SUMMARY RECORD

THE 7TH GOVERNMENT-PRIVATE FORUM ON THE CLEANER ENERGY FUTURE INITIATIVE FOR ASEAN (CEFIA)

13 - 14 FEBRUARY 2025

KOBE CITY, JAPAN

INTRODUCTION

1. The 7th Government-Private Forum on the Cleaner Energy Future Initiative for ASEAN (CEFIA) was held in Kobe City, Japan, on 13 – 14 February 2025, in a hybrid setting.
2. The Forum was hosted by the Ministry of Economy, Trade and Industry (METI), Government of Japan, with support from the ASEAN Centre for Energy (ACE).
3. The Forum aimed to facilitate collaboration between the public and private sectors to accelerate the development of cleaner energy and decarbonisation technologies in the ASEAN region and highlighted hydrogen and ammonia technologies as a new CEFIA flagship project. The Forum agenda is attached as ***ANNEX 01***.
4. The Forum was attended by representatives from all 10 ASEAN Member States (AMS), private companies, academia, METI, and ACE, with an additional 135 participants joining via Zoom Webinar. The list of participants is attached as ***ANNEX 02***.

DAY 1

OPENING REMARKS

5. **Mr. Masaki Ogushi**, State Minister of Economy, Trade and Industry, Japan, delivered his opening remarks. He welcomed all participants to the 7th CEFIA Forum, held for the first time in Japan. He highlighted the forum as a platform for expert insights and announced the upcoming flagship project on hydrogen and ammonia, expanding its scope. He expressed his hope that AMS participants would gain insightful knowledge from this forum, which would assist in their respective countries' decarbonisation efforts.
6. **Dato' Ir. Ts. Razib Dawood**, Executive Director, ASEAN Centre for Energy delivered his opening remarks. He emphasised the forum's role in advancing decarbonisation technologies in ASEAN, aligning with regional APAEC targets for renewable energy and

energy efficiency. He also emphasised that CEFIA's contributions are vital for the development of the APAEC Post-2025, fostering collaboration with private sectors and financial institutions to further regional energy cooperation

SETTING SCENE PRESENTATION

7. **Mr. Naoki Kasuya**, Senior Director for Energy and Environmental Policy, METI, presented the *"*Progress of AZEC's Initiatives*"*. The presentation material is available in ***ANNEX 03***. The Forum noted the following items:
    i. The Asia Zero Emission Community (AZEC), proposed by Japan in 2022, aims to foster a shared philosophy of decarbonisation among Asian countries and promote energy transitions through diverse, country-specific pathways.
    ii. At the 2nd AZEC Summit in October 2024, partner countries agreed on a joint "Action Plan for the Next Decade" to operationalise AZEC solutions, reaffirm AZEC principles of inclusive economic growth, energy security, and climate action, and promote tangible decarbonisation projects.
    iii. The AZEC framework is structured around three pillars: facilitating decarbonisation-supportive rules and finance mechanisms, promoting sectoral initiatives via the Asia Zero Emission Center, and supporting concrete projects through official development assistance (ODA) and other government-backed measures.
8. **Mr. Tung Phuong**, Senior Officer, ASEAN Plan of Action for Energy Cooperation (APAEC) Department, ACE, presented the *"*Review of the 6th CEFIA Forum, Directions from the 21st AMEM+3, Updates on APAEC Phase II: 2021–2025 and APAEC Post 2025*"*. The presentation material is available in ***ANNEX 04***. The Forum noted the following items:
    i. The ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II (2021–2025) has made notable progress across seven key programme areas, including Renewable Energy (RE) and Energy Efficiency And Conservation (EEC), with the overall implementation score reaching 4.1 out of 5 by December 2024.
    ii. The 21st AMEM+3 Meeting recognised the growing role of CEFIA in promoting private sector participation and transition financing, and emphasised the alignment of flagship decarbonisation projects with the forthcoming APAEC Post-2025 agenda.
    iii. Development of APAEC Post-2025 (2026–2030) is underway, guided by the endorsed five-year theme "Advancing Regional Cooperation in Ensuring Energy Security and Accelerating Decarbonisation for a Just and Inclusive

Energy Transition," aiming to support a low-carbon, interconnected ASEAN energy future.

SESSION I: OVERVIEW OF FLAGSHIP PROJECTS (FP)

9. **Ms. Peoy Ying Lee**, Japan Electronics and Information Technology Industries Association (JEITA), presented the *"*Activities of RENKEI Control: Unique and Integrated Concept on Energy Management System for ASEAN Business Establishments*"*. The presentation material is available in ***ANNEX 05***. The Forum noted the following items:
    i. RENKEI Control is an optimisation strategy for industrial and utility plants that aims to enhance energy efficiency through coordinated control of multiple energy systems, including HVAC, boilers, and cogeneration plants, with potential applications in smart cities.
    ii. From FY2020 to FY2023, the project conducted feasibility studies in Thailand, Indonesia, Vietnam, and Malaysia, delivered industry webinars, held in-person seminars, and developed training programmes in partnership with universities and government stakeholders.
    iii. The FY2024 programme includes a hybrid seminar and ongoing development of capacity-building tools like the RENKEI Control Assessment Tool and e-learning modules for energy managers across ASEAN Member States.
10. **Mr. Katsuhiko Yamamoto**, Japanese Business Alliance for Smart Energy Worldwide (JASE-W) / International Cooperation Division Technical Expert, The Energy Conservation Center, Japan, presented the *"*Activities of Net-Zero Energy Building*"*. The presentation material is available in ***ANNEX 06***. The Forum noted the following items:
    i. The ZEB (Net Zero Energy Building) concept aims to balance building energy consumption and production through advanced energy-saving and renewable technologies, adapted for ASEAN through a step-by-step "ZEB family" framework.
    ii. MoUs and workshops were held with stakeholders in Malaysia, Vietnam, Indonesia, Thailand, and the Philippines. A retrofit ZEB demonstration project is underway in Malaysia in collaboration with SEDA.
    iii. Continued regional engagement, including updated ISO standards, further workshops, and scaling up demonstration projects to promote regional policy support and adoption of ZEB technologies.
11. **Dr. Fumitaka Kato**, The Committee member for International Environmental Strategic Committee, Japan Iron and Steel Federation, presented the *"*Energy Efficient Technologies in ASEAN Iron and Steel Industry (SteelEcosol)*"*. The presentation material is available in ***ANNEX 07***. The Forum noted the following items:

i. SteelEcosol promotes the adoption of Best Available Technologies (BAT) in ASEAN's steel industry to enhance energy efficiency and reduce CO_2 emissions as a practical pathway before the large-scale deployment of low-carbon steelmaking technologies.

ii. Since 2014, ASEAN-Japan collaboration under AJSI has enabled energy audits, knowledge exchange, and seminars. In FY2024, SteelEcosol conducted plant diagnoses and developed guidelines toward net-zero steelmaking.

iii. Through collaboration with ERIA, SteelEcosol will implement a three-phase plan (2024–2027), including plant assessments, publishing guidelines, and formulating a decarbonisation outlook for ASEAN's steel sector.

12. **Mr. Shingo Numa**, CEO, Forest Energy Inc., presented the *"*CO_2 Neutral Energy + Carbon Sink using Local Biomass*"*. The presentation material is available in ***ANNEX 08***. The Forum noted the following items:

    i. Forest Energy promotes local biomass-based CHP systems that generate CO_2-neutral energy and produce biochar, a by-product that enables carbon sequestration recognised by the IPCC.

    ii. Implemented projects in Japan with CHP systems, and developed biochar + compost pellets that demonstrated improved agricultural yield in 2023–2024 field trials.

    iii. A feasibility study in a CEFIA member country is proposed for 2025/2026 to co-develop a localised "Biochar x Energy" model, inviting ASEAN universities or research institutes to collaborate.

13. **Mr. Hiroyuki Tanaka**, Daikin Industries, Ltd., presented the *"*Carbon Neutrality solution: Healthy and Energy Efficient AC system for ASEAN market*"*. The presentation material is available in ***ANNEX 09***. The Forum noted the following items:

    i. Daikin's AC-ECP system integrates energy recovery ventilation to address excessive cooling culture in ASEAN, offering an efficient and comfortable air-conditioning solution aligned with carbon neutrality goals.

    ii. Field verification was conducted in Thailand and Vietnam, showing energy savings of 30–45% and improved comfort standards. Collaborations with universities supported evidence-based results.

    iii. Further testing during Vietnam's hot season (April 2025) will validate system performance under peak load conditions. Promoting improvements in building airtightness is also part of the CN strategy.

14. **Ms. Aoi Suzuki**, Furukawa Battery, presented the *"*Microgrid*"*. The presentation material is available in ***ANNEX 10***. The Forum noted the following items:

i. Microgrids offer decentralised power generation and resilience for remote or disaster-prone areas, using a combination of renewable sources and long-life lead-acid battery systems for stable 24-hour energy supply.

ii. Demonstrated in multiple ASEAN locations such as Indonesia, the Philippines, and Thailand. Key projects include integration with Kyudenko's EMS and supply of batteries for weather stations and off-grid areas.

iii. Under the CEFIA flagship framework, continued expansion and policy engagement will be pursued to support ASEAN's energy security and decarbonisation through knowledge-sharing and replicable microgrid models.

SESSION II: CEFIA'S CROSS-CUTTING FIELD IN PUBLIC AND PRIVATE FINANCE

15. **Mr. Teppei Yamaga**, Managing Director, Sustainability Planning Department, Mizuho FG, presented the *"*GHG Avoided Emissions Visualization*"*. The presentation material is available in ***ANNEX 11***. The Forum noted the following items:

    i. Mizuho introduced the concept of "Avoided Emissions" (AE) as a complementary metric to conventional GHG emissions, aimed at quantifying the positive climate impact of new products and services that reduce societal emissions.

    ii. Mizuho has developed a comprehensive AE value chain, conducted AE disclosure in its power generation finance portfolio, and integrated AE as sustainability performance targets (SPTs) in various sustainable finance instruments including loans and bonds.

    iii. Mizuho will continue promoting AE metrics as tools for evaluating climate-related opportunities and mobilising private finance, aiming to enhance financial flows toward clean technologies and decarbonisation projects across the ASEAN region.

16. **Ms. Maria Teresita Lacerna**, Legal Adviser and Lead, Sustainable Finance & Green Development, ADFIAP, presented the *"*Accelerating Project Formulation through Financing Flagship Project*"*. The presentation material is available in ***ANNEX 12***. The Forum noted the following items:

    i. In collaboration with CEFIA, ADFIAP aims to strengthen access to transition finance for green building development and low-carbon technologies, thereby supporting ASEAN's sustainable infrastructure goals.

    ii. Pilot programmes were implemented with DBP (Development Bank of the Philippines) involving diagnostics, programme development, and capacity building. BPMB (Malaysia) underwent readiness assessment and diagnostics, while roadshows and engagement activities were also carried out.

iii. The project will continue with client engagement, transaction facilitation, and policy advocacy. It aims to scale the green building financing programme and replicate best practices across more financial institutions in the ASEAN region.

17. **Dr. Zulfikar Yurnaidi**, Head of Energy Modelling and Policy Planning (MPP) and Energy Efficiency and Conservation (CEE) Department, ACE, presented the *"*ASEAN Accelerator: Global Cleantech Innovation Programme (GCIP) for ASEAN*"*. The presentation material is available in ***ANNEX 13***. The Forum noted the following items:
    i. The ASEAN Accelerator is a regional initiative under the JAIF-funded project to enhance the clean energy technology ecosystem by supporting cleantech MSMEs, fostering innovation, and enabling investment connectivity across the region.
    ii. The programme has established its project management unit, steering committee, and developed a web-based platform. It also initiated studies on cleantech startups, MSMEs, and existing policies that support innovation and entrepreneurship.
    iii. Upcoming activities include launching the ASEAN Accelerator Programme, delivering capacity-building workshops, selecting cleantech experts and startups, and conducting regional matchmaking and policy dialogues to boost cleantech deployment and cross-border collaboration.

SESSION III: CEFIA's NEW FLAGSHIP PROJECTS - HYDROGEN & AMMONIA

18. **Mr. Yotaro Miyagawa**, METI, presented the *"*Japan's Hydrogen & Ammonia Policies*"*. The presentation material is available in ***ANNEX 14***. The Forum noted the following items:
    i. Japan's hydrogen and ammonia strategy is a key component of its Green Transformation (GX) policies aimed at simultaneously achieving emissions reduction, energy security, and economic growth. The government has enacted the Hydrogen Society Promotion Act and committed substantial funding to develop a resilient low-carbon energy supply chain.
    ii. Japan is leveraging its technological leadership in hydrogen production (electrolysis, CCUS), transportation (liquefied hydrogen carriers), and utilisation (fuel cells, power generation, and industrial applications). Ammonia combustion technologies are being developed for coal and gas turbines, with plans for commercial-scale deployment.
    iii. Japan is actively promoting bilateral and multilateral cooperation, including demonstration projects and the Hydrogen Energy Ministerial Meeting. Future initiatives include the deployment of ammonia gas turbines in ASEAN countries such as Malaysia, with further collaboration planned under Expo 2025 Osaka.

19. **Mr. Masaru Kawata**, General Manager, Japan Hydrogen Association (JH2A), presented the *"*Hydrogen*"*. The presentation material is available in ***ANNEX 15***. The Forum noted the following items:
    i. The Japan Hydrogen Association (JH2A), established in 2022, aims to foster a hydrogen society by addressing regulatory challenges, stimulating demand, and facilitating business and policy coordination. It comprises over 470 member organisations.
    ii. JH2A supports innovations across the hydrogen value chain, including marine transportation via methylcyclohexane (MCH), decentralised production using biogas, and hydrogen distribution through pipelines and hydrogen stations. Projects range from mobility to industrial use cases.
    iii. JH2A is expanding international cooperation with hydrogen associations across ASEAN, including Indonesia, Vietnam, and Thailand. It promotes joint studies, business matching, and investment via the Japan Hydrogen Fund, which focuses on hydrogen-related infrastructure in Asia.
20. **Mr. Shunichiro Ueno**, Deputy Secretary-General, Clean Fuel Ammonia Association (CFAA), presented the *"*Ammonia*"*. The presentation material is available in ***ANNEX 16***. The Forum noted the following items:
    i. The Clean Fuel Ammonia Association (CFAA) was established to implement a clean fuel ammonia value chain, promote policy coordination, and support R&D for ammonia as a hydrogen carrier. It has 249 members from 18 countries.
    ii. Ammonia is highlighted for its high hydrogen content and carbon-free combustion. CFAA members are developing and demonstrating key technologies such as ammonia co-firing in coal power plants, ammonia-fuelled gas turbines, marine engines, and industrial furnaces, with projects progressing towards commercial viability.
    iii. Multiple feasibility and demonstration projects are underway across ASEAN, including Indonesia, Malaysia, Thailand, the Philippines, and Singapore. These initiatives involve co-firing trials, ammonia supply chain studies, and joint development agreements for green ammonia production and ammonia cracking for hydrogen extraction.

SESSION IV: JAPANESE ADVANCED TECHNOLOGIES

21. **Mr. Koji Ito**, Mitsubishi Heavy Industries, presented the *"*CCUS*"*. The presentation material is available in ***ANNEX 17***. The Forum noted the following items:
    i. Mitsubishi Heavy Industries (MHI) is positioning CCUS as a long-term strategic pillar in its carbon neutrality roadmap. The group has committed to net zero

emissions by 2040, both across its operations and value chain, ahead of Japan's national 2050 target.

ii. MHI possesses proprietary post-combustion CO_2 capture technology, backed by over 30 years of R&D and the world's leading commercial delivery record. It offers an integrated CCUS value chain, including capture, compression, transport, utilisation, and storage. A joint alliance with ExxonMobil enhances its end-to-end CCUS solutions.

iii. MHI plans to install a new CO_2 capture pilot plant at KEPCO's Himeji No.2 Power Station in 2025. This initiative will support R&D on next-generation technologies and foster collaboration with ASEAN countries to establish regional CCUS supply chains and carbon-neutral infrastructure.

22. **Mr. Takeru Bessho**, SEKISUI CHEMICAL CO., LTD., presented the *"*Next Generation Solar Cell Development: Perovskite-type Solar Cell*"*. The presentation material is available in ***ANNEX 18***. The Forum noted the following items:

    i. Sekisui Chemical is advancing perovskite solar cell (PSC) technology as part of Japan's national Green Innovation initiative. PSCs offer a promising lightweight and flexible solution to expand solar deployment in space-constrained urban areas and buildings with low load-bearing capacity.

    ii. Film-type perovskite solar cells achieve comparable power efficiency (15%) to traditional silicon cells while being thinner, lighter, and easier to install. Sekisui has demonstrated 10-year durability and aims to reach 20% efficiency with a 1-metre-wide roll-to-roll production line by FY2027.

    iii. Sekisui is actively deploying demonstration projects in Japan and plans to scale globally. It is preparing market entry in FY2025 and exploring ASEAN partnerships to install PSCs in public infrastructure such as rooftops, railway stations, and sewerage covers, leveraging their lightweight nature and localised value chains.

23. **Mr. Shinichi Tsunoda**, Operating Officer & General Manager, Sustainable Business Promotion Department, Mizuho Financial Group, Inc., presented the *"*Finance*"*. The presentation material is available in ***ANNEX 19***. The Forum noted the following items:

    i. Mizuho Financial Group is leading transition finance in Asia, helping bridge the gap between current carbon-intensive systems and long-term decarbonisation goals. With strong expertise in structuring finance, it supports both private and public sector transitions through innovative instruments and partnerships.

    ii. Mizuho supports technology deployment in hard-to-abate sectors (e.g. steel, cement, power) via science-based transition strategies, aligned with sector-

specific roadmaps. It utilises tools such as blended finance, risk mitigation instruments, and carbon pricing to increase project bankability and feasibility.

iii. Through initiatives such as the Asia Transition Finance Study Group (ATF SG), Mizuho collaborates with ASEAN stakeholders to implement regionally adapted taxonomies, financing structures, and capacity-building. It aims to strengthen transition pathways through ASEAN-wide partnerships, policy alignment, and investment facilitation.

SESSION V: ASEAN'S PATH TO DECARBONISATION: COUNTRY PRIORITIES, REGIONAL COLLABORATION, AND CEFIA'S ROLE

24. **Ms. Mardika Firlina**, Associate Officer of Energy Efficiency and Conservation Department, ACE, presented the *"*ASEAN Decarbonisation Targets, Progress, and Initiatives Focusing on Renewable Energy and Energy Efficiency under the APAEC Framework*"*. The presentation material is available in ***ANNEX 20***. The Forum noted the following items:

    i. ASEAN has undertaken numerous regional initiatives to support decarbonisation under the APAEC framework, including the development of Monitoring and Verification Guidelines for air conditioners, capacity-building on Zero Energy Buildings (ZEB), the publication of net-zero roadmaps for the steel industry, and studies on bioenergy, hydrogen, and ammonia. These initiatives align with ASEAN's carbon neutrality targets, where most Member States aim for net-zero emissions by 2050.

    ii. Several CEFIA flagship projects—such as RENKEI Control, SteelEcosol, Microgrids, and ASEAN Accelerator—are supporting APAEC targets in the areas of energy efficiency and renewable energy. Continued alignment is planned through regional collaboration, technical studies, policy consultations, and knowledge-sharing platforms such as ASEAN Energy Awards and the ASEAN Energy Database System.

    iii. It is recommended that CEFIA expand its flagship projects to more comprehensively address the needs of all ASEAN Member States, upscale activities from national to regional implementation, increase the provision of capacity-building activities (both online and offline), and deliver tailored technical assistance through regionally relevant case studies and policy-oriented reports.

25. Representatives from AMS, presented the *"*Country Priorities and Perspectives for Achieving Decarbonisation Goals and Potential Support by CEFIA*"*. The Forum noted the following items:

i. Brunei aims for net-zero emissions by 2050, with key priorities including renewable energy expansion and improved power management. It proposes regional cooperation on smart grids, energy management systems, and green building technologies. Suggested next flagship topics include just transition governance and data analytics for energy efficiency strategy development. The presentation material is available in ***ANNEX 21***

ii. Cambodia targets 70% renewable capacity, a 19% reduction in energy consumption, and broader electrification by 2030. It proposes enhanced collaboration on both demand- and supply-side decarbonisation across ASEAN. For CEFIA, Cambodia suggests initiatives that support national policy implementation for carbon neutrality by 2050. The presentation material is available in ***ANNEX 22***

iii. Indonesia's Enhanced NDC (e-NDC) commits to reducing emissions in the energy sector through renewables, electrification, and energy efficiency. Regional collaboration is proposed in areas such as clean energy investments, EE&C implementation, and financial innovation. A prospective flagship topic includes the development of sustainable financing models for energy efficiency and conservation. The presentation material is available in ***ANNEX 23***

iv. Lao PDR seeks to increase the renewable energy share to 30% by 2025 and cut fuel imports through biofuel substitution. It supports regional cooperation on renewable integration, energy efficiency, and R&D under CEFIA. A proposed flagship topic is multi-source power production with enhanced grid integration. The presentation material is available in ***ANNEX 24***

v. Malaysia targets net-zero GHG emissions by 2050 and a renewable energy mix of 70% by the same year. It encourages regional collaboration through standard harmonisation, training academies, and joint financing mechanisms. The proposed flagship focus is an integrated support programme combining financial incentives and capacity-building to overcome regional policy and infrastructure gaps. The presentation material is available in ***ANNEX 25***

vi. Myanmar’s decarbonisation strategy includes implementing energy efficiency codes and promoting green buildings. Regional cooperation initiatives include solar power deployment, hydropower rehabilitation, and building energy design standards. A suggested flagship topic is energy security and resilience through cross-border clean energy trade. The presentation material is available in ***ANNEX 26***

vii. The Philippines targets net-zero emissions by 2050, with intermediate RE share goals of 35% by 2030 and 50% by 2040. It proposes regional

collaboration in RE integration, off-grid solutions, and policy alignment for clean energy adoption. A potential flagship project includes scaling energy storage and RE systems in remote ASEAN communities. The presentation material is available in ***ANNEX 27***

viii. Singapore focuses on industrial energy efficiency as its primary decarbonisation strategy, backed by regulations, financial incentives, and capability-building programmes. It supports knowledge exchange and capacity development as regional priorities. A proposed flagship topic could involve cross-border collaboration on industrial EE technologies and standards. The presentation material is available in ***ANNEX 28***

ix. Thailand's targets include carbon neutrality by 2050 and net-zero by 2065, with a strategy focused on RE expansion, smart grid modernisation, and investment in clean technologies. It encourages regional collaboration on hydrogen integration, battery storage, and clean transport. A proposed flagship initiative is a regional clean hydrogen economy roadmap. The presentation material is available in ***ANNEX 29***

x. Vietnam's decarbonisation plan centres on green buildings, alternative fuels, and energy-saving technologies, as per its Energy Outlook 2024. It supports regional cooperation in RE deployment and energy-efficient infrastructure development. A proposed flagship topic includes green building code development and alternative fuel integration across ASEAN. The presentation material is available in ***ANNEX 30***

CLOSING REMARKS

26. **Mr. Norihiro Kimura**, Senior Negotiator for Climate Change, Global Environmental Affairs Office, METI, delivered his closing remarks. He expressed gratitude to the AMS participants for their attendance at the CEFIA Forum in Japan and acknowledged their valuable country insights, priorities, and action plans for achieving decarbonisation goals, as well as the potential support from CEFIA. He also committed to the continuation of CEFIA activities and forums to support ASEAN's decarbonisation efforts.
27. **Dr. Zulfikar Yurnaidi**, Head of MPP and CEE Department, ACE, delivered his closing remarks. He expressed gratitude to METI and AMS for their participation and acknowledged the forum's productive discussions on CEFIA's achievements and decarbonisation priorities. He emphasised the importance of the feedback received and reiterated the commitment to strengthening collaboration with Japan and the private sector to advance ASEAN's sustainable energy goals.

ACKNOWLEDGEMENT

28. The Forum expressed its sincere thanks and appreciation to ACE and METI for their technical and secretariat assistance, and for the excellent arrangements made for the 7th CEFIA Forum and its excursions

********End of Summary Record********