
CCOP CO₂ Storage Mapping Program (CCS-M)

Training Course 4 (T4): National Assessment of CO₂ storage sites and CO₂ for EOR

Penang, Malaysia 27-30 May 2014

Summary Report

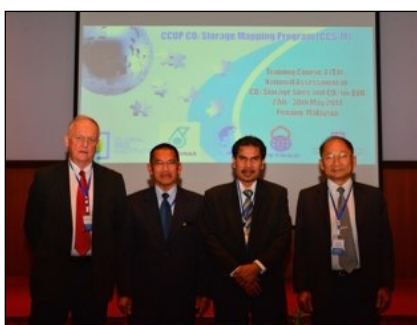


S U P P O R T E D B Y



Introduction

The CCOP Technical Secretariat (CCOP TS) in cooperation with the Global CCS Institute, Norwegian Ministry of Foreign Affairs (MFA), PETRAD and Malaysia partners - PETRONAS and Minerals and Geoscience Department (JMG) successfully conducted the CCS-M T4 in Penang, Malaysia on 27-30 May 2014. The objectives of T4 are to have a deeper understanding of the methodologies and criteria for the selection of technically accessible CO₂ for enhancing oil/gas recovery (EOR). The agenda included hands-on exercises to assess and test the site selection criteria and estimation procedures led by resource persons from Australia (CSIRO and ANLECRD), Norway (NPD and PETRAD) and CCOP member countries, notably Korea (KIGAM), Japan (GSJ) and Malaysia (PETRONAS).



A total of 47 actively participated in T4 - majority geoscientists from regulatory agencies, geological organizations and national oil & gas companies of Cambodia, China, Indonesia, Japan, Korea, Lao-PDR, Philippines, Thailand, Vietnam and Malaysia, the host country. The number also includes the staff from the CCOP TS.

Opening Ceremony and the Keynote Address

The welcoming addresses were delivered by Dr Adichat Surinkum, Director of CCOP TS and Mr Azhar Bin Yusof, General Manager of PMU, PETRONAS, while the opening remarks by Dato' Yunus Bin Abdul Razak, Director General of JMG and Permanent Representative of Malaysia to CCOP. Dato' Yunus also officially opened the CCS-M T4 with the key message of encouragement for all the participants to use the event as a collaborative meeting in order to forge a stronger and more dynamic cooperation among member countries of CCOP and with Cooperating organizations, that will be key to the success of the CCS-M Program. The keynote address was delivered by Dr Oystein Berg, former Managing Director of PETRAD, Norway, that focus on the long cooperation

between CCOP and Norway that goes back to the early 80's. The sustained partnership helped in the capacity building of many member countries, particularly in the area of oil and gas resource management.

Lectures and Workshops

The resource persons of the CCS-M T4 were as follows:

1. Dr Oystein Berg - former Managing Director of PETRAD (currently a Special Adviser)
2. Mr Rick Causebrook - Geologist and General Manager of Australian National Low Emissions Coal Research & Development (ANLECRD)
3. Dr Steve Whittaker - Principal Geologist, Research Scientist, Commonwealth Scientific and Industrial Research Organisation of Australia (CSIRO)
4. Dr Helge Hellevang - Researcher, Department of Geosciences, University of Oslo, Norway
5. Mr Fritdjof Riis - Senior Geologist, Norwegian Petroleum Directorate (NPD)
6. Ms Rita Sande Rod - Geologist, NPD.

The T4 agenda focused on the topics related to the methodologies on selection of geological storage of CO₂ and storage capacity estimation. The lectures were supported with various CCS case studies from Norway, Australia, North America and experiences on storage selection procedures from KIGAM and GSJ.

The four (4) workshops were conducted as hands-on exercises using established methodologies on 1) storage site selection and characterization, 2) storage capacity estimation, and 3) CCOP Guideline parameters. One of the important outcome of the workshops were the discussions and agreement by the member countries on the parameters in the CCOP Guideline on the Methodologies for Selecting Geological CO₂ Storage and Estimation of Storage Capacities, a key outcome of the CCS-M Program. The said Guideline will give a brief overview of the current status of storage capacity assessments per CCOP country, provide some details regarding the development of the Guideline, such as workflow and adopted capacity estimation calculation methods. The Guideline will also introduce how the Guideline will be implemented in each member country and reviewed.

Key Outcomes

The following consensus were reached by the participants as key parameters in the CCOP Guideline:

1. Type assessment and coverage - Onshore and offshore areas
2. Scale: High level assessment (basin scale, reservoir-seal pair existing below ~800 m)
 - A. Saline aquifers
 - B. Depleted hydrocarbon (oil and gas) fields
3. Estimation methods: Probabilistic (deterministic method is used if sufficient data is available and/or basin is considered mature.
4. Use of Geographic Information System (GIS) to locate storage sites, identify the lithology, and estimated capacities.
5. Not to include in the storage assessment the areas that are known to contain potable water and those within an area of potential petroleum migration.
6. Support from Member Countries - public domain data and expertise (if available).

A 1-day field trip was organised by PETRONAS with stops at some of the interesting geological and tourism sites in Penang Island, including the Penang Hill and the Island's famous Fruit farms.

