

Japan CCS Forum 2022  
1 December 2022  
Hybrid Forum

# Asia CCUS Network as a Platform for Development and Deployment of CCS/CCUS in Asia Region

*Shigeru Kimura*

*Special Adviser to the President on Energy Affairs*

[www.eria.org](http://www.eria.org)

Economic Research Institute for ASEAN and East Asia



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# The First Asia CCUS Network Forum

- Announcement of the launch of ‘the Asia CCUS Network’, an international industry–academia–government platform aimed at knowledge sharing and improvement of the business environment for utilisation of carbon capture, utilisation, and storage (CCUS) throughout the Asia region. Thirteen East Asia Summit (EAS) member countries and more than 100 companies, research institutions, and international organisations have so far expressed their intention to participate in the network.
- Congratulatory messages from EAS Ministers and keynote speeches by International Organizations like the IEA. Introduction about Japan's initiative on CCUS Showcase, report on the network's working plans, also panel discussions on “Expectations to ACN”, “Promoting private investment into CCUS with government support” and “Financing scheme for CCUS”

## 1. Event details

- Date : 22-23 June 2021
- Venue : virtual room
- Host : METI, ERIA

## 2. Programme

22 June

- Opening session (ERIA, METI)
- Ministerial session (9 Ministers of EAS Member Countries)
- Keynote speeches by IEA, GCCSI and OGCI
- Panel discussion 1 (Expectations to Asia CCUS Network)

23 June

- ACN's work plan by ERIA
- Japan's CCUS showcase (transportation, Gundih CCUS project, storage technology)
- Panel discussion 2 (CCUS private investment and expectation towards government)
- Panel discussion 3 (CCUS financing scheme)



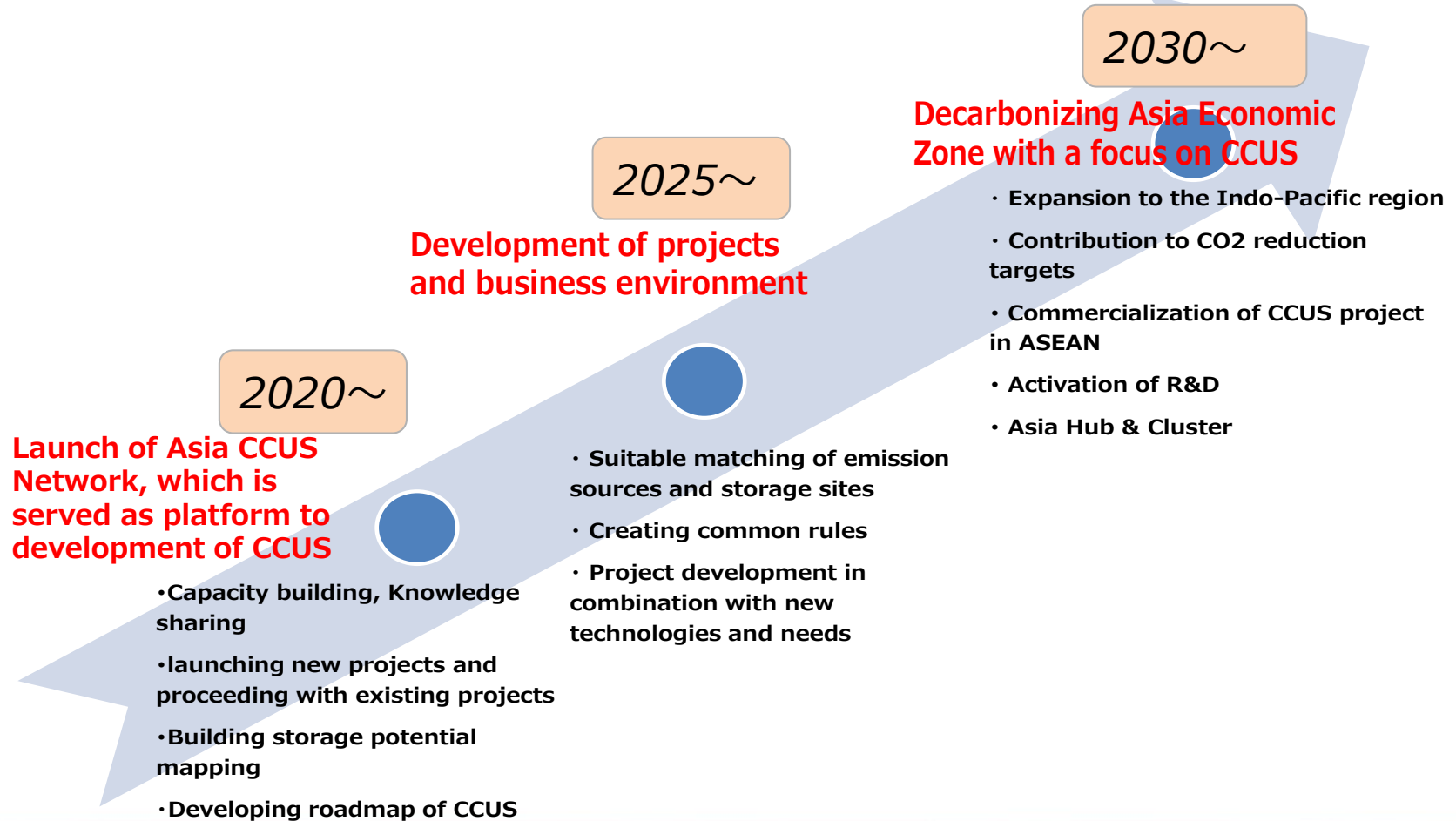
## 3. Participants

- Speakers : 37
- Audience: about 600

# Asia CCUS Network

- **Vision**

- Through collaboration and cooperation on development and deployment of CCUS in EAS region, the Network will contribute decarbonization of the region.



# Asia CCUS Network

- **Missions**

- Facilitate deployment of CCUS in EAS region through following activities;

- Promote **knowledge sharing** through holding annual forum, conferences, workshops and meetings
    - Conduct **research studies** on technical, economical and legal standard of CCUS
    - Holding **capacity building trainings**

# Asia CCUS Network in 2021-22

## • Knowledge Sharing Conference

- **1<sup>st</sup> KS conference on 26 July 2021:** ACN invited experts from IEA to share recent publication on “CCUS: The Opportunity in Southeast Asia”.
- **2<sup>nd</sup> KS conference on 28 July 2021:** ACN invited experts from the US Department of Energy to share their insights and experiences on CCUS development in terms of project development, regulatory framework, and other policy environment under President Biden's administration.
- **3<sup>rd</sup> KS conference on 14 October 2021:** ACN invited experts from OGCI to provide introduction of OGCI's efforts on climate initiatives and the work on CO2 storage.
- **4<sup>th</sup> KS conference on 17 November 2021:** In collaboration with CEM (Clean Energy Ministerial) CCUS Initiative, ACN invited experts from CEM to provide introduction of CEM's activities.
- **5<sup>th</sup> KS conference 17 November 2021:** In collaboration with Department of Industry, Science, Energy, and Resource, Australia, ACN invited experts to share insight on CCUS policy, CCS projects and carbon recycling.

# Asia CCUS Network in 2021-22

## • Capacity Building Trainings

### Technical Workshop Day 1: Technical Aspect of Carbon **Capture** Technology

#### Speakers

- Mrs. Kikuko Shinchii, Senior Researcher of MRI
- Dr. David Kearns, Principal Consultant-CCS technology, **GCCSI**
- Mr. Takashi Kamijo, Chief Engineering Manager/ Project Director Decarbonization Business Dept **Mitsubishi Heavy Industries Engineering**

### Technical Workshop 3: **Utilization of CO2** (EOR/EGR and Carbon Recycling)

#### Speakers

- Mrs. Kikuko Shinchii, Senior Researcher of MRI
- Ms. Dewi Mersitarini, Advisor CCUS, **Pertamina RTC**, Indonesia
- Prof. Ning Yan, Dean's Chair Associate Professor, Head of Green Catalysis Lab, **National University of Singapore**

### Technical Workshop Day 2: Technical Aspect of Carbon **Transportation & Storage** Technology

#### Speakers

- Mrs. Kikuko Shinchii, Senior Researcher of MRI
- Mr. Ulysses Coulmas, Researcher, **MRI**
- Dr. Ziqiu Xue, Chief researcher, CO2 Storage Technology Group, Research Institute for Innovative Technologies for the Earth (**RITE**)

Date: 5-7 October 2021

Online Lecture by ERIA/MRI  
Q & A between the speakers  
and audiences

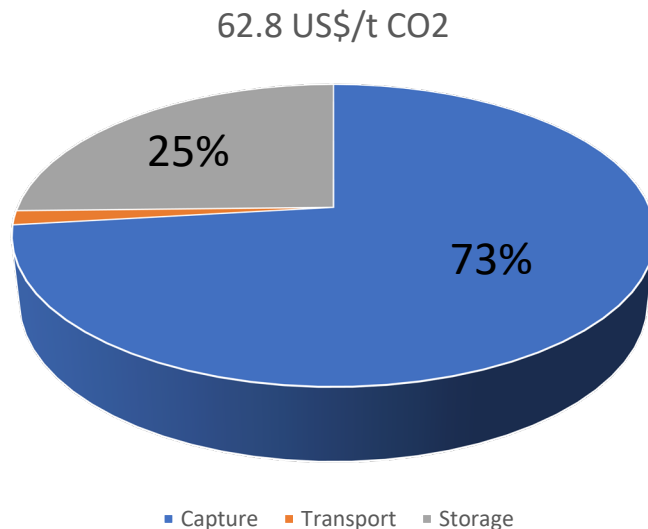
# Asia CCUS Network in 2021-22

## • Research Study with collaboration of MRI

### Model Case

- Capture: Chemical absorption (amine) to CO<sub>2</sub> from coal power plant (500 MW of USC)
- Transport: Pipeline (50 km)
- Storage: Sandstone formation (drilling about 800 m)
- Capital and Operation costs of the model case: refer to public information and data

### Results of the model case



### Regulatory and Policy Study

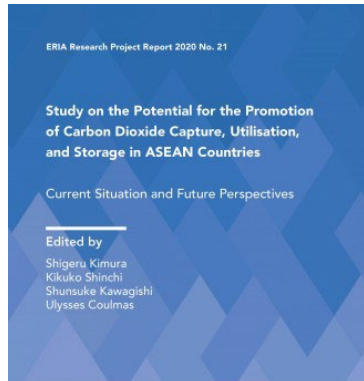
- a. Legal and Regulatory Framework
  - As a 1<sup>st</sup> step, develop a CCS-specific legal and regulatory framework by individual country
  - As a 2<sup>nd</sup> step, formulate ASEAN-wide cooperation framework on legal and regulatory framework
- b. Policy Framework
  - Carbon neutral, financial mechanism including carbon pricing, Innovative R&D, etc



# Asia CCUS Network in 2021-22

## CCUS Publications

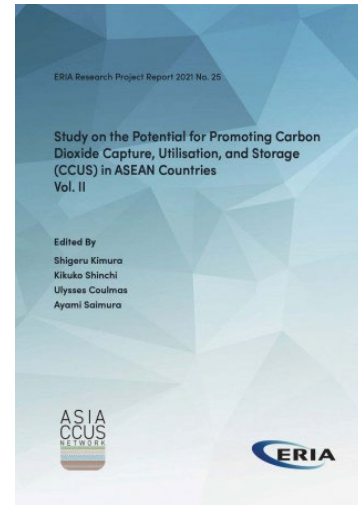
### Study on the Potential for the Promotion of Carbon Dioxide Capture, Utilisation, and Storage in ASEAN Countries: Vol. I and Vol. II



Vol. I. covers findings on recent trends in policies, technologies, and business development from countries with experience in Carbon Dioxide Capture, Utilisation, and Storage (CCUS). It also looks into the potential for CCUS development in the Association of Southeast Asian Nations (ASEAN) and the East Asia Region.

[Full report](#)

Edited by Shigeru Kimura, Kikuko Shinchi, Shunsuke Kawagishi, and Ulysses Coulmas



Edited by Shigeru Kimura, Kikuko Shinchi, Ulysses Coulmas, and Ayami Saimura

Vol. II was prepared under the Asia CCUS Network umbrella and focuses on the cost of Carbon Capture and Storage (CCS) and the legal framework of CCUS. To analyse the cost of CCS, we use a model case in central Java, Indonesia with the following assumptions: a) capture of CO<sub>2</sub> emitted from a 500MW coal power plant (ultra- supercritical) applying chemical absorption using amine, b) transport of CO<sub>2</sub> to the storage site through a 50km long pipeline, and c) storage of CO<sub>2</sub> in sandstone formation of about 1000m.

[Full report](#)



# The Second Asia CCUS Network Forum

- The second Asia CCUS forum was held in a hybrid system format at the Tokyo Prince hotel on September 30, 2022. After the opening remarks delivered by METI's minister and president of ERIA, 7 Ministers of EAS countries delivered congratulatory remarks, followed by three keynote speeches from GCCSI, JOGMEC and CCS + Initiative.
- ERIA reported the annual work activities in 2021-22 and introduced the work plan in 2022-23.
- The forum shared the view that CCUS technology is essential for Asia region, which is heavily dependent on thermal power generation, and that sharing a CCS pilot project there will act as a powerful symbol. The forum also confirmed that ACN member countries, companies, and other entities will pool their wisdom to help launch the CCS pilot project in this region by 2025 or after.

## 1. Event details

- Date : 30 September 2022
- Venue : Tokyo Prince Hotel (Hybrid System)
- Host : METI, ERIA

## 2. Programme

- Opening session (ERIA, METI)
- Ministerial session (7 Ministers of EAS Member Countries)
- Keynote speeches from GCCSI, JOGMEC and CCS + Initiative
- ACN annual report 2021-22 by ERIA
- Panel discussion (CCS policies in EAS countries – issues and challenges on CCS deployment)
- Closing remarks by METI and ERIA



## 3. Participants

- Speakers : 22
- In-person: 66
- Audience: over 400

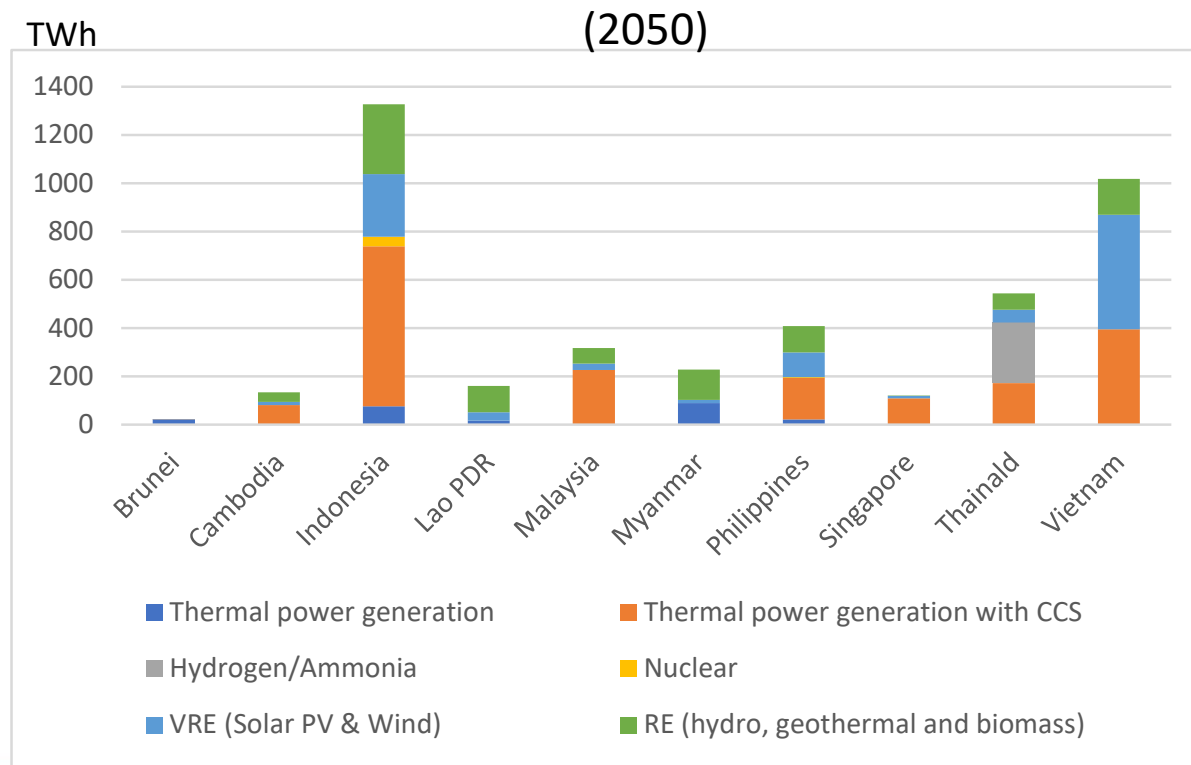


# Asia CCUS Network in 2022-23

- ERIA has been updating EAS Energy Outlook every two years;
  - Country coverage: EAS countries except Russia (ASEAN 10 + Australia, China, India, Japan, Korea, New Zealand and United States)
  - Methodology: Econometrics approach
  - Purpose: assessment of current EEC and RE policies being formulated by the EAS 17 in terms of energy saving and CO2 emission reduction
  - Update of EAS Energy Outlook in 2021-22 produces three scenarios; BAU, Alternative Policy Scenario (promotion of EEC and RE) and LCET-CN (Low Carbon Energy Transition-Carbon Neutral)
  - Concept of LCET-CN scenario
    - Final consumption sector: electrification and fuel switching from fossil fuel to hydrogen
    - Power sector: application of low carbon technologies
      - Increase VRE and traditional RE
      - Installation of nuclear power plant
      - Hydrogen/ammonia power generation
      - Thermal power plants with CCS

# Asia CCUS Network in 2022-23

- ASEAN power generation mix in 2050
  - 7 ASEAN countries will apply CCS for thermal power generation
  - Share of thermal power generation with CCS in ASEAN region will be 1,800 TWh and 42% of total power generation in 2050
  - Carbon neutral pathway looks shift from coal to gas, increase RE and apply CCS



# Asia CCUS Network in 2022-23

- Planned Research Studies in 2022-23 facilitating to launch a CCS pilot project;
  - **1<sup>st</sup> study on CO2 storage potential in Asia region**– Review of existing publications of CO2 storage potential in Asia region; Checking stratum maps of ASEAN and India; Rough estimation of CO2 storage potential in ASEAN and India based on the maps; and Rough estimation of CO2 storage potential of dry holes of oil and gas as well as EOR/EGR.
  - **2<sup>nd</sup> study on basic design of Asia CCUS value chain as a collective framework**– Application of hub and spoke concept for Asia CCUS value chain; Necessary regional legal and institutional framework to support the value chain; and Basic concept of Asia CCUS value chain center.
  - **3<sup>rd</sup> Study on legal and policy framework to deploy CCUS business**– Existing legal framework in ASEAN and India; Environment, safety operation of CCUS; Existing policy framework in ASEAN and India; Energy, environmental and economic policies; Financial incentive and carbon price market; and Proposed legal and policy framework in ASEAN and India.
  - **4<sup>th</sup> Study on financial framework to deploy CCUS business**– Necessary investment cost of CCUS; Shifting from public to private finance; Identify financial risks of private capital to invest CCUS business; Complimentary relation between public and private sector; and Impact by carbon price market.
  - **All these 4 studies will lead to the CCS pilot project by 2025.**

# Asia CCUS Network in 2022-23

- Knowledge sharing conference (online)
  - Carbon Engineering Ltd; “Perspective of DAC with CCS and Carbon Recycling” in January 2023
  - JOGMEC; “CCS Screening in Southeast Asia using Reginal Database” in 16 or 17 February 2023
  - Another 3-4 KS conferences will be organized
- Capacity building training (online)
  - Collaboration with USGS; “Capacity Building Training on CO2 Storage Potential in ASEAN Region”
    - Kick-off workshop: 23 June 2022 by online
    - Follow-up workshop: March – April 2023
    - Substantial trainings for ASEAN geologists may start after the follow-up workshop
  - Collaboration with the Questionnaire Survey for Global Storage Capacity Preliminary Research being conducted by USDOE, CEM CCUS Initiative, USGS and IEAGHG: Cambodia, Indonesia, Lao PDR and Myanmar responded the questionnaire

# Asia CCUS Network in 2022-23

- ACN Advisory Group
  - **Advisory group members:** ACN members which are ASEAN 10 countries + Australia , India, Japan and United States
  - **1<sup>st</sup> meeting on 10<sup>th</sup> June 2022:** Discussion on contents of 2<sup>nd</sup> ACN forum, bidding process of research studies regarding CCS, kick-off workshop USGS capacity building training on CO2 storage potential, the Global CO2 Storage Preliminary Survey, etc.
  - **2<sup>nd</sup> meeting on 28 September 2022:** Discussion on selection of the research study proposals submitted by ACN supporting members, ERIA-USGS joint training on CO2 storage potential in ASEAN region, rehearsal of 2<sup>nd</sup> ACN forum, etc.
  - **Site visit to JCCS Tomakomai CCS project on 28 September 2022**
- Contribution to external events
  - Participation to ACE-WCA Workshop on CCT and CCUS Financing towards Carbon Neutral on 31 March 2022
  - Co-hosting G20 ETWG side event namely “Making CCS/CCUS Affordable” on 13 April 2022
- Release the quarterly newsletters to ACN members and supporting members

# Asia CCUS Network in 2022-23

## Conclusions

- **CCS/CCUS** will be effective low carbon energy technology same as VRE to achieve carbon neutral in ASEAN region.
- Asia CCUS Network has launched to start a CCS pilot project in ASEAN region near future, thus following **research studies** are conducted;
  - CO2 storage potential
  - Legal and policy framework
  - Financial framework
  - CCS/CCUS value chain in Asia region
- **The results of each research study** will be opened publicly.
- In addition, Asia CCUS Network continues to organize **the knowledge sharing conference and capacity building training** for increasing correct understanding of CCS/CCUS development both technically and economically.
- **Asia CCUS Network (ACN)** will act as a platform regarding CCS/CCUS development and deployment in Asia region.



# Asia CCUS Network Website

- ERIA has been maintaining the ACN website which contain information about its members and missions, Asia CCS potential maps, and future activity plan, etc

<https://www.asiaccusnetwork-eria.org/>



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A large banner image showing an industrial facility with various towers, pipes, and structures under a clear sky. The text "Asia CCUS Network" is overlaid in the center.

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