klimavaltozas-globalis-felmelegedes.html>

András Ferenczi, ORIGO.hu, 9 May 2013

The European Conference on geological storage of carbon dioxide was held in a former lunatic asylum in Venice. According to the participants the idea is not lunatic at all, it just costs a lot. Financing is potentially available, from oil companies, for instance.

Despite the increased involvement of renewable energy technologies most of the world's energy demand is still covered by burning coal, oil and gas. These conditions are to stay for long, carbon dioxide capture and storage (CCS) experts say.

Despite the fact that nuclear and renewable energies are also on the market, almost 87 percent of the world's energy consumption is covered from fossil fuels. Moreover, the increasing demand for energy in China and other developing countries is mostly covered by coal (even if China attempts to change this).

Over 34 billion tons of CO₂ is emitted to the atmosphere worldwide from burning fossil fuels. This gas contributes to increasing surface temperatures and ocean acidification. The effect of climate change is clearly experienced also in Hungary, with winter conditions in March and tropical heat in summer.

Nick Riley, the expert of the British Geological Survey (BGS) has alarmed journalists, invited to the Venice meeting in San Servolo, with new temperature and geological information concerning the ice sheet thickness of the Arctic. According to the new measurements, the thickness of the polar ice sheet last year was half of the 1979-2000 average, he said. The continuously increasing CO₂ emissions pair up with increasing global temperatures.

Extreme weather conditions are in relation with global warming, and CCS could be one of the technologies to mitigate these processes, many of the authentic research groups state. Nevertheless, the supporters of these ideas are generally coming from fossil fuel producers and users. Most of the CCS-related research is financed by large oil companies and power companies.

The known method

How could the greenhouse gas from the power plants be captured? The main idea behind CCS-technology is to equip gas, oil or coal fired power plants with apparatus that can separate carbon dioxide from the process before or after the combustion. Similar equipment would be used for large industrial emitters, i.e. cement plants. The separated CO₂ is then transported via pipe lines or tankers and is finally injected into geological formations that can sequester greenhouse gas. Such formations could be depleted oil and gas reservoirs, coal seams or saline formations.

The technology is relatively well known by scientists and has been used for decades in the oil industry and mining. The method is mostly used in the United States for enhanced oil recovery (EOR).

Based on the calculations of the International Energy Agency CCS technology could contribute about 20% to the global carbon emission reductions by 2050, thereby slowing down global warming processes. In order to achieve this ambitious goal, somewhat more than 100 power plants should be equipped with CCS technology already by 2020.

Intake, compression, power, exhaust?

The compression process seems to be the least problematic in the CCS-technology chain. The captured CO₂ is compressed, liquefied and therefore its volume dramatically decreases.

Transport is a more complex process, as capture of carbon dioxide does not necessarily take place where storage is available. The compressed liquid can either be transported via large tankers or pipe lines. Ship transport is rather expensive due to limited capacities. Nevertheless, the most recent tankers are capable of transporting over 230.000 cubic meters of liquid gas.

The ship transport method could be used for off-shore storage sites, however pipeline transport seems more plausible for CCS technology. Pipelines already exist around oil and gas fields, furthermore they provide cheaper and safer transport opportunity for carbon dioxide.

The risk of injected carbon dioxide leaking to the surface requires the highest level of caution when selecting the site for storage. Three main options exist. One of these is storing the CO₂ in depleted oil and gas reservoirs. These objects are well known by the petroleum industry and most of them are believed to provide safe storage opportunity. However, wells earlier used for production must be carefully observed to avoid surface leakage through some of the damaged or insufficient objects.

Methane recovery

Unmineable coal seams ensheal another option for storage. The specific surface of coal is large and is able to adsorb carbon dioxide. These coal layers frequently contain methane, an important component of natural gas. The methane can be exchanged with the CO₂, resulting in financial benefit through the injection. This technology has been used for over 2 decades in the United States producing millions of cubic meters of gas annually from some 6000 wells.

The highest storage capacity, however is available in saline reservoirs. These volumes are present within the 700-3000 m depth range, and are to be found in most areas in the world. Nevertheless, these areas are generally unknown. Basin systems in Europe, i.e., the North Sea Basin, the Pannonian Basin or the South Permian Basin represent such potentials for storage.

In all three storage cases the most important requirement is to have a cap rock that is able to hold carbon dioxide back and hinder its leakage to the surface. The adequate, dome-shaped cover rock that keeps carbon dioxide in the storage formation is also necessary. A minimum depth of 800 m is important to have high-enough temperature and pressure conditions to keep the injected CO₂ in dense phase. Finally, carbon dioxide storage must not compromise the quality of potable water.

Owain Tucker, from Shell has presented the Quest project in Alberta. The project costs are around 1.4 billion CAD, with over 80 percent of the costs for capture and compression and approximately 10-10 percent for transport and storage.

Colourless, odourless asphyxia

“100 percent of the carbon dioxide is leaking to the atmosphere now. Are you OK with that?” – reacted Nick Riley on the question of a German journalist, who questioned the safety level of CCS-technology. The concern is not unfounded. Carbon dioxide is colourless and odourless. It is neither explosive, nor flammable, however it is heavier than air. When leaked to the surface, CO₂ can gather in topographic lows, valleys and could lead to asphyxiation of living creatures.

An unexpected event of some 300 thousand tons of CO₂ outburst took place in Cameroon in 1986 from a natural reservoir. The colourless and odourless gas killed 37 people and hundreds of animals in 25 km radius. Over 1700 people have suffered serious, irreversible injuries. Even today the geologists are still puzzled by this event. It is believed to have been related either to an earthquake or a volcanic eruption. Nevertheless, the tragic event continuously reminds CCS experts that storage requires increased caution.

Ten years of experience

Theoretically, with a well selected storage site the risk of leakage is minimal. Nonetheless, the scientific community has developed a long list of safety protocols for continuous monitoring. Among others well integrity, the behaviour of the cap rock, surface leakage, atmospheric conditions as well as seismic motion are carefully monitored. In an optimal case, baseline monitoring should be started 10 years before the injection of carbon dioxide begins, said Sergio Persoglia in relation with a planned Italian project. He also stated that every single square centimetr of the ground must be well known, and all permissions need to be received.

Currently 8 full scale CCS projects are running worldwide. This number is well behind the planned several hundred. However, there are dozens of projects in advanced stage of planning, and have only been suspended, due to the economic crisis.

The main reasons for the slow deployment carbon geological storage are not related to safety issues but are to do with economic considerations. It is still much cheaper to emit the greenhouse gas into the atmosphere than to inject it in the subsurface, although the EU is ready to finance the projects with billions of euros. The solution could be price reduction in the technology, governmental intervention in the form of direct support and environmental taxes.

‘Seeing is believing?’ – article in Public Service Review - Europe, issue 25, March 2013
by Nick Riley (CO2GeoNet-BGS)

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ENVIRONMENT

Seeing is believing?

Dr Nick Riley, Chair of CGS Europe, provides a geoscientist's perspective on the potential of CCS, and why policymakers may have been slow to act on CO₂ emissions...

Born in the mid-1950s I was brought up in the Lancashire Coalfield of the North West of England, a region located in the Industrial Revolution's 'womb'. Its lifeblood was energy from coal. As a young boy, the landscape around me was a 'Lowry canvas' of power plants, gasifiers, coke works, cotton mills, brick works, metal foundries, coal mines, steam trains, canals, quarries and cement kilns. Trees around me were dying. Streams and rivers flowed bog-iron orange, tainted by acid mine water, or took on the colour of whatever dye was being used in the mills upstream. Winter brought choking, blinding, smogs (in which I became a casualty). War veterans, like my granddad and his pals, whose lungs had survived the phosgene of Europe's World War I battlefields, coughed and spat thick phlegm. Once-majestic Millstone Grit buildings were 'widow black', coated in grime. Snow turned speckled grey, dappled with soot. Birds died. You could taste and smell the sulphurous air.

My mum bought me my first book on geology, 'The World in the Past', with its prose and images of the 'Age of Sea Lilies', and 'Age of Ferns', evidence of which was strewn about the coal tips and quarries in which I played. She also bought me Rachel Carson's 'Silent Spring', which linked the insecticide DDT with thinning of bird eggshells and the resultant breeding failure, especially in birds of prey. One day I came home from school and told my dad he would die from lung cancer unless he stopped smoking. He was so shocked at his own child telling him this that he stopped immediately. Little did I know then of the extent to which vested interests in the tobacco industry tried to distort, confuse or deny the scientific evidence that smoking caused cancer and vascular disease.

It was easy to create political will, justify legislation and bear the cost of cleaning things up because people could see the air pollution and experience its immediate effects on their environment and health. The air in our cities had become intolerable. So, Britain began to modernise and start its post-industrial journey. The Clean Air Act was first introduced in 1956 and subsequent, ever tighter legislation ensued. Our manufacturing and raw materials industry started its decline, as countries that once exported their raw materials to the UK for manufacture into products, themselves industrialised. Britain began to import manufactured products from them.

Correspondingly, our emissions and pollution were 'exported' abroad as we became a consumer-led society. Imports exceeded exports and our economy got out of balance. The newly constructed National Grid, with its huge pylons and cables that linked electric power from new nuclear (with its promise of cheap, clean and limitless power) built on the coastlines, and new coal plants built on new coalfields, now came through our valley. The pound devalued. As the 70s arrived, John Lennon sang 'The Dream is Over' and Jimi Hendrix departed his and our 'Third Stone from The Sun'. The moon had been trodden on. We had seen our beautiful fragile Earth from space for the first time. Remarkably, some still believe to this day that the Earth is flat and the moon landing was a hoax.

Coal was still king and far from being a secure indigenous supply, overdependence on coal brought the UK to near economic and societal collapse as miners withdrew their labour, power supplies failed and the working week was reduced to three days. The government, which had recently joined Britain into the European Common Market that Sir Winston Churchill had inspired decades before, was brought down.

The Clean Air Act reduced the smoke from burning fossil fuels – the pollution that could be seen – but it did not deal with the unseen. Transparent gases such as sulphur dioxide belched increasingly into the sky, as our demand for electricity grew. The gas was blown across the North Sea, driven by our prevailing rain-laden south-westerly winds, combining with the cloud moisture to fall as 'acid rain'. Consequently, delicate and pristine Scandinavian lake ecosystems had their crystal clear waters acidified. Fish and the molluscs and insects on which they fed died. This same scenario was repeated with lakes in North America. Like the DDT issue, it was becoming ever clearer that pollution was a transboundary problem. We all share the same sky and ocean. Against protests that it would be too expensive and damage the economy, and that no commercially suitable technology existed to remove sulphur from power plant emissions, political will and diplomatic necessity ensured that regional and international standards on sulphur emissions were emplaced. Power plants were retrofitted with newly developing sulphur scrubbing technology and high sulphur coals were no longer fed into power plant boilers.

ENVIRONMENT



The source of the problem was solved, lakes began to recover, and building stones on our valuable historic monuments, which had survived the Great Fire of London and centuries of wars, floods and tempest, stopped dissolving away.

During the 1970s, it became clear that new 'inert' and mainly transparent, odourless, virtually indestructible gases, not found in nature, but created and synthesised by humans from halogens and hydrocarbons (chlorofluorocarbons or CFCs), were building up in the atmosphere in ever-increasing amounts. Used in many products and applications to propel aerosol cans, extinguish fires and enable air conditioning and refrigeration, CFCs were now very much part of modern life and its 'creature comforts' and 'ideal body image'.

Curiosity-driven science in the laboratory showed that far from being inert, these gases were extremely powerful in preventing heat escaping out into space from Earth – indeed, many thousands of times more potent than naturally occurring greenhouse gases. There was also strong evidence that CFCs could damage the ozone layer, high up in the stratosphere, which shields us from the dangerous ultraviolet (UV) radiation embedded in sunshine – too much exposure to which can cause skin cancer, cataracts, and degradation of the retina. UV can also damage the ability for plants to photosynthesise, thus threatening the base of the food chain. Scientists developed atmospheric models that predicted how much

ozone would be depleted. International negotiations began, aimed at limiting and phasing out the use of CFCs, except for specialised applications where no substitute propellant gas could be found. Some countries and vested interests took the position that the science was unproven, others claimed that no economic substitutes for CFCs were available, and that it would damage global economic growth to limit CFC use. Negotiations stalled, with resistant nations dragging their feet.

Meanwhile, at the southernmost tip of the planet, polar scientists of the British Antarctic Survey (BAS) had been taking daily measurements of UV radiation reaching the surface of Antarctica since the 1950s. By measuring the ratio between the two types of UV radiation reaching the ground – UVA and UVB – they could very accurately calculate the amount of ozone in the atmosphere directly above their 'simple' instrument, as ozone selectively absorbs UVB. Then, one Antarctic spring day, the instrument showed that ozone levels had decayed rapidly to such an extent that there was an ozone hole over the Antarctic. Nothing like this had been observed before. By this time satellite measurements were being taken. These aimed to phase out the primitive land-based BAS instruments in favour of much more sophisticated satellite-borne technology. News of the ozone hole from BAS was rejected, since the new satellites could not detect it. However, the ground-based instruments used basic physics to measure the ozone, and had a long and reliable track record. Satellites used newly programmed computer

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The ongoing burning of fossil fuels risks major changes in terms of global climate, sea level rise and ocean acidity

software, based on informed assumptions about the atmosphere, to filter and distil the ozone-relevant data from billions of other data points.

Months passed, and the scientists at the BAS stood firm. Eventually, the space scientists discovered that the computer software used by the satellites was at fault – it was not sensitive enough. Updated software revealed the extent of the ozone hole, the BAS was vindicated, and the world was shocked. Scientists realised they had oversimplified their atmospheric models. Some atmospheric scientists had learned the hard way that the models used to screen satellite-based data had to be ground truthed by accurate and reliable measurements from sources where it is clear what is being measured, such as the UVA/UVB ratio. The models had predicted an average rate of ozone destruction at all latitudes; but the predictions were wrong, reality was much worse, and the hole came as a complete surprise. The role of noctilucent clouds in the upper atmosphere had been omitted from the ozone depletion atmospheric models, despite such clouds having been observed since Victorian times.

The Montreal Protocol restricting and phasing out CFCs globally was quickly put in place. Regarded by former UN Secretary General Kofi Anan as the most successful UN agreement ever, it was supported by the majority of the member states. Although it will take until almost the end of this century before we know if the world acted fast

enough, CFC concentrations are gradually falling, and except for a few very specialised applications (e.g. medical), substitute gases have been found, without detrimental effects to the economy. Perhaps we acted just in time?

Today another colourless, odourless gas, carbon dioxide (CO₂) is entering the atmosphere at ever-increasing rates and building up in concentration, despite dissolving in the ocean. The world finds and burns more and more fossil fuel. This is risking, in human terms, a permanent and major change to global climate, sea level rise and ocean acidity. There seems to be little effective political will around the globe to take action with the urgency that the scientific evidence suggests is needed. If only CO₂ was as visible as the smoke that caused the smogs that I experienced as a child?

The properties of CO₂ as a greenhouse and ocean acidifying gas have been known for over a century, and proven many times over, both in the lab and in nature (even in military applications and research during World War II). Despite the overwhelming evidence, there are very effective and powerful lobby groups with short-term vested interests who deliberately distort and confuse the science, in the vain hope that their climate change denial will win the day and delay action. Then there are those who accept the science, but consider it uneconomic to deal with emissions now, or favour renewable and/or nuclear energy, thinking that we can phase out fossil fuels quickly enough. This latter thinking is clearly failing, and the former view is taking massive risks with our future, relying on a blind faith that we can all adapt to any consequences.

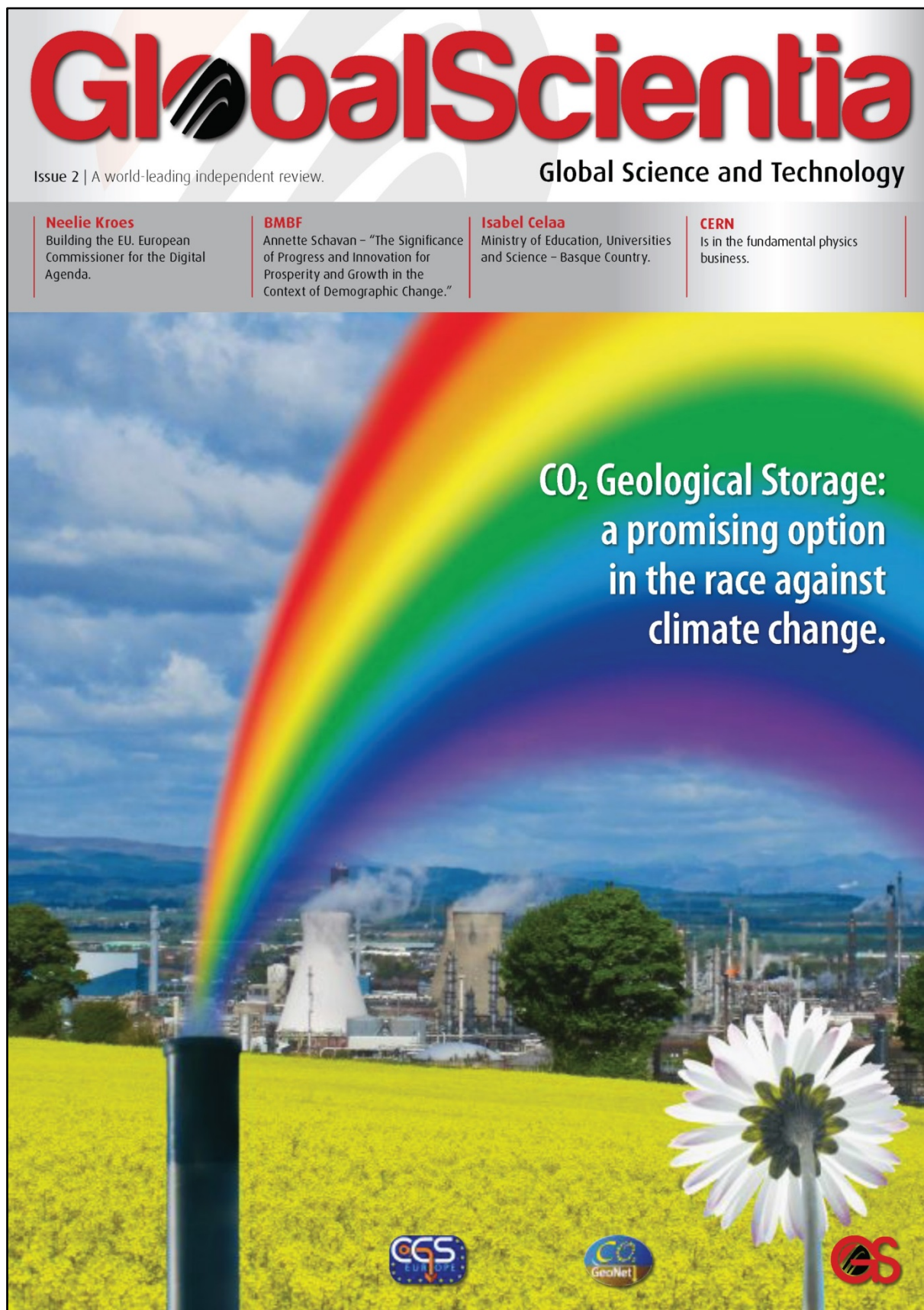
In my view, we either get rid of fossil fuels – and there is no sign of that happening any time soon – or we deal with them directly. So if you, or I, still want to burn fossil fuels we have to face up to applying the only technology that can deal with them directly: carbon capture and storage (CCS). This technology captures the CO₂ at the source where the fossil fuel is burnt, compresses it and then injects the gas deep underground in the same way natural gas is stored in many parts of Europe. CCS needs to be demonstrated at large scale in the context of power generation. Each part of the CCS chain has already been separately done, but it needs political will, an informed public and effective policies to ensure it happens at scale as an essential component of an integrated and diverse low-carbon emitting energy system. So far this has not happened, and it may be our last chance to act. To fail to act is a gamble with very high stakes, and the cards are definitely stacked against us.



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‘CO₂GeoNet and CGS Europe: A European response to global climate change through CO₂ geological storage’ – article in Global Scientia, issue 2, September 2012

by Isabelle Czernichowski-Lauriol (BRGM)



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CO₂GeoNet and CGS Europe: A European response to global climate change through CO₂ geological storage.



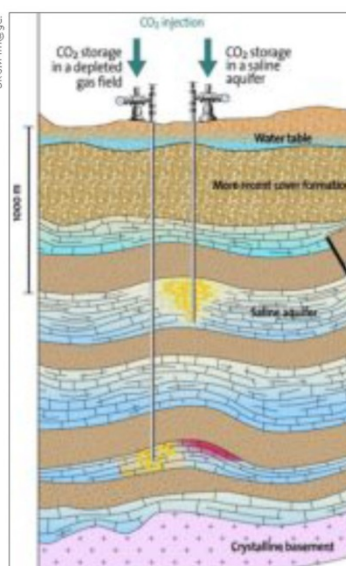
The European Union has already made significant progress in advancing CO₂ Capture and Storage (CCS) as a bridging technology for combating climate change. The situation now calls for acceleration, particularly in terms of getting CO₂ geological storage pilots and demonstration projects off the ground. CO₂GeoNet and CGS Europe are the result of a European joining of forces and expertise on all aspects of CO₂ geological storage, in the aim of supporting CCS demonstration and deployment and promoting trans-national cooperation and networking throughout the EU Member States and Associated Countries.

Returning the carbon back to the ground

Our prolific burning of fossil fuels for power production, heating, industry and transportation is responsible for 80% of anthropogenic CO₂ emissions into the atmosphere, of which 60% comes from large fixed emitters where CCS can be applied. CCS is a promising mitigation pathway that, according to the International Energy Agency, should contribute 20% of the CO₂ reduction needed by 2050 in order to achieve

stabilisation of greenhouse gas concentrations in the atmosphere in the most cost-effective manner. CCS involves capturing CO₂ at coal- or gas-fired power stations and industrial plants, transporting it by pipeline or ship to a storage location, and injecting

BRGM image.



it via a well into a suitable deep geological formation for long-term storage. In doing so, the carbon extracted from the ground in the form of coal, oil or gas is returned back again in the form of CO₂, making CCS a smart solution that can help avoid the current situation of large CO₂ emissions disturbing the atmosphere and provoking climate change, sea level rise and ocean acidification.

Time is pressing for storage pilots and demonstration projects

According to the EU Energy Roadmap 2050, CCS needs to be applied from around 2030 in the power sector in order to reach emission-reduction targets. Following 20 years of research and a number of pioneering CCS pilots and industrial operations, the world must now move into a large-scale demonstration phase, vital for enabling progressive commercial deployment within the right timeframe. In Europe, the first CCS demonstration projects are emerging under the leadership of major power and industrial companies and with financial support from the European Economic Plan for Recovery (EEPR), the NER300 mechanism for the

CO₂GeoNet

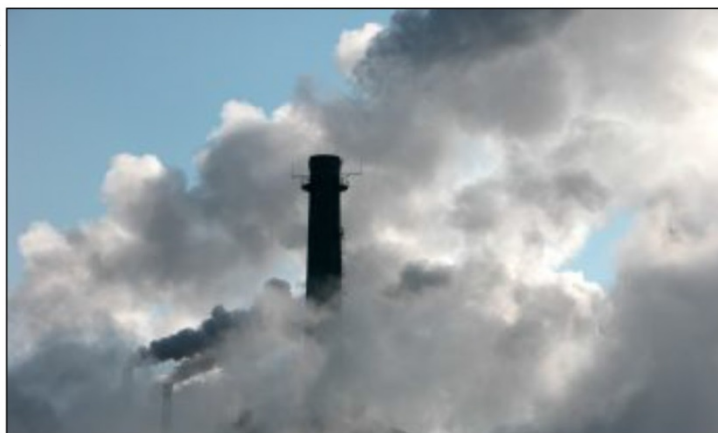
co-financing of CCS and innovative renewables in the framework of the European Union Emissions Trading System (EU-ETS), and Member States. The goal is to have 12 large-scale demonstration projects up-and-running by 2015 to harness knowledge and experience from a number of different geological, geographical and industrial contexts, both onshore and offshore. However, the very low price of CO₂ in the EU-ETS (<10€/ton) will not fund as many NER300 demos as anticipated and does not provide a secure environment for long-term investment. Other incentives are necessary.

Furthermore, the procedure for selecting, characterising and obtaining a permit for a storage site takes several years, and time is also needed for its connection to a CO₂-emitting plant by an appropriate transport infrastructure. No investment decisions can be taken for CCS projects without confidence early on regarding the storage site.

The scientific challenges and the expertise within CO₂GeoNet and CGS Europe

More research effort must now be placed on storage compared to capture, which has been attracting much attention to date. This is because each storage site i) is unique due to its specific geology - often complex and unexplored, and ii) must be capable of trapping CO₂ over periods of at least 1000 years. The scientific challenges of CO₂ storage are numerous: site selection and characterisation, modelling and monitoring of CO₂ fate and site behaviour, risk assessment - including possible local impacts on humans and ecosystems - and safety protocols. CO₂ storage is a complex field of research in which many different disciplines interact: geology, geophysics, geochemistry, geomechanics, hydrogeology, microbiology, ecology, reservoir engineering, oceanography, etc. Furthermore, various components of a storage site have to be considered: reservoir, cap rock, overburden, groundwater, soils, surface, vegetation, wells. Similarly with the different phases: planning period (~5 years), injection period (~40 years), closure period (~5 years) and post-closure period (~1000 years). The existence and study of many natural CO₂ fields in the

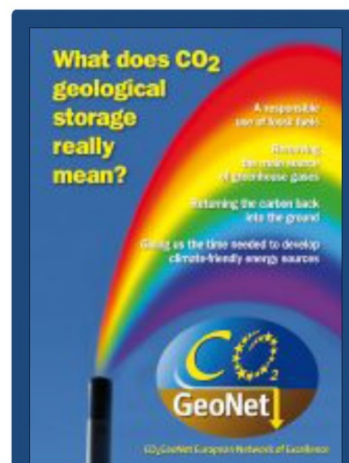
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subsurface proves that geological formations are able to store CO₂ efficiently and safely for extremely long periods of time.

In terms of storage, the abovementioned pilots and demonstration projects are vital for advancing knowledge concerning the storage capacity of a given site, and for testing on-site, in various storage settings, the performance of tools and methodologies developed for site characterisation, modelling, monitoring and risk management. The lessons learned from these field tests will be invaluable in improving the technological blocks so as to guarantee efficient and safe industrial-scale operations, as required by the European Directive on the geological storage of carbon dioxide adopted in 2009. The pool of expertise and research experience available within CO₂GeoNet* and CGS Europe* is a true resource for Europe, providing scientific support for the geological storage of CO₂ and facilitating the large-scale demonstration and deployment of CCS. Activities include research, scientific advice, training and information and communication on CO₂ storage matters. Durability will be ensured by expansion of CO₂GeoNet membership to include other CGS Europe partners, thus broadening the critical mass, extending geographical coverage to truly European, and offering privileged CO₂ geological storage contact points in the EU Member States and Associated Countries.

Article co-authors: Isabelle Czernichowski-Lauriol (i.czernichowski@brgm.fr) and Rowena Stead (r.stead@brgm.fr).



Find out more in 24 languages

The CO₂GeoNet brochure "What does CO₂ geological storage really mean?" tackles pertinent questions on this vitally important technology and explains the basics, such as how geological storage of CO₂ can be carried out, under what circumstances it is possible, and what criteria are needed for its safe and efficient deployment. You can learn more about site selection and characterisation and the monitoring techniques employed for CO₂ geological storage.

The brochure is the fruit of CO₂GeoNet's research activities and results, which were presented during CO₂GeoNet's Training and Dialogue Workshop on this same subject. It currently exists in 24 languages, thanks to the efforts initiated by CO₂GeoNet and that are now continuing under CGS Europe: www.co2geonet.com/brochure



CO₂GeoNet
The European Network of
Excellence on the Geological
Storage of CO₂

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‘CGS Europe and CO2GeoNet — taste of European research networking’ – article in Global Scientia, issue 3, April 2013

by Vit Hladik (Czech Geological Survey - CzGS)



CGS Europe and CO₂GeoNet – taste of European research networking

By **Vit Hladik**
Knowledge dissemination leader
of the CGS Europe project

CGS Europe, the Pan-European Coordination Action on CO₂ Geological Storage (CGS), and CO₂GeoNet, the European Network of Excellence on CGS, were introduced to Global Scientia readers last year (Issue 2, pages 75-77). Since that time, Europe has, unfortunately, recorded only little progress in development and implementation of the CO₂ Capture and Storage technology (CCS), rather the opposite. The start of the long prepared European Demonstration Programme had to be postponed, mostly due to lacking commitment of national governments and funding gaps. This must not, however, make the impression that CCS, a key bridging technology for combating climate change, is not needed any more. The reverse is true. If we really want to decarbonise the power sector and heavy industry, as proposed by the EU Roadmap for moving to a competitive low carbon economy in 2050 and the EU Energy roadmap 2050, the share of the CCS technology on the decarbonisation efforts will be vital.

The role of science, research and development remains highly important in this area, not only with respect to the necessary cost reduction of the technology itself but also (and maybe primarily) in relation to the security of geological storage of the captured CO₂. The knowledge connected with safe CO₂ storage sites needs to be spread out across the whole Europe, since also the CCS technology is expected to be widely applied throughout the continent. In this respect, pan-European networking is inevitable, and the CGS Europe project (www.cgseurope.net) is playing its unsubstitutable role.

Pan-European networking and knowledge-sharing

The importance of international networking in research & development is often underestimated, and such activities and projects are sometimes regarded as second-class or unimportant in comparison with “real research” projects. Such opinions are, however, truly incorrect, and CGS Europe, in combination with all the



Fig. 1 “Our first research project on CO₂ storage in 2004 was worth 1,500 euros and aimed at a rough assessment of CO₂ storage possibilities in Romania. Now we are involved in the Romanian CCS demonstration project proposal worth 1.5 billion euros.” - Dr Constantin Stefan Sava, National Institute for Research and Development of Marine Geology and Geoecology – GeoEcoMar, Romania.

preceding networking activities in the field of CCS and CO₂ storage, is a clear evidence of how useful such networks can be.

It was back in autumn 2001, when ENeRG – the European Network for Research in Geo-Energy (www.energnet.eu) – for the first time invited researchers from the – at that time – EU Candidate Countries from Central and Eastern Europe to participate in the network’s activities. It was also for the first time when most of the researchers from “the East” heard about geological storage of carbon dioxide.

Since then, a lot has changed. The “new” network members of 2001 (and a few following years) have become research pioneers in the field of CO₂ storage and CCS in their countries and have also been active on the European research scene, including prestigious Framework Programme projects like EU GeoCapacity, CO₂NET EAST, ECCO and, most recently, CGS Europe.

It was impressive to follow the research careers of some colleagues based on their growing knowledge and international overview. The pioneering role of the institutions brought their CCS research leaders not only in positions of project coordinators, evaluators and scientific reviewers but also in roles of government and ministry advisors and industry consultants or first-ever university teachers of subjects like CO₂ storage or CCS technology. An impressive story titled “From € 1,500 to € 1.5 billion”, describing the development of CCS in Romania from the first sub-contract in the FP6 CASTOR research project in 2004 to the GETICA CCS demonstration project proposal in 2011 and presented recently by GeoEcoMar, the Romanian partner in CGS Europe, is another tangible example of how national R&D activities can grow using international support.

All the achievements and progress described above would have not been possible without European and international networking. Of course, the networking and knowledge-sharing activities alone are unable to build excellent national research in a new area. There must be commitment, efforts and governmental or industrial support on the national level as well, but with help of networking, the capacity building is much quicker and much easier.

CGS Europe is an excellent example of such a networking action. Pooling together research institutions from “forerunner” countries, with significant track record in CO₂ storage research (especially current members of the CO₂GeoNet Association – www.co2geonet.eu) and those from “follower” countries, with less experience and knowledge, the project offers abundant opportunities for knowledge-sharing, education, capacity building and awareness raising.

Reducing the gap

To reduce the knowledge gap between the “forerunner” and “follower” countries is one of the main goals of the CGS Europe project. Several types of instruments are used to achieve this objective. Among them, knowledge-sharing workshops, awareness-raising workshops and staff exchange play the cardinal role. Thematic knowledge-sharing workshops are organized every six months, providing an opportunity for spreading and exchange of knowledge among consortium partners. Four workshops have been organized so far, focused on natural CO₂ field laboratories, lessons learned from pilot and demonstration projects, legal and regulatory issues of CO₂ storage and national research programmes. Some of them included field trips providing opportunities to visit sites of high interest for CGS researchers.

The workshop on natural CO₂ laboratories (sometimes also called “natural analogues”), organized by the German project partner BGR at Laacher See in the Eifel region in western Germany, was an excellent example of a knowledge-sharing activity. The area offers a unique setting of a natural laboratory where naturally originated carbon dioxide streams from deep underground to the surface. Why do we need to study such sites? In fact, they represent an opportunity to study an analogue of a “worst-case” scenario of a CO₂ storage site, i.e. the case when CO₂ is leaking from the storage reservoir. Such scenario is presumably highly undesirable for a real storage project, and, due to the complex and strict regulatory requirements that a storage site has to meet to get a storage permit, it is very unlikely to appear in practice. Nevertheless, studying of such “what-if” cases in the form of natural analogues is very valuable from several points of view. Firstly, the scientists can study the behaviour of “leaking” carbon dioxide in shallow subsurface and its reactions with rocks, soil and groundwater. Secondly, these sites provide a good opportunity to study the impact of the “leaking” carbon dioxide on the environment. It would be appropriate to mention here, that the impacts observed at natural analogue sites are mostly very limited in size, usually not exceeding a few meters around the CO₂ vent itself. And, last but not least, the natural analogues

provide an excellent opportunity to test various monitoring methods that have to be effective at different storage sites in future. All of these aspects related to the ongoing and planned research of natural CO₂ laboratories were discussed at the above-mentioned workshop, contributing to spreading of the relevant knowledge throughout Europe.



Fig. 2 Natural CO₂ seep near Laacher See, Germany.

CCS awareness-raising workshops represent a completely different kind of activity. They focus on all kind of CCS stakeholders in “follower” countries, i.e. countries with limited CCS activity so far. The tradition of these workshops dates back to 2007 when the first awareness-raising workshop was organized in Zagreb, Croatia. Since then, three more workshops took place in Slovakia, Lithuania and Turkey, each significantly increasing the level of general awareness of and knowledge about the CCS technology in a particular region of Europe. The workshops usually start with an explanation about the role of CCS in the decarbonisation portfolio and climate change mitigation, followed by presentation of the principles of CCS and description of the current status of the technology and its deployment in Europe and worldwide. Country/region specific topics are usually discussed after that, including the local potential of implementation of the technology, suitable examples from abroad and more technology-specific subjects. As a result, workshop participants (embracing usually a broad spectrum of stakeholders from policy makers and regulators, through industry representatives and consultants, up to researchers and students) are provided with a comprehensive overview of the CCS technology, its current status and future expectations.



Fig. 3 Culture and Convention Center of the Middle East Technical University in Ankara – venue of the 2nd CGS Europe CCS awareness-raising workshop.

CGS Europe and CO₂GeoNet

International staff exchange is another activity contributing to the pan-European character of the CGS Europe project. Study visits provide an excellent opportunity for knowledge transfer and knowledge sharing to both young and senior researchers. One of the typical cases is a study visit of a researcher from a “follower” country at one of the “forerunner” project partners, aimed at execution of advanced laboratory tests or advanced modeling techniques that are not available at the home institute. Such visits represent an invaluable input in research capacity building across Europe.

Mapping of European research

“Who is doing what?” is a frequent question at international research events or in discussions with “people from Brussels” – those who are acting on European level, no matter if they are representing a European institution, association or multinational company. It is a big advantage of active networks like CGS Europe that such overview information can be gathered relatively easily and quickly. The feedback from Member States to the centre is one of the important roles of European

networks, and CGS Europe is no departure from this rule. This networking capacity has already been used several times during the project, like, e.g. when mapping the national research programmes on CO₂ storage or following the progress of the transposition of the EU directive on the geological storage of carbon dioxide (well beyond the official statements that were available).

An interesting project outcome is scheduled for the first months of 2013 – an overview report entitled ‘State of play on CO₂ geological storage in 28 countries covered by CGS Europe’. It will provide a long desired overview of current status of CGS-related research in Europe, including national programmes and projects that are often not well-known on the European level. In addition, an overview of other CCS-related activities like pilot and demonstration projects or status of national legislation are handled as well. As a result a “CO₂ storage activity map of Europe” could be compiled, describing the level of activities and commitment of individual countries (see Fig. 5). The report will be public and will be available on the CGS Europe website at www.cgseurope.net

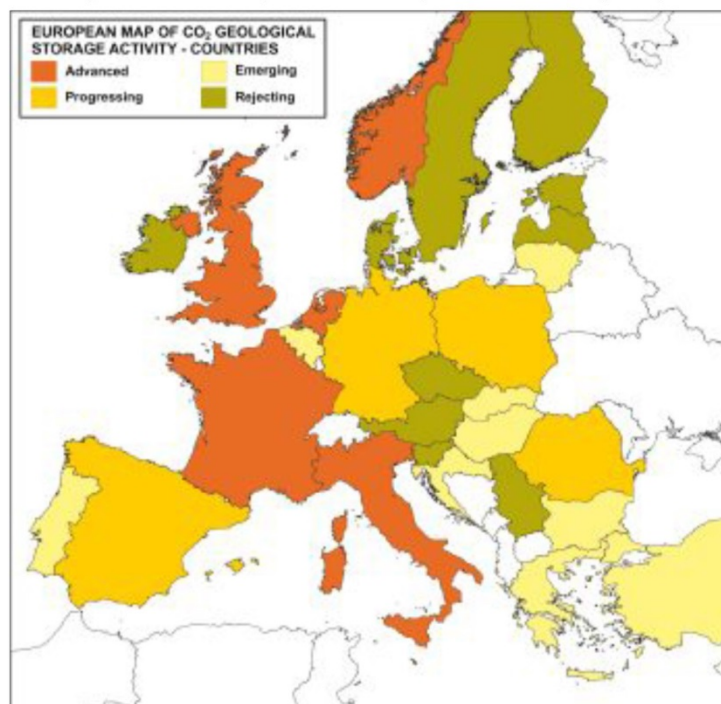


Fig. 5 Map of CO₂ geological storage activity in Europe. The countries are ranked according to the extent of relevant activities and commitment to CCS. Pilot and demonstration projects, status of national legislation, scope of national research and governmental support of research and development are taken into account.



Fig. 4 “Thanks to my CGS Europe study visit at IFPEN, I was able to perform first-class laboratory experiments on my rock samples that represent an important part of my PhD research.” - Kazbulat Shogenov, PhD student of Tallinn University of Technology, Estonia (pictured at IFPEN laboratory in Rueil-Malmaison, France).

CO₂GeoNet Open Forum – European top event on CO₂ storage research

The annual Open Forum held at the San Servolo island in Venice in the spring of each year is the knowledge-dissemination highlight of CGS Europe. The Forum represents a tradition founded by the CO₂GeoNet Network of Excellence (now CO₂GeoNet Association) in 2006. It is a European top conference bringing together CCS stakeholders from various target groups and providing them with the opportunity to keep up-to-date with and discuss the latest progress of CO₂ geological storage with researchers. In 2013, the 8th edition of the Open Forum is being prepared, with the main theme ‘Are pilot-scale CO₂ storage projects the way forward for CCS in Europe?’ The event dates are 9 – 10 April 2013. A CGS Europe knowledge-sharing workshop on ‘International cooperation and key results from European projects’ will be organized on 11 April as an affiliated action. More information about the event is available on the CO₂GeoNet website at www.co2geonet.com

Looking to the future

CGS Europe and CO₂GeoNet will continue working on durability of the pan-European CGS networking in future.



Fig. 6 San Servolo island in Venice – venue of the 8th CO₂GeoNet Open Forum held on 9-11 April 2013 (www.co2geonet.com).

This will be achieved by expanding the membership of the CO₂GeoNet Association to the interested research institutions who are active in CGS-related research. This process will start in 2013, changing CO₂GeoNet – currently comprising 13 members from 7 countries – into a really pan-European scientific body and strengthening its unique multidisciplinary expertise.

The enlarged Association will be ready to respond to the expected future research, training, scientific advice and information needs in the area of CO₂ geological storage. These needs will mostly be connected with the prepared pilot and demonstration projects that are likely to appear across Europe in near future, even if later than originally planned. The reason for

this expectation is obvious – it would be extremely difficult for Europe to achieve its long-term decarbonisation objectives and contribute to the worldwide climate change mitigation efforts without the CCS technology. Or shall we rather stop fighting climate change and release the CO₂ into the atmosphere without limitations?



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