



Project no.: 256725

Project acronym: CGS Europe

Project title: Pan-European Coordination Action on CO₂ Geological Storage

Instrument: Coordination and Support Action

Thematic Priority: SP1-Cooperation, FP7-ENERGY-2010-1

Deliverable D5.7

Awareness-raising workshop 2

“CO₂ Capture and Storage – Regional Awareness-Raising Workshop”

13 - 14 June 2012, Ankara, Turkey

Due date of deliverable: 31/05/2012

Actual submission date: 25/07/2012

Start date of project: 1st November 2010

Duration: 36 months

Organisation name of lead contractor for this deliverable:
METU-PAL (Middle East Technical University)

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Version 3 – final

Project co-funded by the European Commission within the Seventh Framework Programme

Dissemination Level * : PU

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Workshop report

The second CGS Europe CCS-awareness-raising workshop entitled “CO₂ Capture and Storage – Regional Awareness Raising Workshop” took place in Ankara, Turkey, on 13 - 14 June 2012. It was organised and hosted by the Middle East Technical University (METU) Cultural and Convention Center. The workshop was the 4th event in the series related to CCS and CO₂ storage in the context of climate change organised in Turkey since 2006. The last two events, a national seminar entitled “Climate change and CO₂ emissions in Turkey, mitigation plans and need for CCS” in December 2011 and this workshop, are results of the CGS Europe project.

The announcement of the meeting was distributed through CGS Europe dissemination channels, including project website, the “CO₂ depolama” website of METU-PAL (Petroleum Research Center), as well as a mass mailing campaign using the Turkish Union of Chambers and Commodity Exchanges (TOBB) address list. In addition, the workshop was announced in the Carbon Capture Journal Newsletter and on the ENeRG website. The workshop programme was designed with the primary goal to attract the industry, academia and decision makers in Turkey. In particular, the review of capture technologies was a topic requested by the industry, and this request was fully reflected in the programme.



METU Convention Center – workshop venue

The workshop began with an opening speech by the President of the Middle East Technical University, Prof. Dr. Ahmet Acar. The first-day morning session started with the overview of the CGS Europe project. Later on, the energy outlook of Turkey with emphasis on CO₂ emissions, impact, vulnerability and plans for adaptation to climate change was discussed. An overview of capture technologies for thermal power plants was given by Prachi Singh of IEAGHG.

Geological storage of CO₂ in unconventional reservoirs and aquifers was discussed by Turgay Ertekin of PennState University, USA and Çağlar Sınoy of METU-PAL.

Turkey, being an EU Candidate Country, is in the stage of adaptation procedures. In this context, the CO₂ storage legislation has not been implemented yet. However, monitoring of CO₂ emissions from power plants and industrial installations will be documented. A related regulatory procedure is being prepared. This topic was discussed by Evren Türkmenoğlu, expert of the Ministry of Environment and Urbanisation.

The effect of excess CO₂ in the marine environment was elaborated by Ayşen Yılmaz of METU Marine Sciences Institute, with emphasis on the Black Sea and Eastern Mediterranean.

Turkey's primary policy for reducing CO₂ emissions is to increase the efficiency of operations. This was discussed in a presentation using an example from a Turkish Refinery. Capture technologies for industrial applications, namely iron & steel and cement industries - a topic of high interest of the industrial sector in Turkey – were presented by Prachi Singh.

Although storage of CO₂ in aquifers promises large storage volumes, site characterization and technology implementation require 5-8 years of development time and extensive new investment. Presently, the use of CO₂ as an enhanced oil recovery agent is considered to be readily adaptable and economically feasible. In this line, one of the world's oldest CO₂ oil recovery projects - the Batı Raman Project was presented by experts from the Turkish Petroleum Corporation.

Allan Mathieson of BP discussed the field experience and lessons learned from the In Salah CCS project. Tim Bertels discussed Shell's policy in CO₂ storage. Since stored CO₂ is expected to stay in the geologic sites for thousands of years, it is critical to monitor that it remains in the underground without any leaks. This aspect was the topic of the talk by David Jones of CO₂GeoNet-BGS. The talk was illustrated by examples from the CO₂ storage sites like In Salah, Ketzin, Sleipner, etc.

An overview talk was given by Vit Hladik (Czech Geological Survey) who summarized the current status of CCS in Europe and worldwide. Afterwards, a European Commission presentation followed, given by V. Hladik on behalf of Peter Petrov of the EC – DG Research and Innovation, who was unable to participate in the workshop due to other duties. The presentation included current EU CCS policy and support provided by the EC to CCS demonstration projects and CCS-related research & development, including new opportunities in the coming years. Broader participation of Turkish organisations and companies in European R&D activities was encouraged.

In the final talk, Tore Torp of Statoil discussed the challenges ahead of CCS and proposed how to handle the current slow development of the technology implementation.

In total, the workshop programme included 17 oral presentations, divided into 4 sessions (see Annex 1). Each session ended with a discussion block where speakers answered questions from the audience. Moreover, 7 posters showing results of CCS-related research, mostly of Turkish research institutions, were displayed in the poster area.

The presentations and posters are available on www.cgseurope.net and <http://co2depolama.labkar.org.tr>.

93 participants took part in the workshop; 15 of them being foreign guests (3 of them are students from Azerbaijan). Representatives of several ministries, academia, power plant sector, iron & steel and cement industries, the Turkish Petroleum Corporation, the Turkish Statistical Institute and several other institutions were represented at the meeting.

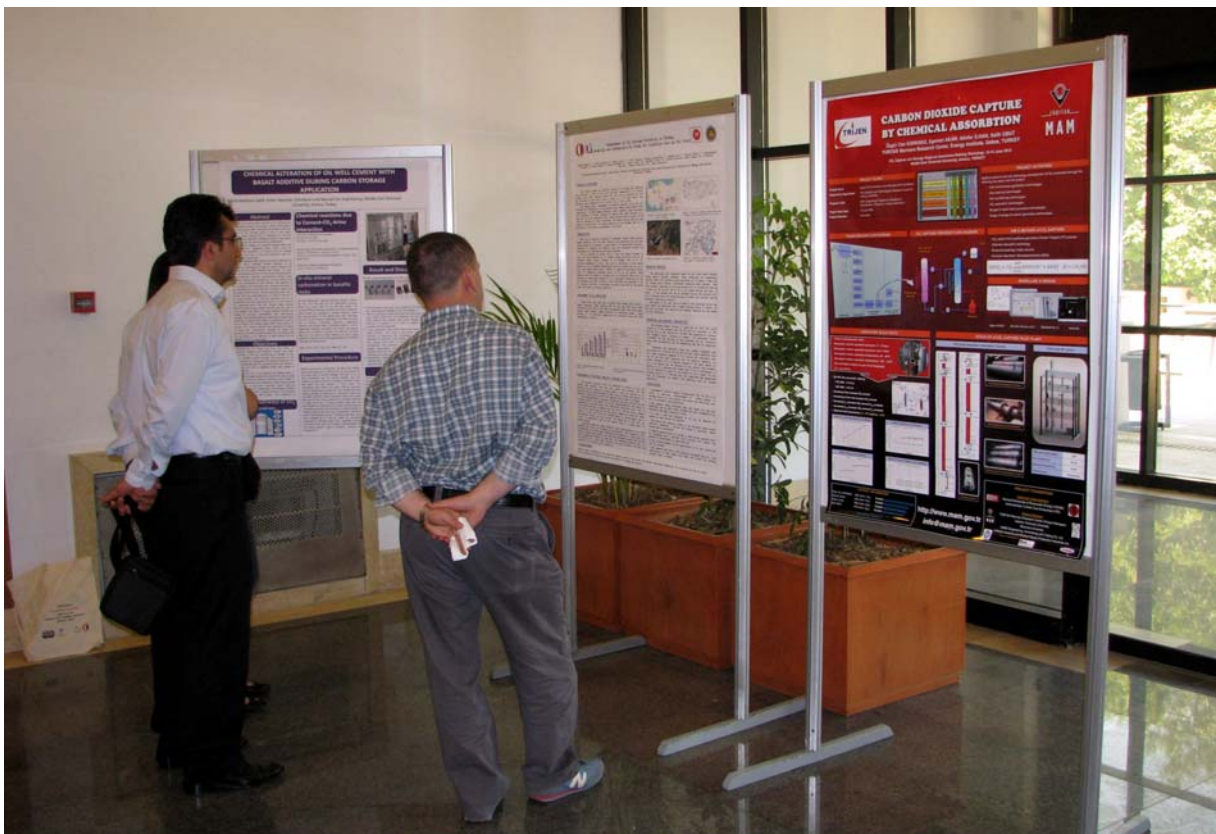


Prof. Dr. Ahmet Acar, President of the Middle East Technical University, giving the opening speech

The Organising Committee - Ender Okandan, Ilhan Topkaya, Çağlar Sımayuç and Vit Hladik - appreciate the contributing organisations who supported the travel of the speakers from their organisations. The workshop dinner and lunches were sponsored by the Turkish Chamber of Petroleum Engineers.



Workshop discussion in progress



Poster area with posters showing CCS-related research results

Annex I – Workshop agenda

Contributing Organizations	
	
	
	
	
	
	<h1>CO₂ Capture and Storage</h1> <p>Regional Awareness Raising Workshop</p> <p>CGS Europe</p> <p>“The Pan-European Coordination Action on the Geological Storage of CO₂”</p> <p>13 - 14 June 2012</p> <p>Middle East Technical University Ankara - TURKEY</p> <p>Organized by: Petroleum Research Center, Middle East Technical University</p> <p>Co-organiser: UCTEA Chamber of Petroleum Engineers</p>
CO ₂ Capture and Storage (13 - 14 June 2012)	CO ₂ Capture and Storage (13 - 14 June 2012)
13 June 2012, Wednesday	
09:00 - 09:15 Registration	09:15 - 09:30 Opening Speech, Prof. Dr. Ahmet Acar , President METU
Chair: Mahmut Parlaktuna	
09:30 - 10:00 CGS Europe Project, Ender Okandan , METU Petroleum Research Center	
10:00 - 10:30 Impact of Climate Change in Turkey - Observations and Projections, Öznur Oğuz Kuntasal , UNDP Turkey	
10:30 - 11:00 COFFEE BREAK	
Chair: Can Bakiler	
11:00 - 11:30 Turkey: Energy Outlook June 2012, Oğuz Türkyılmaz , Chamber of Mechanical Engineers	
11:30 - 12:15 CO ₂ Capture Technologies for Power Generation “The Challenges Ahead”, Prachi Singh , IEAGHG	
12:15 - 12:45 Discussion, Moderator: Can Bakiler	
12:45 - 14:00 LUNCH	
Chair: Öznur Oğuz Kanıtsal	
14:00 - 14:30 CO ₂ Sequestration in Unconventional Gas Reservoirs: Challenges and opportunities, Turgay Ertekin , PennState University, USA	
14:30 - 15:00 Deep Saline Formations: The Largest Potential Volumes for Geological Storage of CO ₂ , Çağlar Sınayuç , METU, Petroleum Research Center	
15:00 - 15:30 COFFEE BREAK	
Chair: Turgay Ertekin	
15:30 - 16:00 Natural Marine CO ₂ Sequestration: How Biological and Solubility Pumps Influence the Sequestration in the Black Sea and in the Eastern Mediterranean? Ayşen Yılmaz , METU Institute of Marine Sciences	
16:00 - 16:30 Regulations Related to Climate Change, Turkey, Evren Türkmenoğlu , Ministry of Environment and Urbanisation	
16:30 - 17:00 First Day Discussions, Moderator: Turgay Ertekin	
19:00 Workshop dinner	
14 June 2012, Thursday	
Chair: İlhan Topkaya	
09:15 - 09:45 Potential of CCS Applications in Industry ‘Steel, Oil Refining and Cement’, Prachi Singh , IEAGHG	
09:45 - 10:15 Efficiency, the Primary Target for Reducing CO ₂ Emissions, Refinery Example, Mehmet Alkan , TÜPRAŞ	
10:15 - 10:45 Requirements for Large Scale CCS Deployment, insights from Shell’s activities, Tim Bertels , Shell CCS Portfolio Manager	
10:45 - 11:15 COFFEE BREAK	
Chair: İlhan Topkaya	
11:15 - 11:45 Unique CO ₂ -EOR Experience in Batı Raman Field, Yıldız Karakeçe , Turkish Petroleum Corporation	
11:45 - 12:15 The In Salah Gas CCS Project - Key Highlights and Lesson Learned, Allan S. Mathieson , BP	
12:15 - 12:45 Discussion, Moderator : İlhan Topkaya	
12:45 - 14:00 LUNCH	
Chair: Çağlar Sınayuç	
14:00 - 14:30 Assessment of CO ₂ Storage in TPAO Fields: Applicability, Location, Capacity, Volkan Üstün , Turkish Petroleum Corporation	
14:30 - 15:00 An Overview of Monitoring Techniques for CO ₂ Storage Sites, David Jones , BGS, UK	
15:00 - 15:20 COFFEE BREAK	
Chair: Çağlar Sınayuç	
15:20 - 15:50 CCS in Europe and worldwide - current status and the way forward, Vit Hladik , Czech Geological Survey	
15:50 - 16:20 Future of CCS Technology, Moving Ahead, Tore Torp , Statoil	
16:20 - 17:00 Discussion and Closing Remarks, Moderator: Vit Hladik	

Annex II – Workshop participants

	Name	Surname	Affiliation
1	Abbas	Abbasov	Middle East Technical University
2	Hatice	Adalan	PAL
3	Cansu	Afşar	Middle East Technical University
4	Mehmet	Alkan	TÜPRAŞ
5	Altan	Aykut	TURKISH PETROLEUM CORPORATION)
6	Can	Bakiler	Middle East Technical University
7	Tugce	Bayram	Middle East Technical University
8	Serdar	Bender	TPAO
9	Tim	Bertels	Shell International
10	Mehmet	Bilgin	TTNEFT OIL AND GAS
11	Zehra	birol	Turkish Development Bank
12	Mustafa	Böyükata	Bozok University
13	Baiba	Brikmane	LEGMC
14	SEVTAÇ	BÜLBÜL	Middle East Technical University
15	Burak	CAKIR	ICTSERT DANIŞMANLIK EĞİTİM
16	HUSEYİN	CAKIR	TSE
17	Ali	CAN	Turkish Statistical Institute (TUIK)
18	CEYDA	CETINKAYA	TPAO
19	Serpil	Çimen	Türkiye Demir Çelik Üreticileri Derneği
20	Mehmet Cem	Dogan	Baştaş Cement Plant
21	CEYHUN	DURMAZ	İÇDAŞ A.Ş.
22	Berçem	ELDELEKLİOĞLU	METU PETROLEUM RESEARCH CENTER
23	Muge	Ergene	Middle East Technical University
24	Özlen	Eriçok	TPAO
25	Turgay	Ertekin	Penn State University
26	Goker	Ertunc	Middle East Technical University
27	Alessandro	GORLA	The Linde Group
28	Adnan	Görgülü	Siemens AG
29	Mustafa Erkin	Gözel	Turkish Petroleum Corporation
30	Kiymet Gizem	Gul	Middle East Technical University
31	Nilgun	Gulec	Middle East Technical University
32	PELİN	HABERAL	MINISTRY of ENERGY and NATURAL RESOURCES
33	Vit	Hladik	Czech Geological Survey
34	Pelin	HOŞHAN	TPAO Research Center Alternative Energy Sources Department
35	Mustafa	Inanli	Tuzla Jeotermal Enerji AS
36	David	Jones	British Geological Survey
37	MURAT	KALFA	TROYA ENERGY SERVICES
38	Adnan	Karabulut	Energy and Natural Resource Ministry
39	Yıldız	Karakeçe	TPAO
40	AYŞEGÜL	KARAYAZGAN	EÜAŞ
41	HARUN	KILIC	TPAO
42	Yücel	KİLİT	CIMENTAS
43	ERGÜN	KOÇ	ENERJİ VE TABİİ KAYNAKLAR BAKANLIĞI
44	AYDIN	KOLAT	Verisis Co.
45	CAGIL	KOLAT	Verisis Co.
46	Özgür Can	Korkmaz	TUBITAK MRC
47	Mehmet	Kul	Chamber of Petroleum Engineers
48	HAKKI	LAHNA	TPAO
49	Allan	Mathieson	BP Alternative Energy
50	Sukru	MEREY	Middle East Technical University

Annex II – Workshop participants

51	Tönis	Meriste	Eesti Energia AS
52	Mammad	Mirzayev	Middle East Technical University
53	OZNUR	OGUZ KUNTASAL	UNDP
54	Ender	Okandan	Middle East Technical University
55	Merve	Oztunc	Siemens Turkey
56	Oytun	Örs	Middle East Technical University
57	Rabia Tuğçe	Özdemir	Middle East Technical University
58	Emre	Özgür	Middle East Technical University
59	Ezgi	Özkılıç	Chamber of Petroleum Engineers
60	Nil	özsancak	Güriş Construction and Engineering Co. Inc.
61	Mahmut	Parlaktuna	Middle East Technical University
62	Hülya	Peker	Middle East Technical University
63	Didem Nur	SAĞLAM	METU PETROLEUM RESEARCH CENTER
64	Javid	Shiriyev	Middle East Technical University
65	KM	SIFATULLAH	Middle East Technical University
66	Çağlar	SINAYUÇ	METU Petroleum Research Center
67	Prachi	Singh	IEAGHG
68	Emrah	SOYSAL	METU PETROLEUM RESEARCH CENTER
69	Mete	Topguder	TPAO
70	Nazan	Topgüder	TPAO Research Center
71	ILHAN	TOPKAYA	Middle East Technical University
72	Tore Andreas	TORP	Statoil ASA
73	Ayşe Merve	Turanli	Middle East Technical University
74	Evren	TÜRKMENOĞLU	Ministry of Environment and Urbanisation
75	Oğuz	TÜRKYILMAZ	Chamber of Mechanical Engineers
76	Hale	ÜÇKARDEŞ	METU PETROLEUM RESEARCH CENTER
77	İrem	ÜNVER	TÜRKİYE ÇİMENTO MÜSTAHSİLLERİ BİRLİĞİ
78	AYŞE	YAVAŞ BAYINDIR	EÜAŞ
79	Fatih	Yazıtas	General Directorate of Renewable Energy TPAO Research Center Alternative Energy Sources Department
80	Ayşe	YILDIRIM	TPAO Research Center Alternative Energy Sources Department
81	BETÜL	YILDIRIM	Middle East Technical University
82	ZEYNEP BUKET	YILDIRIM	EREGLI IRON AND STEEL WORKS
83	AYŞEN	YILMAZ	Middle East Technical University
84	GAYE	YUCAYURT	METU PETROLEUM RESEARCH CENTER
85	Mutlu	Zengin	EPDK
86	Yasemin	Zengin	Cankaya University
87	Şevket Arda	Atılğan	Bozok University
88	Mehmet	Evcı	Turkish Standards Institute
89	Cengiz	Gören	Turkish Standards Institute
90	Selami	Toprak	Mineral Research and Exploration Ins.
91	Agah	Köker	Mineral Research and Exploration Ins.
92	Teoman	Sanalan	Ministry of Environment and Urbanisation
93	Fatma Betül	Baygüven	TUIK