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"CO₂ Capture and Storage - Response to Climate Change"

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Sofia University St. Kliment Ohridski (SU)

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1. Workshop report

The third awareness-raising workshop organised by the CGS Europe project was entitled “CO₂ Capture and Storage – Response to Climate Change” and focused on the Balkan and Black Sea regions. It was originally planned for spring 2013 but due to severe political turbulence, public protests and parliamentary elections in Bulgaria, the organisers decided to postpone the workshop to autumn 2013. In the end, it took place in Sofia, Bulgaria, on 25 October 2013. It was held in the premises of the Sofia University St. Kliment Ohridski (15 Tzar Osvoboditel Blvd, 1504 Sofia, Bulgaria) who hosted the event and provided excellent facilities and technical support.



Workshop venue – Sofia University St. Kliment Ohridski

59 delegates took part in the workshop, coming from 8 countries; a list of participants is provided in Annex II to this report. Representative numbers by country were: Belgium 1, Bulgaria 49, Croatia 1, Czech Republic 1, Romania 4, Slovak Republic 1, UK 2. A special invitation was accepted by Mr Bojil Dobrev, Director of the Sofia University Scientific Research Department (SU-NIS) who read an opening address.

The structure of represented stakeholders was as follows: industry (15 participants), research institutions (30 participants), ministries (5 participants), international agencies (5 participants) and public organisations (4 participants).

The Agenda of the workshop is attached as Annex I to this report. The workshop programme was subdivided into two sessions covering the major aspects of CCS:

- Session 1: CCS concept and rationale (6 oral presentations)
- Session 2: CCS policies and initiatives (5 oral presentations)



Prof. Georgi Georgiev (Sofia University) welcoming workshop participants

In addition to the oral presentation, a small poster session was organised as well. Altogether, 11 oral presentations and 4 posters were presented.

Session 1 started with an introductory talk by Vit Hladik (Czech Geological Survey) who explained the rationale of the CCS technology in the global context of climate change and greenhouse gas emissions reduction efforts. After that, Boryana Kamenova - Director of the "Climate Changes Policy" department at the Bulgarian Ministry of Environment and Water – presented on the climate policy in Bulgaria. Stanley Santos (International Energy Agency Greenhouse Gas Programme) gave two comprehensive lectures describing principles of CO₂ capture in power generation and in iron & steel industry. Bruno Saftic (University of Zagreb) completed the overview of the principles of CCS by an explanation of the basics of CO₂ storage. A presentation on the global status of CCS prepared by Angeline Kneppers (Global CCS Institute) concluded the first session. Since the speaker was unable to attend, the talk was given by Vit Hladik.

The afternoon session (Session 2) was opened with a keynote talk by Petr Petrov (European Commission, DG Research and Innovation); his presentation was devoted to the EU policies related to CCS, including the support of research & development and the new Horizon 2020 framework programme. Ludovit Kucharic (SGUDS, Slovakia) presented the CGS Europe project, its aim, structure and achievements. A talk by Constantin Sava (GeoEcoMar, Romania) introduced a vision of a CCS infrastructure for south-eastern Europe, using multimodal transport of CO₂. Georgi Georgiev (Sofia University) then provided a comprehensive overview of CO₂ storage opportunities in Bulgaria. The final talk by David Jones (British Geological Survey) was devoted to monitoring of CO₂ storage sites.

Each presentation was followed by a short discussion, which allowed the audience to ask questions of the speakers or to pose comments immediately after the talk. This arrangement contributed to the good working atmosphere that marked the whole event.



Bojil Dobrev, Director of the Sofia University Scientific Research Department (SU-NIS) reading his opening address



Distinguished speakers – Boyana Kamenova (Bulgarian Ministry of Environment and Waters) and Petr Petrov (European Commission)

The workshop was prepared by a Workshop Organising Committee comprising G. Georgiev (Sofia University), V. Hladik (CzGS) and C. Sava (GeoEcoMar). On-site organisation was arranged by Sofia University – Scientific Research Department (SU-NIS).

The official languages of the workshop were English and Bulgarian. A simultaneous translation between English and Bulgarian was provided to the participants. Presentations from the workshop will be made publically available on the CGS Europe project website.

2. Involvement of CGS Europe project participants in workshop activities

- Organising Committee – SU (Bulgaria), CzGS (Czech Republic), GeoEcoMar (Romania);
- On-site organisation – SU (Bulgaria);
- Oral presentations – CzGS (Czech Republic), UNIZG-RGNF (Croatia), SGUDS (Slovakia), GeoEcoMar (Romania), SU (Bulgaria), CO₂GeoNet – BGS (UK);
- Posters – CzGS (Czech Republic), UNIZG-RGNF (Croatia), CO₂GeoNet-BGS (UK);
- Chairing of sessions – SU (Bulgaria), CzGS (Czech Republic), UNIZG-RGNF (Croatia), GeoEcoMar (Romania).



Workshop audience listening to the explanation of CO₂ capture principles by Stanley Santos (IEA GHG)



CO₂ Capture and Storage – Response to Climate Change

Regional workshop for the Balkan and Black Sea region

25 October 2013

Sofia University 'St. Kliment Ohridski' - Rectorate

15 Tzar Osvoboditel Blvd, 1504 Sofia, Bulgaria

AGENDA

8:15-9:00	REGISTRATION
9:00-9:15	WELCOMING ADDRESS Bojil Dobrev (Sofia University, Director of the Scientific Research Dept.)
Session 1	CCS CONCEPT AND RATIONALE Chairs: Georgi Georgiev & Vit Hladik
9:15 – 9:45	Why capture and store CO ₂ ? Vit Hladik (Czech Geological Survey, Czech Republic)
9:45 – 10:05	Climate policy in Bulgaria Boyana Kamenova (Ministry of Environment and Water, Bulgaria)
10:05 – 10:50	Principles of CO ₂ capture – part 1 (power generation) Stanley Santos (IEA Greenhouse Gas R&D Programme)
Coffee break	
11:10 – 11:40	Principles of CO ₂ capture - part 2 (iron & steel, cement and chemical industries) Stanley Santos (IEA Greenhouse Gas R&D Programme)
11:40 – 12:10	Principles of CO ₂ geological storage Bruno Satic (University of Zagreb, Croatia)
12:10 – 12:40	Current status of CCS Angeline Kneppers (Global CCS Institute)

Lunch

Session 2	CCS POLICIES AND INITIATIVES Chairs: Constantin Sava & Bruno Saftic
13:40 – 14:15	EU policy and regulations on CCS Petr Petrov (European Commission – DG Research & Innovation)
14:15 – 14:30	CGS Europe project – example of European networking Ludovit Kucharic (SGUDS, Slovakia)
14:30 – 14:55	Multimodal transport of CO ₂ Constantin Sava (GeoEcoMar, Romania)

Coffee break

15:15 – 15:45	CO ₂ storage opportunities in Bulgaria and SE Europe Georgi Georgiev (Sofia University, Bulgaria)
15:45 – 16:15	Monitoring of CO ₂ storage sites David Jones (British Geological Survey, UK)
16:15 – 16:45	Plenary discussion CCS as a climate change mitigation method – current status and future Moderator: Bruno Saftic

POSTERS:

Mapping of CO₂ storage achievements across Europe

H. Rütters, F. May (BGR, Germany), V. Hladik (CGS, Czech Republic), A. Shogenova (IG TUT, Estonia), R. Martinez (IGME, Spain), I. Czernichowski (BRGM, France), B. Saftic (University of Zagreb, Croatia)

Economic evaluation of CCS technology integration into lignite subcritical power plant in the Czech Republic

M. Vitvarova, T. Dlouhy (Czech Technical University in Prague, Czech Republic), V. Kolejka (CGS, Czech Republic)

Estimating CO₂ storage capacity in regional deep saline aquifer in the western part of Sava depression (Pannonian basin)

I.Kolenkovic, B. Saftic (UNIZG-RGNF, Croatia)

CO₂ field lab - field experience with controlled releases of CO₂ at very shallow depths

D. Jones (BGS), L. Baqué (imaGeau), A. Barkwith (BGS), M. Barrio (SINTEF), M. Børreson (NGI), N. Denchik (CNRS), J. Desroches (Schlumberger), F. Gal (BRGM), J-F. Girard (BRGM), S. Hannis (BGS), G. Henry (CNRS), O. Kuras (BGS), A. Levannier (Schlumberger), E. Lindeberg (SINTEF), T. Lister (BGS), P. Meldrum (BGS), C. Monroe (BGS), A. Mørk (SINTEF), D. Neyens (imaGeau), J. Paris (CNRS), P. Pezard (CNRS), K. Royse (BGS), & P. Wilkinson (BGS)

List of participants – Sofia Workshop, 25 October 2013
1. Alexandar Vasilev - Sofia University
2. Alexandra Dudu - GeoEcoMar, Romania
3. Andreea Burlacu - CO ₂ Club, Romania
4. Angel Mitev - Commercial director AES Bulgaria
5. Anita Paskaleva - Sofia University
6. Asya Ilieva - Oil and Gas Exploration and Production <i>Plc</i>
7. Bisera Stoeva – Commercial analyzer AES Bulgaria
8. Bojil Dobrev – Director SU-NIS
9. Boryana Kamenova – Director “Climate changes” - MOEW Bulgaria
10. Bruno Saftic – University of Zagreb
11. Constantin Sava - GeoEcoMar, Romania
12. David Jones – British Geological Survey
13. Diana Panova - Sofia University
14. Dimitar Ivanov - Sofia University
15. Dimitar Popov , Technical University, Sofia
16. Eva Marinovska –Sofia University
17. Georgi Georgiev – Sofia University
18. Hristiyana Popova - Sofia University
19. Hristo Dimitrov – University of Mining & Geology
20. Ina Voislavova - Sofia University
21. Inna Dimitrova – Sofia University
22. Irena Beloreshka – Commercial expert AES Bulgaria
23. Iuliya Asenova - Oil and Gas Exploration and Production <i>Plc</i>
24. Ivaylo Bakardzhiev - Oil and Gas Exploration and Production <i>Plc</i>
25. Ivo Bozhidarov - Solvay Sodi Bulgaria
26. Krasimir Belbashev - Oil and Gas Exploration and Production <i>Plc</i>
27. Krassimir Dimitrov - Sofia University
28. Ludovit Kucharic – SGUDS, Slovakia
29. Maria Manolova - Sofia University
30. Nikola Delev - Overgas Inc.
31. Petr Iliev – Sofia University
32. Petr Petrov – European Commission
33. Petr Popchev – Independent analyzer Climate, Energy and Foreign policy
34. Pola Naydenova – Executive Director, DEXIA
35. Sibila Ignatova - Legal Advisor, WorleyParsons
36. Sorin Anghel - GeoEcoMar, Romania
37. Stanley Santos – IEA Greenhouse Gas
38. Stela Blagova - Overgas Inc.
39. Valeri Trendafilov - Ministry of Economy and Energy
40. Vit Hladik – Czech Geological Survey
41. Vladimir Nikolov – Sofia University
42. Yana Mateeva - Ministry of Economy and Energy
43. Krasimira Lozanova – Sofia University

44. Velka Dobrinova - Oil and Gas Exploration and Production <i>Plc</i>
45. Rossen Nikolov - Oil and Gas Exploration and Production <i>Plc</i>
46. Iulian Radev - Oil and Gas Exploration and Production <i>Plc</i>
47. Vasil Yurganchev - WorleyParsons
48. Agnessa Gerganova – Chief Expert, RES, Ministry of Economy and Energy
49. Yana Atanasova – Ministry of Economy and Energy
50. Rosen Nedyalkov – Sofia University
51. Veselin Peychev – IO Varna
52. Konstantina Lunina – PR Sofia University
53. Yordan Yordanov - University of Mining & Geology
54. Konstantin Delisivkov - BFIEC
55. Nayden Ivanov – Public expert
56. Kristina Filipova – Sofia University
57. Svetlozar Popov – Expert, retired from Oil and Gas Exploration and Production <i>Plc</i>
58. Marin Ivanov - Sofia University
59. Anton Filipov - Sofia University