ASEAN CCS UPDATES 2025

Vol. 1

December 2024 – February 2025

JOGMEC

ASEAN Centre for Energy
One Community for Sustainable Energy

Acknowledgements

This ASEAN CCS Updates 2025, Vol. 1 publication has benefitted from the overall guidance of ACE's Executive Director, Dato' Ir. Ts. Razib Dawood, and Power, Fossil Fuel, Alternative Energy and Storage (PFS) Department's Head, Beni Suryadi.

This publication was led by Aldilla Noor Rakhiemah, prepared by Lintang Ambar Pramesti and Bayu Jamalullael. ACE colleagues, Suwanto, Shania Esmeralda Manaloe and Muhammad Anis Zhafran Al Anwary provided helpful reviews and feedback.

Publication was supported by ACE Communications Team, Aurelia Syafina Luthfi and Amara Zahra Djamil. The design of this publication was supported by Fadhiel Handira Ishaq and Muhammad Bayu Pradana Effendy of ACCEPT II Team.

This edition is funded by **JOGMEC** and this collaboration is organised by **Mitsubishi Research Institute, Inc. (MRI)**. ACE and JOGMEC have a longstanding partnership. In April 2021, JOGMEC launched the "JOGMEC Carbon Neutral Initiative," focusing on clean resources, decarbonised fuels, and essential decarbonisation systems. In May 2024, they co-authored a research paper on CO_2 cross-border transportation opportunities and challenges in ASEAN, with the support of national experts and MRI.

Mitsubishi Research Institute

JOGMEC

Highlights – Indonesia

Japan, Indonesia adopt CCS/CCUS regulations, approve new methods at Joint Crediting Mechanism meeting [EN] [EN]

02/01/2025

Summary

Japan and Indonesia have introduced new guidelines for carbon capture, utilization, and storage (CCS/CCUS) projects under Japan's Joint Crediting Mechanism (JCM) during the 10th JCM Joint Committee meeting.

Indonesia launches CCS regulations to boost industry, achieve NZE target [EN] [ID]

08/01/2025

Summary

Indonesia's Ministry of Energy and Mineral Resources (MEMR) issued Regulation No. 16/2024, governing Carbon Capture and Storage (CCS), with 29 chapters and 75 articles.

Indonesia Business Post Holds Journalistic Training on Carbon Capture and Storage (CCS) [EN] [ID]

22/01/2025

Summary

Indonesia Business Posts conducted a journalistic training on "Understanding CCS" aiming to support public awareness and policy on CSS.

Forming an Acceleration Team, BPMA Ready to Support Regulations on the Implementation of Carbon Storage as the Main Focus [ID]

26/01/2025

Summary

Aceh's BPMA (Aceh Oil and Gas Management Agency) has formed a task force to accelerate CCS regulation development, aligning with the MEMR's agenda.

Highlights – Malaysia

RINA awarded contract for pre-FEED study by PETRONAS CCS Solutions to support major CCS project in Malaysia

[EN]

11/12/2024

Summary

Petronas CCS Solutions has commissioned RINA to conduct a pre-FEED study for designing CCS project infrastructure on the Northern hub in Kerteh and the Southern hub in Kuantan.

Singapore and Malaysia step up cooperation in areas like higher education, carbon credits, urban planning

[EN]

08/01/2025

Summary

Malaysia and Singapore signed six MOUs at the 11th Malaysia-Singapore Leaders' Retreat, including one on legally-binding cross-border CCS deal.

Petronas progressing Duyong offshore CCS project

[EN]

10/01/2025

Summary

Petronas, Adnoc, and Storegga are advancing a CCS project at Malaysia's Duyong Field, aiming for a 5 million tonnes per annum (Mtpa) capacity by 2030.

Japan deepens green energy, CCS cooperation in Southeast Asia

[EN]

13/01/2025

Summary

Japanese Prime Minister Shigeru Ishiba visited Malaysia and Indonesia to strengthen ties and discuss collaboration on carbon capture, green hydrogen, and renewable energy.

PTT outlines path to net zero at the 2025 Sustainability Forum [EN]

06/12/2024

Summary

PTT Plc outlined its net-zero strategy at the 2025 Sustainability Forum, targeting carbon neutrality by 2040 and net zero by 2050 with one of the key initiatives include CCS.

Liquid CO_2 carrier for CCS unveiled [EN]

17/01/2025

Summary

Japan's Kawasaki Kisen unveiled a 130-meter liquefied CO_2 transport vessel in Singapore to support Norway's Northern Lights CCS project.

News Details

Japan and Indonesia Strengthen Partnership with New CCS/CCUS Guidelines and Expanded JCM Framework

JCM
JOINT CREDITING MECHANISM
INDONESIA SECRETARIAT

KEMENTERIAN KOORDINATOR
BIDANG PEREKONOMIAN
REPUBLIK INDONESIA

Japan and Indonesia adopted **new guidelines for CCS/CCUS projects** under the **Joint Crediting Mechanism (JCM)** at the 10th JCM Joint Committee meeting held on 18 December 2024. The Joint Committee reviewed and approved draft revisions and new proposals to align the JCM with Article 6 of the Paris Agreement.

They updated the CCS guidelines to include CCUS as part of the JCM activities, which also covers Enhanced Oil Recovery (EOR) and Enhanced Gas Recovery (EGR). Specifically for CCS/CCUS, there **two specific guidelines** were contained in the meeting annexes: **Annex 11** and **Annex 12**.

Annex 11 – Joint Crediting Mechanism Guidelines for Developing Proposed Methodology for CCS

Reference emissions	Project may apply at least one of the methods listed by the guideline to calculate emission reduction.
Eligibility criteria	Requirements for project to be registered as JCM project and to be able to apply the approved methodology.
Eligible projects	CCS and CCUS activities which result in associated storage of CO_2.
Project lifecycle	Project planning/development, project operation, completion of CO_2 injection, and termination of the project.
Emission sources	Include emissions from fossil fuel combustion and electricity consumption associated with project activities and leakage from project facilities. Excluding emissions from fossil fuels produced by EOR and EGR.
Termination period monitoring	Following the criteria established in the JCM methodology in addition to laws and regulations of host country and region.
Reference documents	ISO27914 and ISO27916 are referred. In case of revision of ISO27914 and ISO27916, this guideline will also be reviewed.

Annex 12 – Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report for CCS

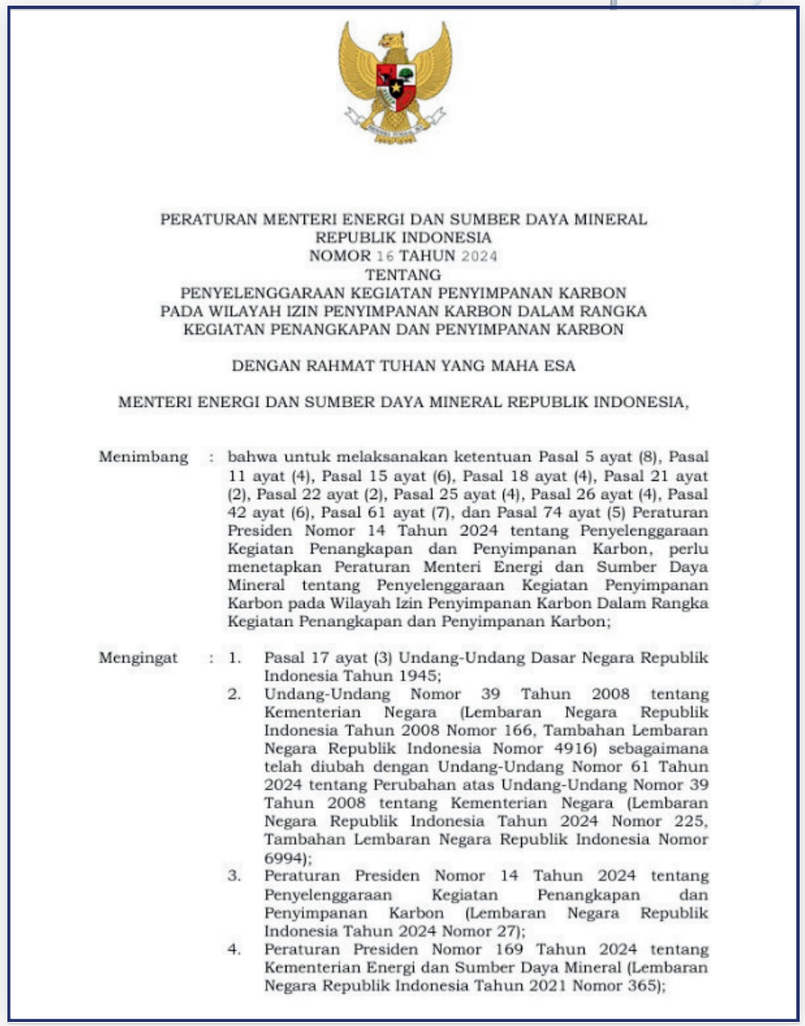
Completing a PDD form	Include project description, application of an approved methodologies, calculation of emission reduction, environmental impact assessment, local stakeholder consultation, arrangements for post-project termination monitoring, reference, and annexes.
Developing a Monitoring Plan	Include estimated values for each parameter with the descriptions and the responsible person for monitoring.
Preparing for actual measurement	Determine the frequency of calibration and describe the frequency in the Monitoring Plan Sheet.
Conducting monitoring	Conduct monitoring in line with the monitoring plan of the registered PDD.
Data correction for actual measurement	To calibrate measuring equipment as per the monitoring plan and determine the necessity for data correction in calculation of emission reductions following the decision tree.
Recording and achieving data	Project participants record and archive the data as per the monitoring plan and archive the evidence and records that validate the figures to be stated in the monitoring report.
Developing a monitoring report	Develop a monitoring report using the Monitoring Report Sheet applied to the registered JCM project and describe appropriate information.

Indonesia Strengthens Legal Framework for CCS with New Ministerial Regulation

On December 24, 2024, the new **Minister of Energy and Mineral Resources (MEMR) Regulation No. 16/2024 on the Implementation of Carbon Storage Activities** was issued. This regulation complements the existing legal framework for Carbon Capture and Storage (CCS), which includes **MEMR Regulation No. 2/2023** and **Presidential Regulation No. 14/2024.**

Ministerial Regulation No. 16/2024 enhances **Presidential Regulation No. 14/2024** by detailing the national legal framework for CCS implementation, including licensing and supervision mechanisms. Additionally, **MEMR Regulation No. 2/2023** focuses on the technical aspects of CCS, particularly carbon management in upstream oil and gas activities.

Area	Key Points
Objective	Provides a regulatory framework for CCS activities, including preparation, transportation, injection, and storage of CO_2, ensuring compliance with technical and environmental standards.
Permits	Two permits: 1. Exploration Permit: Valid for 6 years (extendable by 4 years). 2.Operational Permit: Valid for 30 years (extendable by 20 years). Both require feasibility studies, financial guarantees, and Monitoring, Reporting, and Verification (MRV) plans.
Carbon Transport Permit	Transporting captured carbon requires a separate permit. Systems must comply with safety guidelines and environmental protocols.
Monitoring and Reporting	• CCS operators must implement MRV frameworks for compliance and transparency. • Monitoring extends into the post-operation phase (10+ years). Reports must be submitted regularly.
Post-Operation	Operators are responsible for maintaining the site post-closure, including ongoing leakage checks and ecological safeguards for 10 years after operational activities end.
Government Oversight	MEMR oversees permit processes, ensures compliance, and enforces penalties such as permit revocation, fines, or legal action for non-compliance.



PERATURAN MENTERI ENERGI DAN SUMBER DAYA MINERAL
REPUBLIK INDONESIA
NOMOR 16 TAHUN 2024
TENTANG
PENYELENGGARAAN KEGIATAN PENYIMPANAN KARBON
PADA WILAYAH IZIN PENYIMPANAN KARBON DALAM RANGKA
KEGIATAN PENANGKAPAN DAN PENYIMPANAN KARBON

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI ENERGI DAN SUMBER DAYA MINERAL REPUBLIK INDONESIA,

Menimbang : bahwa untuk melaksanakan ketentuan Pasal 5 ayat (8), Pasal 11 ayat (4), Pasal 15 ayat (6), Pasal 18 ayat (4), Pasal 21 ayat (2), Pasal 22 ayat (2), Pasal 25 ayat (4), Pasal 26 ayat (4), Pasal 42 ayat (6), Pasal 61 ayat (7), dan Pasal 74 ayat (5) Peraturan Presiden Nomor 14 Tahun 2024 tentang Penyelenggaraan Kegiatan Penangkapan dan Penyimpanan Karbon, perlu menetapkan Peraturan Menteri Energi dan Sumber Daya Mineral tentang Penyelenggaraan Kegiatan Penyimpanan Karbon pada Wilayah Izin Penyimpanan Karbon Dalam Rangka Kegiatan Penangkapan dan Penyimpanan Karbon;

Mengingat :
1. Pasal 17 ayat (3) Undang-Undang Dasar Negara Republik Indonesia Tahun 1945;
2. Undang-Undang Nomor 39 Tahun 2008 tentang Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2008 Nomor 166, Tambahan Lembaran Negara Republik Indonesia Nomor 4916) sebagaimana telah diubah dengan Undang-Undang Nomor 61 Tahun 2024 tentang Perubahan atas Undang-Undang Nomor 39 Tahun 2008 tentang Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2024 Nomor 225, Tambahan Lembaran Negara Republik Indonesia Nomor 6994);
3. Peraturan Presiden Nomor 14 Tahun 2024 tentang Penyelenggaraan Kegiatan Penangkapan dan Penyimpanan Karbon (Lembaran Negara Republik Indonesia Tahun 2024 Nomor 27);
4. Peraturan Presiden Nomor 169 Tahun 2024 tentang Kementerian Energi dan Sumber Daya Mineral (Lembaran Negara Republik Indonesia Tahun 2021 Nomor 365);

Indonesia aims to enhance public understanding on CCS and accelerate CCS regulations formulation

Indonesia Business Post Holds Journalistic Training on CCS

Indonesia Business Post held a **journalism training** on CCS from January 18-19, 2025, in Bogor. The event aimed to **enhance journalists' understanding** of CCS technology, crucial for Indonesia's Net Zero Emissions goal by 2060. Key speakers included government officials and academics who discussed CCS basics, environmental impacts, implementation challenges, and regulatory frameworks.

The training emphasized the importance of **accurate and in-depth reporting on CCS** to support public awareness and policy. Indonesia has significant geological potential for CCS, which can attract green investments and support renewable energy development. **Effective communication and collaboration** between the government, private sector, and public are essential for accelerating sustainable energy transition.

At the event, Indonesia's state power utility, **PT PLN**, stated that they are exploring the use of CCS technology for **thermal-fired power plants (PLTU)** to maintain the reliability of the national electricity system. PLN believes with the right technological support CCS can help maintain energy sustainability and meet the Net Zero Emissions (NZE) target and emphasised the importance of policy and regulatory support to reduce the cost of implementing CCS.

BPMA Supports Accelerating the Formulation of CCS Regulations in Aceh Region

The Aceh Oil and Gas Management Agency (BPMA) has formed a **task force** to **accelerate the development of regulations** for CCS in Aceh. This initiative supports the government's agenda through the MEMR to optimise carbon storage potential. BPMA's head, Nasri Jalal, emphasised the importance of these regulations in attracting investment to Aceh.

The task force will collaborate with various stakeholders to prepare for CCS regulation implementation. BPMA recently participated in discussions at the MEMR regarding **MEMR Regulation No. 16 of 2024** on Carbon Storage Permit Areas. Additionally, **MEMR Regulation No. 9 of 2024** includes functions related to Carbon Storage Permit Areas within the Directorate General of Oil and Gas. BPMA is committed to supporting and collaborating with all parties within the MEMR.

Malaysia's CCS progress in technical and cross-border cooperation perspectives

RINA assessing requirements for Petronas CCS project in Malaysia

Petronas CCS Solutions Sdn Bhd (PCCSS) has hired RINA, a global company in inspection, certification, and engineering consultancy services, to perform a **pre-FEED study** for a CCS project in Malaysia, as announced in a December 11, 2025, press release. The project involves **developing two hubs**: the **Northern hub** in Kerteh and the **Southern hub** in Kuantan. RINA will handle the Northern hub's onshore terminal, jetty, and pipeline, and the Southern hub's onshore terminal, offshore pipeline, and platform.

These facilities aim to capture CO_2 emissions from local industries and store them in offshore geological formations. RINA plans to complete the study by the end of this year. The study includes creating detailed plans for the **necessary infrastructure** to manage CO_2, from capture at industrial sites to transportation via pipelines and storage in depleted offshore oil fields.

Petronas progressing Duyong offshore CCS project

In August 2024, Petronas, Adnoc, and Storegga signed a **Joint Study and Development Agreement (JSDA)** to evaluate CO_2 storage in saline aquifers. The JSDA aims for at least **5 Mtpa of CCS capacity by 2030**. Petronas will start seabed soil investigation work using the vessel Keyfields Helm, expected to last until the end of February.

Malaysia's deep saline aquifer reservoirs are key to developing large-scale CO_2 storage solutions. This initiative could establish a regional CCS hub, benefiting both domestic and international emitters. Adnoc targets a carbon capture capacity of **10 Mtpa by 2030**, equivalent to emissions from 2 million internal combustion vehicles.

Singapore and Malaysia step up cooperation in areas like higher education, carbon credits, urban planning

Singapore and Malaysia have recently signed several agreements to enhance bilateral cooperation, including a focus on **cross-border CCS**. The Johor-Singapore Special Economic Zone (JS-SEZ) aims to boost business and investment opportunities by improving connectivity and the business ecosystem.

A key aspect of their cooperation is the **legally binding agreement on CCS**, which includes sharing best practices, facilitating industry-led research, and establishing a joint committee. They also plan to develop carbon credit projects aligned with the Paris Agreement, promoting sustainable development.

Japan deepens green energy, CCS cooperation in Southeast Asia

Japanese Prime Minister Shigeru Ishiba and Malaysian Prime Minister Anwar Ibrahim **agreed to advance carbon capture** and green hydrogen projects, involving collaborations with Petros and Petronas. Under the **Asia Zero Emissions Community (AZEC)** framework, Japan is assisting Indonesia with CCS and other green energy initiatives. CCS is a crucial part of Japan's strategy to achieve decarbonization and energy security in the region. The technology is being integrated into various projects to capture and store carbon emissions, ensuring a sustainable energy transition.

Thailand's PTT outlines path to net zero at Sustainability Forum

PTT Public Company Limited (PTT Plc) has announced its strategy to achieve **net zero emissions by 2050**, 15 years ahead of Thailand's national target. The company aims for carbon neutrality by 2040 and has been listed on the Dow Jones Sustainability Indices since 2013. PTT's strategy includes focusing on low-carbon businesses, improving existing assets with modern technologies, and **investing in CCS**, hydrogen technology, and small modular reactors (SMR).

PTT Exploration and Production Plc (PTTEP), a subsidiary of PTT Plc, is leading the CCS pathway. The company has initiated **Thailand's first CCS project at the Arthit Gas Field**, expecting to reduce CO_2 emissions by approximately **0.7 – 1 Mtpa**. Under their EP Net Zero 2050 concept, CCS is included in the effort to achieve "Production and Planet in Balance."

The captured emissions will be injected and sequestered in reservoirs located in the **Gulf of Thailand and Malaysia**, marking the first of its kind in Thailand. Additionally, PTTEP is studying technology for **Carbon Capture and Utilization** to turn CO_2 into **value-added products or future materials.** The company is also advancing the Zero Routine Flare initiative for new projects by using technology to **recover and utilize flare gas along with CCS.**

Norwegian CO_2 carrier ship in Singapore offers glimpse of future carbon capture in the region

The **Northern Pathfinder**, a 130-meter-long vessel capable of holding **8,000 tonnes** of liquid CO_2, is part of the **Northern Lights project** and is has been **refuelled** in Singapore before continuing its journey to Norway, where an interim storage facility is waiting to receive the CO_2 before the liquid is sent to a vault kilometres beneath the **North Sea seabed.**

Northern Pathfinder offers a glimpse of the infrastructure needed to shape CCS projects in South-east Asia and the Asia-Pacific, where **shipping is crucial** due to the region's **archipelagic nature**. Shipping offers greater flexibility compared to pipelines, which are fixed between two points. As projects scale, more ships can be added to handle increased volumes, whereas pipelines have limited capacity once constructed.

Shell, as the lead developer of the vessel, is part of the S-Hub Consortium with ExxonMobil and the Singapore Government. The consortium is evaluating the feasibility of cross-border carbon capture projects and aims to develop a CCS project to store **2,500 kilotonnes** of CO_2 annually by 2030. Potential storage sites include **Brunei Darussalam, Malaysia,** China, and Australia.

About Northern Lights:

Northern Lights, the world's **first cross-border** CO_2 transport and storage facility, opened on September 26, 2024, in Øygarden, Bergen, Norway. It will store **37.5 $MtCO_2$** in the first phase.

This joint venture by Equinor, Shell, and TotalEnergies is part of Norway's **Longship CCS project.** It captures CO_2 from industrial sources, ships it to Øygarden, and transports it via pipeline to an offshore storage site below the North Sea seabed.

Check out
ASEAN CCS Updates 2024 Vol. 1

through the barcode & link below

go.aseanenergy.org/ASEAN-CCS-Updates-Vol1

Check out
ASEAN CCS Updates 2024 Vol. 2

through the barcode & link below

go.aseanenergy.org/ASEAN-CCS-Updates-Vol2

To learn more about the latest ACE publications you can download them from

aseanenergy.org/publications

For future information to provide feedback
Please contact ACE at
secretariat@aseanenergy.org