

Chapter 5

Workshop on the Model Case Study

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Chapter 5

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1. Overview

Based on the outcome of the model case study (MCS), including cost analysis, regulatory and policy frameworks, and regional institutional and policy proposals were presented to stakeholders of the ACN members on 18 January 2022. In addition to the report on the MCS outcome, four panellists from various backgrounds (government, industry, academic, and financial industries) were invited to exchange ideas on possible scenarios for project development in ASEAN.

2. Agenda

Table 5.1: Agenda of Model Case Study (MCS) Workshop

	Topic	Presenter
1	Welcome address and introduction to Asia CCUS Network and its 2021 activities	Shigeru Kimura, Special Advisor on Energy Affairs, Economic Research Institute for ASEAN and East Asia (ERIA)
2	Outcomes of MCS, cost analysis, and policy proposal	Ulysses Coulmas, Researcher, Mitsubishi Research Institute (MRI) Ayami Saimura, Researcher, MRI
3	Panel Discussion Topics will include the following: 1) CAPEX/OPEX reduction potential 2) Policy/legal requirement 3) Regional cooperation approach 4) Further project development needs towards commercialisation 5) Findings from model case exercise Moderated by Kikuko Shinchi, Senior Researcher, MRI	1) Yoshihiro Sawada, Corporate Adviser, General Manager of International Affairs Department, Japan CCS Co., Ltd. 2) Mohammad Rachmat Sule, Lecturer, Faculty of Mining and Petroleum Engineering, Institut Teknologi Bandung 3) Jinmiao Xu, Energy Specialist, Energy Sector Group, Sustainable Development and Climate Change Department, Asian Development Bank 4) Yukimi Shimura, Director, Planning & Development

		Department, Sustainable Business Division, MUFG Bank, Ltd. 5) Ulysses Coulmas, Researcher, MRI
4	Closing remarks	Han Phoumin, Senior Energy Economist, ERIA

3. Main Topics of Discussions

As discussed in the MCS in previous chapters, a collective effort is needed to push CCUS forward. But, first, the barriers that could be overcome and the effort that could be made by all parties involved had to be understood and made known to the public. A few topics and issues raised are as below.

- **Cost reduction through scaling up and learning by doing**

According to the JCCS' study of the Tomakomai demonstration project in Japan, based on the assumption of 25 years' operation, the unit price of 200,000 t/year of capacity model is calculated, excluding pilot and demonstration facility. Then, the 200,000 t/year is scaled up to 5 times, which is 1,000,000 t/year, and the model is further calculated.

The result, the unit cost of 200,000 t/year of capacity model, is 123 US\$/t-CO₂ while the unit cost of 1,000,000 t/year of capacity model costs US\$67/t-CO₂. This implies that with scaling up of capacity to five times more, the unit cost is reduced to half. This has proven that scaling up is important in cost reduction.

For reference, a study of unit costs for a full-chain project in Norway estimated that the cost of storing 1.5 million t/year would be more than US\$100/t-CO₂, and the cost of storing 300 million t/year would be less than US\$30/t-CO₂. In other words, scaling up is important.

The CO₂ capture cost accounts for 76% of the total cost in Tomakomai's case, indicating that reducing the capture cost is important in lowering the CCS cost. The MRI study results also show that the capture cost is approximately 70%, in the same range as the JCCS cost study. Technological innovation is needed to reduce the recovery cost. Also, in this study, the operating cost is huge compared to the capital cost because fuel and electricity prices are commercial prices. If the energy produced in the facility could be used, the operating costs would be much lower.

The importance of scaling up and reducing CO₂ capture costs to reduce the cost of CCS is indispensable. Still, another thing to emphasise is the importance of cost reduction through experience or learning-by-doing. Without experience, there is a possibility of over-equipping and inappropriate planning and design.

- **Policy and legal framework**

From the private sector's perspective, it may be preferable to have a common guideline, and that would be helpful for project development if we were to consider regional hub and cluster. It is also essential that stakeholders, such as banks and corporations, be included in the regional framework. Also, demonstration projects in Asia should be increased to provide lessons to be learnt. Incentive schemes to enable the bankability of projects should include carbon credits. Green finance schemes should also be developed and promoted further in the region.

Indonesia, together with ADB, had developed a legal framework in 2019. A new draft is currently being prepared by the Ministry of Energy and Mineral Resources of Indonesia. New aspects expected to be included are a measurement of CO₂ and ways to monetise CO₂.

Although several well-established CCUS-related legal frameworks in developed countries can be used as a reference, none of them can be replicated as in Asia and ASEAN specifically. Starting projects in the oil and gas sector, where legal jurisdiction is slightly clearer, helps regulatory framework development.

- **The obstacles in developing a bankable scheme**

There are still many unknowns in terms of the responsibilities of stakeholders in CCUS. For example, some regulatory issues can be covered in the existing framework even in Asia, but the responsibility is still not clear in many aspects. However, there is no precedence for financial institutions to judge in case of unexpected events, making financing CCUS projects a hard decision to make.

Government commitment is also important. Government subsidies play an important part in developing CCUS. The long-term commitment by the government may be the key to ensuring confidence for the private sector when making its decisions.

- **The need for more capacity building and sharing of experience**

Capacity building should be increased. The decade-long collaboration between Indonesia and Japan and technical feasibility studies can advance project development. The priority on joint work should be on storage capacity determination. Sharing experience and learning would lead to increased confidence of investors and other stakeholders of CCUS in the region.