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PETRONAS



# CCOP CO<sub>2</sub> Storage Mapping Program (CCS-M)

## CCS-M Training Course 4 (T4): National Assessment of CO<sub>2</sub> Storage Sites and CO<sub>2</sub> for EOR 27-30 May 2014, Penang, Malaysia

### A. Background and Objectives:

The CCOP Technical Secretariat in cooperation with the Global CCS Institute (GCCSI), Norwegian Ministry of Foreign Affairs, PETRAD and Malaysian partners- PETRONAS and Minerals and Geoscience Department, will be conducting the subject CCS-M T4 in Penang, Malaysia. The objectives of T4 are to have a deeper understanding of the methodologies and criteria for the selection of technically accessible CO<sub>2</sub> geological storage reservoir and the use of CO<sub>2</sub> for enhancing oil/gas recovery (EOR). The agenda will include hands-on exercises to assess and test the site selection criteria and storage estimation procedures. Invited resource persons will be coming from Australia, Norway and CCOP member countries.

### B. Participants and Resource persons:

1. Representatives from oil and gas regulatory and supervisory agencies, research organizations, national oil and gas companies, geological agencies, environmental agencies, and academic institutions of CCOP member countries and ASCOPE members.
2. Resource persons from Norway, Australia, and CCOP member & cooperating countries.

**C. Date & venue:** Penang, Malaysia – 27-29 May 2014 and field trip on 30 May 2014.

### D. Implementing / coordinating organizations

1. CCOP Technical Secretariat
2. Global CCS Institute
3. PETRAD, Norwegian Petroleum Directorate and Ministry of Foreign Affairs - Norway

4. PETRONAS and Geoscience and Minerals Department, Malaysia

**E. Draft Program:**

#	Time	Item	Person/Organization
1	26 May	Arrival of participants/resource persons	CCOP TS/PETRONAS
<b>Day 1: 27 May 2014</b>			
2	0830	Registration	CCOP TS/PETRONAS
3	0900	<p>Opening Ceremony</p> <p style="padding-left: 40px;">1. Welcoming Remarks</p> <p style="padding-left: 80px;">a. CCOP Technical Secretariat</p> <p style="padding-left: 80px;">b. PETRONAS</p> <p style="padding-left: 40px;">2. Opening Remarks</p> <p style="padding-left: 80px;">a. Malaysia</p> <p style="padding-left: 40px;">Exchange of Tokens</p>	<p>CCOP TS</p> <p>Dr. Adichat Surinkum Director, CCOP Technical Secretariat</p> <p>Dr. Oystein Berg Special Adviser PETRAD, Norway</p> <p>Dato' Yunus Abdul Razak Permanent Representative of Malaysia to CCOP Director-General, Mineral and Geoscience Department Malaysia</p>
4	0930	<p>Keynote Address</p> <p><i>Sharing the Norwegian Experiences in Sustainable Petroleum Resource Management to ASCOPE and CCOP</i></p>	Dr. Øystein Berg Special Adviser PETRAD, Norway
	1000	Group Photo / Coffee - Tea	CCOP TS
5	1030	Introduction, Background and Update of CCS-M	Mr. Simplicio P. Caluyong <i>CCS-M Coordinator</i> <i>CCOP Technical Secretariat</i>
6	1050	General Overview of CCS: <i>geological storage and EOR</i>	Dr. Helge Hellevang Professor, University of Oslo, Norway
7	1130	Selection of Geological Storage of CO <sub>2</sub> and Storage Capacity Assessments	Mr. Rick Causebrook General Manager Australian National Low Emissions Coal Research &

			Development (ANLECRD)
	1215	Lunch	
		<p>The <b>Workshops in CCS-M T4</b> will be conducted as hands-on exercises* using established methodologies and focusing on 1) storage site selection and characterization and 2) geological storage capacity estimation. A Group of 3-4 members will work with actual data with assistance from resource persons. Each group will be required to make a presentation at the end of each workshop session.</p> <ul style="list-style-type: none"> <li>• Introduction to the workshop</li> <li>• Data analysis</li> <li>• Questions and answers</li> <li>• Group presentation</li> </ul> <p><i>*All participants are requested to bring a ruler and calculator for the exercises.</i></p>	All participants
8	1330	Workshop (1): Geological Storage Site Selection	All participants
	1500	Coffee / tea break	
	1530	..Continue with Workshop 1	All participants
9	1630	Group presentations	
	1700	Summary for Day 1	Chair
10	1830	Welcome dinner <i>Attire: Smart Casual</i>	Host: Malaysia <i>(venue: TBC)</i>
<b>Day 2: 28 May 2014</b>			
11	0830	Overview of Day 1 and Order of the Day	Chair: Sim Caluyong
12	0840	Introduction to Workshop 2: Geological Storage capacity estimation- <i>probabilistic calculation</i>	<i>Resource persons</i>
	0900	Workshop (2): Geological Storage capacity estimation- <i>probabilistic calculation</i>	All participants
	1000	Coffee/ tea break	
13	1030	..continue with Workshop 2 Group Presentation	All participants
14	1120	<i>Case study: Mapping of geological storage potential, use of CO<sub>2</sub> and monitoring.</i>	Mr. Fridtjof Riis Senior Geologist Norwegian Petroleum Directorate, Norway

	1200	Lunch	
15	1300	Workshop (3) – Geological Storage capacity estimation- <i>deterministic calculation</i> <ul style="list-style-type: none"> <li>• <i>Break out session</i></li> <li>• <i>Discussions</i></li> <li>• <i>Group presentation</i></li> </ul>	All participants
	1500	Coffee/ tea break	
16	1530	Case studies: <i>Assessment of storage potential and estimation of storage capacities</i> <ul style="list-style-type: none"> <li>• <i>Discussion – why the need for a standard methodology?</i></li> </ul>	Dr. Steve Whittaker Principal Geologist CSIRO, Australia
17	1630	Summaries for Day 2	
		Day 3: 29 May 2014	
18	0830	Order of the Day	Chairperson
19	0840	Workshop 4: CO <sub>2</sub> site selection and capacity estimation – <i>building on previous workshops- looking into other considerations</i> <ul style="list-style-type: none"> <li>• <i>Discussions on the Draft CCOP Guideline – Methodologies for selecting Geological storage sites and estimation of capacities.</i></li> <li>• <i>Group presentation</i></li> </ul>	Resource persons
	1000	Coffee/ tea break	
20	1030	The North Sea Central Storage Initiative - <i>Large scale storage and potential future of EOR</i>	Dr. Helge Hellevang University of Oslo Norway
21	1115	Methodology for the evaluation of CCS reservoir in Japan	Dr. Kinichiro Kusunose Geological Survey of Japan NAIST, Japan
	1200	Lunch	
22	1330	Update on CCS-related projects in Korea with emphasis on site screening/characterization	Dr. Jeong Chan Kim KIGAM, Korea
23	1400	United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC – 2009): a tool for sustainable development <ul style="list-style-type: none"> <li>• <i>Development of draft specifications for the use of UNFC-2009 to classify injection</i></li> </ul>	Mr. Sim Caluyong CCOP TS

		<i>projects</i> <ul style="list-style-type: none"> <li>• <i>Comparison of Classification systems</i></li> </ul>	
24	1430	CCS-M: the way forward <ul style="list-style-type: none"> <li>• <i>Upcoming training course (T5)</i></li> <li>• <i>Case studies implementation</i></li> <li>• <i>Summary and discussions</i></li> </ul>	Mr. Sim Caluyong CCOP TS
	1500	Coffee/ tea break	
25	1530	Briefing on the Field trip	Malaysia
26	1545	Evaluation Awarding of Certifications Closing Ceremony	CCOP TS and PETRAD
	1630	End of CCS-M T4	
27	1830	Farewell dinner Attire: Smart Casual	Host: CCOP TS (venue: TBC)
28	0800- 1600	Day 4: 30 May - Field Trip	CCOP TS/Malaysia