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Awareness-raising workshop 1

"CO₂ Capture and Storage - Response to Climate Change"
Vilnius, Lithuania, 13-14 April 2011

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GTC (Gamtos tyrimų centras)

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1. Workshop report

The first awareness-raising workshop organised by the CGS Europe project was entitled “CO2 Capture and Storage – Response to Climate Change” and focused on the Baltic Sea Region and C&E European Countries. It took place in Vilnius, Lithuania, on 13 - 14 April 2011. It was organised in the premises of the Institute of Botany of Nature Research Centre (Zaliju Ezeru str. 49, Vilnius, Lithuania) that hosted the event by providing facilities and all the needed technical support. The workshop subject proved to be really topical in view of the current situation after adoption of the EU “climate-energy package”, including the EU Directive on the geological storage of carbon dioxide, and the ongoing transposition of the Directive to national laws of Member States.



Workshop venue - Institute of Botany of Nature Research Centre (Verkiai Palace), Vilnius

69 delegates took part in the workshop, coming from 16 countries (15 EU + Belarus); participants' list is provided below. Representative numbers by country: Belgium 1, Belarus 1, Croatia 1, Czech Republic 5, Denmark 3, Estonia 5, Finland 5, France 4, Italy 3, Latvia 6, Lithuania 19, Norway 2, Poland 11, Slovak Republic 2, Slovenia 1, Spain 2. A special invitation was accepted by the Vice-Minister of Environment of Lithuania Mr A.R. Zabulenas; the Nature Research Centre was represented by its director Dr. M. Zalakevicius. Both of them read opening addresses.

The structure of represented stakeholders was as follows: industry (19 participants), research institutions (43 participants), ministries (6 participants), international agencies (2 participants) and ZEP platform (1 participant).

Agenda of the workshop is attached bellow. The workshop programme was subdivided into 6 sessions covering the major aspects of CCS:

- Session 1: Climate change and CCS concept (4 oral presentations)
- Session 2: European policy, national regulations & international initiatives (6 oral presentations)
- Session 3: CO2 capture & CCS projects (4 oral presentations)

- Session 4: CO₂ geological storage – methodology, national programs, storage potential (7 oral presentations)
- Session 5: Alternative storage technologies (6 oral presentations)
- Session 6: Safety & public acceptance (4 oral presentations).

In addition to the oral presentation, a general poster session was organised as well. Altogether, 29 oral presentations and 16 posters were presented.



Mr A.R. Zabulenas, Lithuanian Vice-Minister of Environment, reading his opening address

The presentations were summarised in the round table discussions at the end of each day. Most of the discussions were focussed on the transposition of the CO₂ Directive, CO₂ storage potential of different countries and alternative CO₂ geological storage technologies. The latter is essentially important for countries that lack or have limited CO₂ storage potential in saline aquifers and hydrocarbon fields. The need for more extensive research of CO₂ transportation was stressed. New initiatives were discussed, such as establishment of co-ordinated research on alternative (carbonation) CO₂ storage technologies, establishment of a regional CO₂ network in the Baltic region, co-operation of CGS Europe project countries on CCS research with Belarus, etc.

The workshop was prepared by the Workshop Organising Committee; its members were S. Sliuopa (GTC), V. Hladik (CzGS) and A. Shogenova (TTUGI). On-site organisation was arranged by GTC.

Presentations (both oral and posters) were posted on the CGS Europe project website for public access - <http://www.cgseurope.net/NewsData.aspx?IdNews=57&ViewType=Actual&IdType=478>.



Participants of the Vilnius workshop

2. Involvement of CGS Europe project participants in workshop activities

- Organising Committee – GTC (Lithuania), CzGS (Czech Republic), TTUGI (Estonia);
- On-site organisation – GTC (Lithuania);
- Oral presentations – TTUGI (Estonia, 3 talks), BRGM (France), CzGS (Czech Republic), CO2GeoNet – GEUS (Denmark, 3 talks), PGI-NRI (Poland, 2 talks), GTC (Lithuania), GTK (Finland), SGUDS (Slovakia), UNIZG-RGNF (Croatia), CO2GeoNet – URS (Italy);
- Posters – LEGMC (Latvia), GTC (Lithuania), TTUGI (Estonia, 3 posters), CzGS (Czech Republic), GTK (Finland), SGU (Sweden) ;
- Sessions chairing – CzGS (Czech Republic, 2 sessions), GTC (Lithuania), CO2GeoNet – GEUS (Denmark), TTUGI (Estonia), GEO-INZ (Slovenia);
- Moderatorship of Round-table discussions – TTUGI (Estonia), CzGS (Czech Republic).



CO₂ Capture and Storage – Response to Climate Change
Regional workshop for the Baltic Sea Region and C&E European Countries
13-14 April 2011, Vilnius, Lithuania

AGENDA

Wednesday 13 April 2011

8:15-9:00	REGISTRATION
9:00-9:30	WELCOMING ADDRESSES Arūnas Remigijus Zabolėnas (Vice-Minister, Ministry of Environment of Lithuanian Republic) Mecislovas Zalakevicius , Director of Nature Research Centre
Session 1	CLIMATE CHANGE AND CCS CONCEPT Chair: Vít Hladík (Czech Geological Survey)
9:30 – 10:00	Climate change, CO ₂ emission trends and mitigation portfolio Jüri Ivask (Institute of Geology at Tallinn University of Technology, Estonia)
10:00 – 10:20	Why capture and store CO ₂ ? Tsukasa Yoshimura (Carbon Capture & Storage Unit, International Energy Agency)
Coffee break	
10:45 – 11:30	Principles of CO ₂ capture Stanley Santos (IEA Greenhouse Gas R&D Programme)
11:30 – 12:00	Principles of CO ₂ geological storage Marie Gastine (CO ₂ GeoNet / BRGM, France)

Refreshment & poster tour

Session 2	EUROPEAN POLICY, NATIONAL REGULATIONS & INTERNATIONAL INITIATIVES Chairs: Tore Torp (Statoil) & Saulius Sliampa (GTC)
13:00 – 13:30	Moving CCS forward in the EU Eric Drosin (ETP ZEP - European Technology Platform for Zero Emission Fossil Fuel Power Plants)
13:30 – 13:50	CCS legislation development in Europe and in the Baltic Sea region countries: progress and problems. Alla Shogenova (Institute of Geology at Tallinn University of Technology, Estonia)
13:50 – 14:10	CCS legislation framework in Lithuania Juozas Mockevicius (Geological Survey of Lithuania)
14:10 – 14:30	Carbon Capture and Storage – a Norwegian perspective Kristoffer Stabrun (Ministry of Petroleum and Energy, Norway)
14:30 – 14:50	Global progress towards CCS deployment – getting storage right is essential Angeline Kneppers (Global CCS Institute)
14:50 – 15:00	CGS Europe project Vít Hladík (Czech Geological Survey)

Coffee break

Session 3	CO₂ CAPTURE & CCS PROJECTS Chair: Vladimír Kolejka (Czech Geological Survey)
15:30 – 15:50	The Porto Tolle CCS demonstration project Pietro Barbucci (ENEL, Italy)
15:50 – 16:10	Spanish pilot CCS project Tomás Coca Stefaniak (CIUDEN, Spain)
16:10 - 16:30	Techno-Economic Evaluation of Biomass Fired / Co-Fired Power Plant with Post Combustion CO ₂ Capture Stanley Santos (IEA Greenhouse Gas R&D Programme)
16:30 – 17:00	Round Table discussion Implementation of CCS and regional cooperation Moderator: Alla Shogenova (IG TUT)

Workshop dinner	19:00 – 22:00
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Thursday 14 April 2011

Session 4	CO₂ GEOLOGICAL STORAGE – METHODOLOGY, NATIONAL PROGRAMS, STORAGE POTENTIAL Chairs: Niels Poulsen and Thomas Vangkilde-Pedersen (GEUS)
9:00 – 9:20	Methodology for selection and qualification of sites and project development for geological storage of CO ₂ Niels Poulsen (CO ₂ GeoNet / Geological Survey of Denmark and Greenland)
9:20 – 9:40	Industrial scale CO ₂ storage since 1996 – Experiences Tore A. Torp (Statoil, Norway)
10:00 – 10:20	Polish national programme on safe CO ₂ geological storage Adam Wojcicki (Polish Geological Institute)
Coffee break	
10:40 – 11:00	EU GeoCapacity - assessment of CO ₂ geological storage potential of Europe Thomas Vangkilde-Pedersen (Geological Survey of Denmark and Greenland)
11:00 – 11:20	CO ₂ storage potential of deep saline aquifers of Baltic Sea region – onshore Saulius Sliampa (GTC, Lithuania)
11:20 – 11:40	BASTOR - Baltic CO ₂ storage project Matti Nieminen (VTT Technical research centre of Finland)
11:40 – 12:00	Potential geological formations for CO ₂ storage in Belarus Andrei Kovkhuto (BelNIGRI, Belarus)

Refreshment & poster tour

Session 5	ALTERNATIVE STORAGE TECHNOLOGIES Chair: Alla Shogenova (IG TUT)
13:00 – 13:20	Preliminary characterization of perspective CO ₂ storage with enhanced coal bed methane recovery in the Upper Silesian Coal Basin (Poland) Włodzimirz Krieger , Janusz Jureczka (Polish Geological Institute), Jarosław Chećko (Central Mining Institute, Poland)
13:20 – 13:40	CO ₂ mineral carbonation by oil shale wastes from Estonian power production Mai Uibu (LIMTUT, Estonia), Rein Kuusik (LIMTUT, Estonia), Kazbulat Shogenov (IGTUT, Estonia)
13:40 – 13:55	Long-term storage of CO ₂ as magnesium carbonate in Finland Nicklas Nordbäck (GTK, Finland)

13:55 – 14:15	Experimental results of CO ₂ carbonation in Western Carpathians ultramafic rocks Martin Radvanec , Ľ. Tuček, K. Čechovská, J. Derco and Z. Németh (State Geological Institute of Dionýz Štúr, Slovakia)
Coffee break	
14:40 – 15:00	Acid gas storage in the natural gas structure of Borzecin-Poland Jan Lubaś (Oil and Gas Institute, Krakow, Poland)
15:00 – 15:20	The effect of pore compressibility on CO ₂ storage capacity and EOR research in Croatia Domagoj Vulin (University of Zagreb, Croatia)

Session 6	SAFETY & PUBLIC ACCEPTANCE Chair: Marjeta Car (Geoinženiring)
15:20 – 15:40	Monitoring of CO ₂ storage – methods and challenges Salvatore Lombardi (CO ₂ GeoNet / Università degli Studi di Roma "La Sapienza", Italy)
15:40 – 16:00	NGO viewpoints on CCS: A geoscientist's perspective Niels Poulsen (GEUS, Denmark)

16:00 – 16:30	Round table discussion CCS - prospects and limitations Moderator: Vit Hladik (Czech Geological Survey)
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POSTERS

P1	Prospects of CO ₂ sequestration in serpentinites of South Lithuania Inga Stasiulaitiene (KTU, Lithuania)
P2	Potential sites for CO ₂ geological storage in Latvia Uldis Nulle , Inara Nulle (LEGMC, Latvia)
P3	CO ₂ geological storage potential in Lithuania Rasa Sliapiene (GTC, Lithuania)
P4	Economic modelling of the capture–transport–sink scenario of industrial CO ₂ emissions: the Estonian–Latvian cross-border case study Alla Shogenova , Kazbulat Shogenov (IGTUT, Estonia), Raisa Pomeranceva (LEGMC, Latvia), Inara Nulle (LEGMC, Latvia), Filip Neele (TNO, The Netherlands) and Chris Hendriks (ECOFYS, The Netherlands)

P5	CO ₂ geological storage capacity analysis in Estonia and neighbouring regions Alla Shogenova , Kazbulat Shogenov, Rein Vaher, Jüri Ivask (IGTUT, Estonia), Saulius Sliampa (GTC, Lithuania), Thomas Vangkilde-Pedersen (GEUS, Denmark), Mai Uibu and Rein Kuusik (LIMTUT, Estonia)
P6	Petrophysical, geochemical and mineralogical study of oil-bearing reservoir rocks from the Chaunoy formation (Trias, Upper Keuper, Paris basin): prospects for CO ₂ storage and Enhanced Oil Recovery Kazbulat Shogenov (IGTUT, Estonia), Jean-Pierre Prian, Severine Caritg, Hubert Fabriol, Antonin Fabbri, and Roger Jack (BRGM, France).
P7	The CO ₂ -binding by Ca-Mg-silicates in direct aqueous carbonation of oil shale ash and steel slag Mai Uibu , Rein Kuusik (LIMTUT, Estonia), Lale Andreas (LUT, Sweden), Kalle Kirsimäe (IEGTU, Estonia)
P8	Effect of ageing pre-treatment on performance of PF oil shale ash for CO ₂ sequestration in aqueous suspensions Mai Uibu , Rein Kuusik (LIMTUT, Estonia)
P9	CO ₂ trapping mineral phases in sandstone aquifers - experimental results Krzysztof Labus (Silesian University of Technology, Gliwice, Poland)
P10	Introduction of CCS - effects on Latvian energy sector. Julija Gusca , Dagnija Blumberga (Riga Technical University, Latvia)
P11	CO ₂ storage research in the Czech Republic: Fundamentals for understanding of CO ₂ migration and interaction processes Václava Havlová , P. Brůha, D. Dobrev (NRI Řež plc, Czech Republic), V. Kolečka, V. Hladík (Czech Geological Survey)
P12	Sorption and flow of CO ₂ in Polish gas shales - project CO ₂ SHALESTORE. Marcin Lutyński (Silesian University of Technology, Gliwice, Poland)
P13	Preparation for carbon capture and storage in Finland Tuija Vähäkuopus , Soile Aatos, Jarmo Kallio, Nicklas Nordbäck (GTK, Finland)
P14	Mafic rocks - inadequate feedstock for CO ₂ sequestration in Poland Malgorzata Labus (Silesian University of Technology, Gliwice, Poland)
P15	Geological and tectonic structure of Lithuania: implications Jurga Lazauskiene , Jolanta Cyziene (Geological Survey of Lithuania)
P16	Geological storage of CO ₂ in deep saline aquifers – possibilities in Sweden Linda M. Wickström , Mikael Erlström, Niklas Juhojuntti, Ulf Sivhed (Geological Survey of Sweden)

Vilnius workshop – List of participants

No	Surname	Name	Organization	Country
1	Babarskaite	Agne	KTU	Lithuania
2	Baliukevicius	Arturas	Lithuanian Geological Survey	Lithuania
3	Barbucci	Pietro	Enel - Engineering and Innovation Division	Italy
4	Bitinas	Jaunutis	Lithuanian Geological Survey	Lithuania
5	Car	Marjeta	Geoinzenirng d.o.o.	Slovakia
6	Cicinskas	Kestutis	SC Achema	Lithuania
7	Coca Stefaniak	Tomas	Fundacion Ciudad De La Energia (CIUDEN)	Spain
8	Cyziene	Jolanta	Lithuanian Geological Survey	Lithuania
9	Denafas	Gintaras	Kaunas University of Technology	Lithuania
10	Drosin	Eric	Zero Emissions Platform	Belgium
11	Gastine	Marie	BRGM	France
12	Giparas	Giedrius	Ministry of Environment, Lithuania	Lithuania
13	Gusca	Julija	Riga Technical University	Latvia
14	Hangác	Roman	Ministry of the Environment of the Slovak Republic	Slovakia
15	Hladik	Vit	Czech Geological Survey	Czech Republic
16	Ivask	Jüri	Institute of Geology at Tallinn University of Technology	Estonia
17	Jakobi	Reeli	Ministry of The Environment	Estonia
18	Jureczka	Janusz	Polish Geological Institute National Research Institute Upper Silesian Branch	Poland
19	Kallio	Jarmo	Geological Survey of Finland GTK	Finland
20	Kalvans	Andis	University of Latvia	Latvia
21	Kneppers	Angeline	Global CCS Institute	France
22	Kolejka	Vladimir	Czech Geological Survey	Czech Republic
23	Kovkhuto	Andrei	Belarusian Research Geological Exploration Institute	Belarus
24	Krieger	Wlodzimierz	Polish Geological Institute National Research Institute Upper Silesian Branch	Poland
25	Kukulskis	Arvydas	AB “ORLEN Lietuva”	Lithuania
26	Labus	Krzysztof	Silesian University of Technology	Poland
27	Labus	Krzysztof	Silesian University of Technology	Poland
28	Lazauskiene	Jurga	Lithuanian Geological Survey	Lithuania
29	Lombardi	Salvatore	“La Sapienza” University of Rome	Italy
30	Lubas	Jan	Oil and Gas Institute	Poland
31	Lutynski	Marcin	Silesian University of Technology	Poland
32	Mazurowski	Marcin	Polish Oil and Gas Company	Poland
33	Meriste	Tonis	Eesti Energia AS	Estonia
34	Mockevicius	Juozas	Lithuanian Geological Survey	Lithuania
35	Nielsen	Lars Henrik	Geological Survey of Denmark and Greenland, GEUS	Denmark
36	Nieminen	Matti	VTT Technical research centre of Finland	Finland
37	Nordbäck	Nicklas	Geological Survey of Finland	Finland
38	Nulle	Uldis	Latvian Environment, Geology and Meteorology Centre	Latvia
39	Nulle	Inara	Latvian Environment, Geology and Meteorology Centre	Latvia
40	Petersone	Andzela	Ministry of Environmental Protection and Regional Development of the Republic of Latvia	Latvia
41	Petioky	Karel	EVECO, s.r.o.	Czech Republic

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42	Petioký	Karel	EVECO, s.r.o.	Czech Republic
43	Polak - Osiniak	Dorota	Polish Oil and Gas Company	Poland
44	Polit	Jaroslav	Polish Oil and Gas Company	Poland
45	Poulsen	Niels	GEUS	Denmark
46	Radvanec	Martin	State Geological Institute of Dionyz Stur	Slovakia
47	Santos	Stanley	IEA Greenhouse Gas R&D Programme	France
48	Seidlova	Beatrix	EVECO, s.r.o.	Czech Republic
49	Shogenov	Kazbulat	Institute of Geology at Tallinn University of Technology	Estonia
50	Shogenova	Alla	Institute of Geology, Tallinn University of Technology	Estonia
51	Sidorov	Vladimir	Geological survey of Lithuania	Lithuania
52	Siliauskas	Laurynas	VU	Lithuania
53	Skwarczynski	Slawomir	Polish Oil and Gas Company	Poland
54	Sliaupa	Saulius	Nature Research Centre	Lithuania
55	Sliaupiene	Rasa	Nature Research Centre	Lithuania
56	Stabrun	Kristoffer	Norwegian Ministry of Petroleum and Energy	Norway
57	Stankevicius	Vilnius	AB Achema	Lithuania
58	Stasiulaitiene	Inga	Kaunas University of Technology	Lithuania
59	Stravinskas	Svajunas	AB "ORLEN Lietuva"	Lithuania
60	Suoninen	Esa	Fortum Oyj	Finland
61	Torp	Tore Andreas	Statoil	Norway
62	Vähäkuopus	Tuija	Geological Survey of Finland	Finland
63	Vajegaite	Vilija	KTU	Lithuania
64	Vangkilde-Pedersen	Thomas	Geological Survey of Denmark and Greenland	Denmark
65	Vasileviciute	Egle	UAB Projektu centras	Lithuania
66	Vulin	Domagoj	Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb	Croatia
67	Wójcicki	Adam	Polish Geological Institute - NRI	Poland
68	Yoshimura	Tsukasa	International Energy Agency	France
69	Zommere-Rotcenkova	Kristine	Ministry of Environmental Protection and Regional Development of the Republic of Latvia	Latvia