# Chapter 4

# Potential of Carbon Capture, Utilisation, and Storage Deployment in ASEAN and East Asia

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# Chapter 4

# Potential of Carbon Capture, Utilisation, and Storage Deployment in ASEAN and East Asia

## 1. Current issues with carbon capture, utilisation, and storage deployment in the Association of Southeast Asian Nations region

As part of this research project, a session entitled 'CCUS – Current Situation and Future Perspectives' was held as part of the ERIA-sponsored 3rd East Asia Energy Forum (EAEF) on 17 November 2020, where various issues including the legal framework required for CCUS and possible business models were introduced, and current interest and issues on commercialisation faced by governments, academia, and the private sector as well as financial institutions were discussed.

**Box 3. Programme of Session 2, 3rd EAEF**

**Opening of the session – Objective, discussion topics, and the expected outcome**

*by Mr. Ulysses Coulmas, Researcher, Mitsubishi Research Institute*

**Keynote speech**

**1. 'CCUS promotion through policies'**

Status of public policy and legal framework in CCUS-ready countries and ramifications for Asian countries

*by Mr. Ian Havercroft, Senior Consultant - Legal & Regulatory, Global Carbon Capture and Storage Institute (GCCSI)*

**2. 'Global trend in CCUS business cases' – Introduction of advanced business models**

*by Ms. Kikuko Shinchi, Senior Researcher, Climate Change Solutions Group, Sustainability Division, Mitsubishi Research Institute (MRI)*

**Introduction of 'case studies in ASEAN and creating a successful business model through partnership'**

1. Introduction of CCUS-EOR and $CO_2$ pipeline project development in Indonesia

   *by Dr. Toshiyuki Anraku, Vice President of Technical Division, Japan Petroleum Exploration Co., Ltd.*

2. Introduction of CCUS and power generation development project in Indonesia

   *by Dr. Yucho Sadamichi, Consultant, Environmental Consulting Department, JAPAN NUS Co., Ltd.*

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|---|
| **Break** |
| **Panel discussion: 'Towards acceleration of CCUS promotion in Asia/ASEAN through partnership'**<br>1. Mr. Hoang Van Tam, Deputy Head of Climate Change and Green Growth Office, Ministry of Industry and Trade, Viet Nam<br>2. Dr. Zhong Sheng, Research Fellow, Energy Studies Institute, National University of Singapore<br>3. Ms. Dewi Mersitarini, Advisor of CCUS Upstream Innovation, PT. Pertamina (Persero), Indonesia<br>4. Mr. Jinmiao Xu, Energy Specialist, Energy Sector Group, Department of Sustainable Development and Climate Change, Asian Development Bank (ADB)<br>5. Ms. Yukimi Shimura, Director, Sustainable Business Office, Solution Products Division, MUFG Bank<br>6. Mr. Juho Lipponen, Coordinator, Clean Energy Ministerial (CEM)<br>7. Mr. Yukihiro Kawaguchi, Director, Global Environmental Affairs Office, Ministry of Economy, Trade and Industry of Japan<br>*(Moderator: Kikuko Shinchi, MRI)* |
| **Closing remarks**<br>by Prof. Hidetoshi Nishimura, President, ERIA |

According to the discussion, there are three pillars of issues with CCUS deployment in ASEAN and East Asia region:

a. Knowledge sharing and management promotion
b. Risk management approach (for technological and financial aspects)
c. Obtaining practical experience with concrete projects

For knowledge sharing and management promotion, there was an opinion in the session that technological experience is vital for CCUS dissemination, and regional and international collaboration is needed. In terms of technology, it was mentioned that there are diverse technological portfolios in each country in Asia. Therefore, it will be desirable to bridge the differences whilst being conscious of the differences in each technology experience.

Regulatory, institutional, and geological aspects of knowledge should also be shared in the region. For the geological aspect, $CO_2$ storage site mapping in Asia should be further explored and shared, for which it is necessary to consider the $CO_2$ storage projects described in the previous chapter.

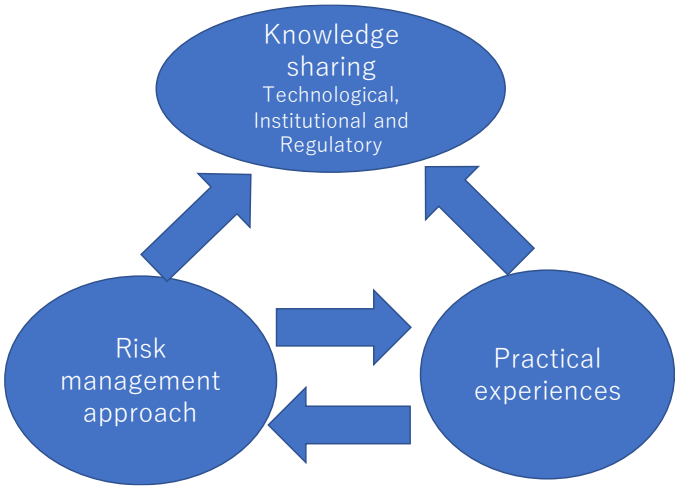
The second pillar discussed in the session was the risk management approach. On the technological aspect, there were plenty of discussions on risk management for addressing the $CO_2$ containment responsibility. As written in the previous chapter, it is necessary to address the risk of seepage from the storage formation for $CO_2$ storage projects, and this imposes correspondence of more than a couple of decades. It is necessary to mitigate the duty imposed on the project owner by risk-sharing and so on.

Risk management is a keyword also related to the financial aspect. It will be desirable to establish methods to assess the CCUS risks financially to make decisions for the financial sector.

The third pillar is related to obtaining practical experience with concrete projects. Concrete project development is vital to identify practical issues in implementing CCUS. As discussed in the symposium, a regulatory framework should be considered with a project-oriented manner in the beginning stages.

These three pillars and their mutual relationships are shown in Figure 4.1. In addition, business model development, cost reduction methods, and any approaches to implementing CCUS are thought to be derived from concrete projects. With this thought, it is desirable to set up diverse pilot projects suitable for the context in the Asian region.

**Figure 4.1. Speculative Issue Structure for CCUS Deployment in the ASEAN Region**

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## 2. Prospectives based on partnerships – Outcome from the 3rd EAEF

The proposed Asian regional CCUS network is expected to complement existing international cooperation frameworks, such as the Carbon Sequestration Leadership Forum (CSLF) and Clean Energy Ministerial (CEM). The CSLF is technologically oriented, whilst the CEM is more focused on policy proposals and business model creation. Although both focus on international cooperation, of the ASEAN and East Asian countries, only China, Japan, and the Republic of Korea are members of the CSLF, whilst the same three countries plus Indonesia are members of the CEM. As raised in the EAEF session, even countries with little or no emphasis on CCUS seek knowledge sharing in their post-2030

consideration of their decarbonisation strategies. The proposed Asia CCUS network is expected to adopt a grassroots approach, involving countries that have yet to take an active stance on CCUS.

Bearing in mind the supplementation of the existing framework and issues identified in the previous section, three activities are identified as having the potential of promoting CCUS through the Asian regional network.

**Open technological platform**

Activities for the identification of technological issues and knowledge sharing are taking place to some extent through existing international initiatives. However, technological capacity development and dissemination takes time and requires intensive involvement. In this context, the Asian regional network may have the potential to supplement and accelerate existing technology cooperation. One example of CCUS technology capacity development would be the open source of technological knowledge and human resource exchange.

**Policy suggestions and a problem-solving platform**

In order to develop concrete CCUS projects, it is necessary to address the practical issues faced in individual countries. These could not be solved without intensive cooperation and information exchange to implement concrete policies and problem-solving in actual projects. The Asian regional network could offer an intensive cooperation platform amongst policymakers, project developers, technology providers, and financial institutions to exchange views to overcome practical issues. Working groups and meetings can be held to facilitate discussions on legal frameworks and policy development, risk mitigation, and bankability, etc.

**Demonstrating concepts through pilot projects**

Once the issues and their possible solutions are identified through working groups and meetings, they need to be tested to implement fine-tuning towards commercialisation. The proposed regional network can support such pilot projects through identifying storage sites and fostering collaboration amongst technology providers, policymakers, and financial institutions.

**Drawing shared visions for CCUS in Asia**

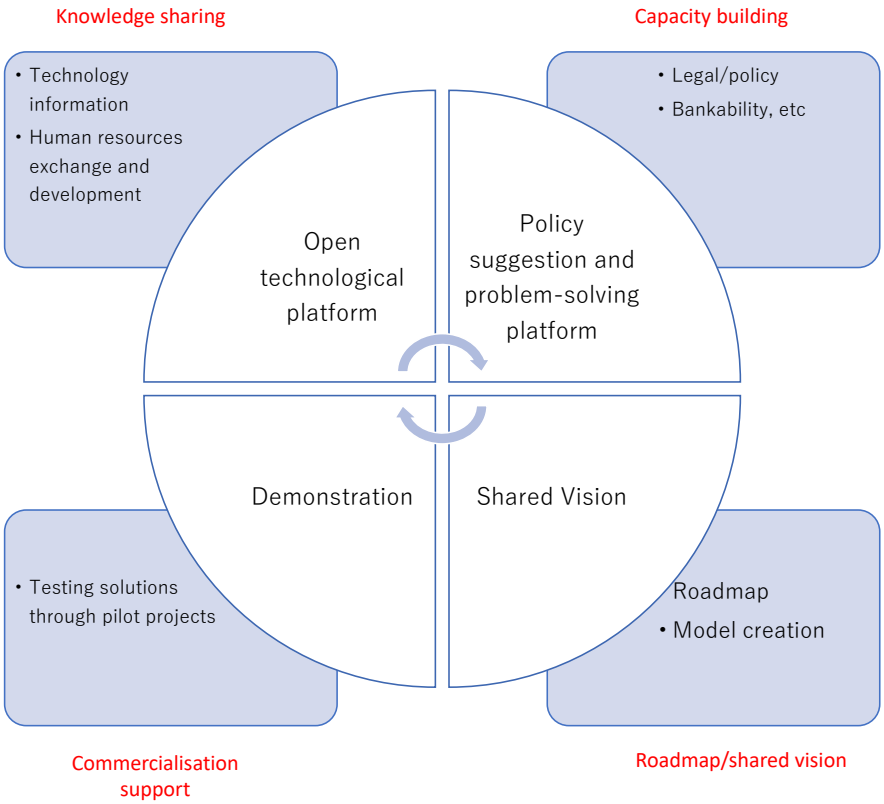
Last but not the least, it is important to have shared visions for such a large-scale technology as CCUS. Shared objectives and directions will facilitate swifter international understanding, cooperation, and communication.

One example of a shared vision could be to develop an industrial hub and cluster where the required technological and institutional knowledge components for CCUS are accumulated. Having a physical network of $CO_2$ collection, transport, and storage could be another example for a shared vision as seen in Norway's Northern Lights project and the Northern Endurance Partnership of the United Kingdom in Europe. It is hoped that a roadmap for achieving the shared vision is designed and agreed at the launching of the Asia CCUS Network.

**Progressive cycle of the Asia CCUS Network**

In addition, actions should be implemented in a consistent manner. Work programmes under the Asia CCUS Network are best constructed being conscious of the progressive cycle as shown in Figure 4.2.

**Figure 0.2. Conceptual Image of the Functions of the Asia CCUS Network**

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