



## CO<sub>2</sub> Capture and Storage – Response to Climate Change

2<sup>nd</sup> Regional Workshop for CE and EE Countries

3-4 March 2009, Bratislava, Slovakia



Organised by:  
State Geological Institute of Dionýz Štúr (SGUDS)  
Meeting venue: SGUDS, Dionýz Štúr Hall  
Mlynská dolina 1, 817 04 Bratislava 11, Slovakia

## AGENDA

**Tuesday 3 March 2009**

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| 8:15-9:00 | Registration   |
| 9:00-9:30 | <p><b>Welcoming addresses (Dionýz Štúr hall)</b><br/>           Ing. Miroslav Zachar, Director General of the Geological Section,<br/>           Ministry of Environment of the Slovak Republic<br/>           Her Excellency Ms Brit Løvseth, Ambassador of Norway to the Slovak Republic<br/>           RNDr. Ľubomír Hraško, PhD, Director of the State Geological Institute of Dionýz Štúr</p> |

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| <b>Session 1</b>    | <b>INTRODUCTION TO CCS CONCEPT (Dionýz Štúr hall)</b><br>Chair: Vít Hladík (Czech Geological Survey)  |
| 9:30 – 10:00        | <p><b>Climate change, possible impacts and mitigation options</b><br/>           Milan Lapin (Comenius University in Bratislava, Faculty of Mathematics, Physics and Informatics, Slovakia)</p> |
| 10:00 – 10:25       | <p><b>Why capture and store CO<sub>2</sub> ?</b><br/>           Bjørn Utgård (Bellona, Norway)</p>  |
| <b>Coffee break</b> |   |
| 10:45 – 11:30       | <p><b>CO<sub>2</sub> capture from power plant - key challenges ahead</b><br/>           Stanley Santos (IEA Greenhouse Gas R&amp;D Programme)</p>   |
| 11:30 – 12:00       | <p><b>Principles of CO<sub>2</sub> geological storage</b><br/>           Isabelle Czernichowski-Lauriol (CO<sub>2</sub>GeoNet / BRGM, France)</p>   |
| 12:00 – 12:20       | Discussion  |

**Refreshment & poster tour**

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| <b>Session 2</b> | <b>EUROPEAN POLICY AND DRIVING FORCES (Dionýz Štúr hall)</b><br>Chair: Ludovít Kucharič (ŠGÚDŠ)              |
| 13:20 – 13:50    | <p><b>EU policy and regulations</b><br/>           Scott Brockett (European Commission – DG Environment)</p> |

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| 13:50 – 14:20       | <b>ZEP Technology Platform and European CCS Demonstration Programme</b><br>Niels Peter Christensen (Vattenfall, Denmark / ETP ZEP)   |
| 14:20 – 14:40       | <b>Carbon capture and storage in climate mitigation – a Norwegian perspective</b><br>Tone Skogen (Ministry of Petroleum and Energy, Norway)  |
| <b>Coffee break</b> |  |
| 15:00 – 15:20       | <b>The CCS case, European actions: enabling framework and flagship program demonstration plants</b><br>Claude Roulet (CO2NET / Schlumberger Carbon and Water Services, Houston, USA) |
| 15:20 – 15:35       | <b>CO2NET EAST project – CCS networking extension to new EU Member States</b><br>Vit Hladik (Czech Geological Survey)  |
| 15:35 – 16:00       | Discussion   |

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| <b>Session 3</b> | <b>CO2 GEOLOGICAL STORAGE I. (Dionýz Štúr hall)</b><br>Chair: Gyorgy Falus (ELGI)   |
| 16:00 – 16:20    | <b>Polish national programme on safe CO2 geological storage</b><br>Adam Wojcicki (Polish Geological Institute)  |
| 16:20 – 16:35    | <b>Example of a geological structure possible for CO2 storage</b><br>Ludovít Kucharič (State Geological Institute of Dionýz Štúr, Slovakia)                                 |
| 16:35 – 16:55    | <b>Theoretical approach to risk assessment in MOVECBM project</b><br>Pawel Krzystalik, <u>Piotr Rosmus</u> (Central Mining Institute – Experimental mine “Barbara”, Poland) |
| 16:55 – 17:15    | <b>Methodology for selection and qualification of sites and project for geological storage of CO2</b><br>Frøydis Eldevik (DNV, Norway)                                      |
| 17:15 – 17:35    | Discussion  |

**19:30 – 22:30 Workshop dinner**

Wednesday 4 March 2009

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| <b>PARALLEL SESSION</b> | <b>Session 4a</b>   | <b>CO2 CAPTURE (parallel session – Dionýz Štúr hall)</b><br>Chairs: Stanley Santos (IEA GHG), Constantin Sava (GeoEcoMar)          |
|                         | 9:00 – 9:20         | <b>ENCAP – five years development of enhanced pre-combustion CO2 capture technologies</b><br>Leif Brandels (Vattenfall AB, Sweden) |
|                         | 9:20 – 9:40         | <b>CACHET project</b><br>Matthew Bough (BP, UK)  |
|                         | 9:40 – 10:00        | <b>Norwegian national initiatives within CO2 capture</b><br>Maria Barrio (Gas Technology Centre, SINTEF/NTNU, Norway)              |
|                         | 10:00 – 10:20       | <b>Piloting post-combustion capture</b><br>M.R.M. (Mohammad) Abu-Zahra (TNO, the Netherlands)                                      |
|                         | <b>Coffee break</b> |  |
|                         | 10:40 – 11:00       | <b>HSE challenges with amine technology for the removal of CO2 from flue gas</b><br>Nina Aas (StatoilHydro, Norway)                |
| 11:00 – 11:20           | Discussion          |  |

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| <b>PARALLEL SESSION</b> | <b>Session 4b</b>   | <b>Mineral sequestration (parallel session – room No. 321)</b><br>Chair: Alla Shogenova (Institute of Geology, Tallinn)   |
|                         | 9:00 – 9:20         | <b>CO2 sequestration with the use of fly ash from hard coal and lignite combustion</b><br>Alicja Uliasz-Bochenczyk (Mineral and Energy Economy Research Institute of Polish Academy of Sciences, Poland)  |
|                         | 9:20 – 9:40         | <b>CO2 sequestration by mineral carbonatization: Origin of new stable products using serpentinite and their potential use in industry</b><br>Lubomír Tuček, Katarína Čechovská, Ján Derco, <u>Zoltán Németh</u> , Martin Radvanec, & Ľudovít Kucharič (State Geological Institute of Dionýz Štúr, Slovakia)         |
|                         | 9:40 – 10:00        | <b>Permanent liquidation of CO2 industrial emission via artificial carbonatization of metaperidotite, metawherlite and metawebsterite – an experimental study</b><br><u>Martin Radvanec</u> , Lubomír Tuček, Katarína Čechovská, Ján Derco & Ľudovít Kucharič (State Geological Institute of Dionýz Štúr, Slovakia) |
|                         | 10:00 – 10:20       | Discussion  |
|                         | <b>Coffee break</b> |   |

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| <b>PARALLEL SESSION</b> | <b>Session 5a</b>   | <b>CO2 GEOLOGICAL STORAGE II. (parallel session – Dionýz Štúr hall)</b><br>Chairs: Georgi Georgiev (Sofia University), Adam Wojcicki (PGI) |
|                         | 11:20 – 11:40   | <b>Norway as a CO2 laboratory</b><br>Tore A. Torp (StatoilHydro, Norway)   |
|                         | 11:40 – 12:00   | <b>Ongoing research within CO2 storage in StatoilHydro</b><br>Terje Andresen (StatoilHydro, Norway)  |
|                         | 12:00 – 12:20   | <b>Results of the EU GeoCapacity project</b><br>Thomas Vangkilde-Pedersen (Geological Survey of Denmark and Greenland)                     |
|                         | <b>Refreshment &amp; poster tour</b>  |  |
| 13:20 – 13:40           | <b>Status report on the CO2SINK project – first results of monitoring after start of injection</b><br>Hilke Würdemann (Deutsches GeoForschungsZentrum – GFZ, Germany) |  |
| 13:40 – 14:00           | <b>CO2 and EOR: Searching for an optimum</b><br>Dan Bossie-Codreanu (IFP, France)   |  |
| 14:00 – 14:20           | <b>Monitoring of CO2 storage – methods and challenges</b><br>Sergio Persoglia (CO2GeoNet / OGS, Italy)  |  |
| 14:20 – 14:40           | Discussion  |  |

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| <b>PARALLEL SESSION</b> | <b>Session 5b</b> | <b>CCS IN SLOVAKIAN CONDITIONS</b><br>(parallel national session held in Slovak language – room No.321)<br>Chair: Júlia Kotulová (ŠGÚDŠ)            |
|                         | 11:20 – 11:50     | <b>Main aspects of European CCS legislative in Slovakian conditions</b><br>Boris Antal (Ministry of Environment of the Slovak Republic)             |
|                         | 11:50 – 12:00     | <b>Slovakia – CCS demonstrable projects in national and international frame</b><br>Helena Princová (Ministry of Environment of the Slovak Republic) |
|                         | 12:00 – 12:20     | Discussion  |

**Refreshment & poster tour**

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| <b>Session 6</b>    | <b>CCS PROJECTS (Dionýz Štúr hall)</b><br>Chair: Tore Torp (StatoilHydro)  |
| 14:40 – 15:00       | <b>Experiences of Vattenfall's oxyfuel pilot plant in Schwarze Pumpe</b><br>Uwe Burchhardt (Vattenfall Europe Generation, Germany)                 |
| <b>Coffee break</b> |  |
| 15:20 – 15:40       | <b>Enel's CCS projects</b><br>Pietro Barbucci (Enel, Italy)  |
| 15:40 – 16:10       | <b>CCS European projects in FP7 coordinated by SINTEF: DYNAMIS, DECARBit and ECCO</b><br>Maria Barrio (Gas Technology Centre, SINTEF/NTNU, Norway) |
| 16:10 – 16:30       | Discussion   |
| 16:30 – 17:00       | <b>Round table discussion: CCS concept importance and limitations</b><br>Moderator: Bruno Saftic (RGNF Zagreb)                                     |

*List of posters – see next page*



### **CO2NET EAST** <<http://co2neteast.energnet.com>>

is a Co-ordination Action co-funded by the European Commission within its 6<sup>th</sup> Framework Programme for research and technological development. It is proposed as a mechanism to involve the new EU Member States and Associated Candidate Countries in the current European networking activities in the field of carbon dioxide capture and storage.

Project co-ordinator: Vit Hladik, Czech Geological Survey; e-mail: [hladik@gfb.cz](mailto:hladik@gfb.cz)

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## POSTERS

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| <b>P1</b>  | <b>Present CO<sub>2</sub> injection EOR (Enhanced Oil Recovery) activities in Hungary, and CCS opportunities of MOL in the future</b><br>Péter Kubus (MOL, Hungary)  |
| <b>P2</b>  | <b>CO<sub>2</sub> storage capacity of geological structures located within Polish Lowlands' Mesozoic formations</b><br>Radoslaw Tarkowski (Mineral and Energy Economy Research Institute of Polish Academy of Sciences, Poland)  |
| <b>P3</b>  | <b>Carbon dioxide contents in soil air for needs of CO<sub>2</sub> storage monitoring</b><br>Barbara Uliasz-Misiak (Mineral and Energy Economy Research Institute of Polish Academy of Sciences, Poland)   |
| <b>P4</b>  | <b>Projects of CCS for Polish PP unit 360 MW and using of petroleum fields</b><br>Halina Kruczek (Wroclaw University of Technology, Poland)  |
| <b>P5</b>  | <b>Adsorption of CO<sub>2</sub> on the special adsorbents</b><br>Veronika Vrbová (Institute of Chemical Technology, Praha, Czech Republic)   |
| <b>P6</b>  | <b>Geological storage and mineral trapping of industrial CO<sub>2</sub> emissions in the Baltic region: possible scenarios</b><br>Alla Shogenova (Institute of Geology, Tallinn University of Technology, Estonia)   |
| <b>P7</b>  | <b>Safety aspects of long-term geological disposal of CO<sub>2</sub>: Radioactive waste disposal experience</b><br>Václava Havlová (Nuclear Research Institute Řež plc., Czech Republic)   |
| <b>P8</b>  | <b>Modeling hydrogeochemical reactions for CO<sub>2</sub> storage in saline aquifers within the Upper Silesian Coal Basin (Poland, Czech Republic)</b><br>Krzysztof Labus (Institute for Applied Geology, Silesian University of Technology, Poland), Petr Bujok (VŠB – Technical University of Ostrava, Czech Republic) |
| <b>P9</b>  | <b>CO<sub>2</sub> geological storage options in Lithuania</b><br>Saulius Sliupa (Institute of Geology and Geography, Lithuania)  |
| <b>P10</b> | <b>Ways of carbon dioxide separation from flue gases</b><br>Pavel Machač (Institute of Chemical Technology, Praha, Czech Republic)   |
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| <b>P11</b> | <b>Sorption behaviour of methane and carbon dioxide on coal</b><br>Oldřich Příbyl (Institute of Rock Structure and Mechanics, Czech Republic)  |
| <b>P12</b> | <b>CO2 storage potential of the Visegrád group countries (Poland, Slovakia, Czech Republic, Hungary)</b><br>Júlia Kotulová (State Geological Institute of Dionýz Štúr, Slovakia), Karen Lyng Antonsen (GEUS, Denmark), Vít Hladík (Czech Geological Survey), György Falus (ELGI, Hungary), Adam Wojcicki (Polish Geological Institute) |
| <b>P13</b> | <b>Formation of the mechanisms and scientific priorities to develop technologies of trapping, transportation and sequestration of greenhouse gasses in Russian Federation in the framework of Kyoto Agreement</b><br>Alexander Ilinskyi (All-Russia Petroleum Research Exploration Institute /VNIGRI/, Russia)                         |
| <b>P14</b> | <b>Promoting CCS in Romania</b><br>Constantin Sava (GeoEcoMar, Romania)  |

#### Workshop Organising Committee:

Ludovít Kucharič - State Geological Institute of Dionýz Štúr, Slovakia

Júlia Kotulová - State Geological Institute of Dionýz Štúr, Slovakia

Vít Hladík – Czech Geological Survey, Czech Republic

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