SUMMARY OF WORKSHOP

34th Energy Conservation Workshop (ECAP)
ASEAN - Japan Energy Efficiency Partnership (AJEEP)

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Presented by:
Rio Jon Piter Silitonga
Senior Research Analyst
Energy Efficiency and Conservation (CEE) Department
ASEAN Centre for Energy (ACE)

Outline

1. Analysis of Current Key Energy Efficiency Policies and Programs in 10 AMS Towards Carbon Neutrality

2. Gap Analysis and Potential Future Support from ASEAN-Japan EE Cooperation

3. Lessons Learned from Japan's Policy and Best Practices on Carbon Neutrality

4. Way Forward

Summary: Key EE&C Policy and Measures Towards CN in 10 AMS

Country	Climate Change Initiatives	Carbon-Neutral Measures	Energy Conservation Initiatives
Brunei Darussalam	BNCCP, increase forest cover, electric vehicles, renewable energy targets	No carbon tax, exploring carbon pricing, bioenergy, solar PV deployment	Energy policies, energy efficiency standards, financial incentives, energy audits
Cambodia	Clean Energy Transition Roadmap, 100% renewable energy by 2025	No carbon tax, exploring hydrogen and CCUS, solar and biomass energy	Energy efficiency policies, energy audits, financial incentives, energy management systems
Indonesia	National Energy Policy, renewable energy targets, geothermal power	Carbon tax on coal-fired power plants, carbon trading, hydrogen strategy, CCUS	Energy management, energy efficiency standards, financial incentives, energy audits
Lao PDR	Renewable energy targets, hydropower, bioenergy	No carbon tax, exploring hydrogen and ammonia, solar and wind energy	Energy efficiency policies, energy audits, financial incentives, energy management systems

Summary: Key EE&C Policy and Measures Towards CN in 10 AMS

Country	Climate Change Initiatives	Carbon-Neutral Measures	Energy Conservation Initiatives
Malaysia	National Energy Policy, NETR, renewable energy targets, solar PV	Exploring carbon tax, hydrogen strategy, CCUS, bioenergy	Energy efficiency policies, energy audits, financial incentives, energy management systems
Myanmar	Renewable energy targets, hydropower, bioenergy	No carbon tax, exploring CCUS, solar and wind energy	Energy efficiency policies, energy audits, financial incentives, energy management systems
Philippines	National Energy Efficiency and Conservation Plan, renewable energy targets	Exploring carbon pricing, hydrogen strategy, CCUS, biofuel	Energy efficiency policies, energy audits, financial incentives, energy management systems
Singapore	Green Plan 2030, solar deployment, regional power grids	Carbon tax, hydrogen strategy, CCUS, solar and energy storage systems	Energy efficiency policies, energy audits, financial incentives, energy management systems
Thailand	National Energy Plan, renewable energy targets, bio-circular-green economy	Exploring carbon tax policy development advanced CCUS technologies	Energy efficiency policies and standards are widely implemented.
Vietnam	National Green Growth Strategy renewable energy targets solar and wind energy	Exploring carbon pricing mechanisms advanced hydrogen and CCUS technologies	Energy efficiency policies and standards are widely implemented.

Summary of Compelling EE&C Measures in AMS

Regulatory Elements & Measures	Cambodia	Indonesia	Lao PDR	Malaysia	Philippines	Singapore	Thailand	Vietnam
Energy Efficiency Law/Act	M (2023)	M (2023)	D	M (2023)	M (RA 11285)	M	M	M
Building Regulations								
Building Energy Code	D	M	D	M	M	M	M	M
Green Building Standards	-	V	D	V	V	M (80% by 2030)	V	V
Energy Management Requirements	D	M	D	M	M	M	M	M
Equipment & Appliances								
MEPS Program	M	M	M	M	M	M	M	M
Energy Labeling	M	M	V	M	M (PELP)	M	M	M
Certification System	D	M	D	M	M	M	M	M
Support Mechanisms								
Financial Incentives	D	V	V	V	V	V	V	V
Tax Benefits	-	V	-	V	V	V	V	V
ESCO Support	-	V	-	V	V	V	V	V
Energy Management								
Energy Manager System	M	M	D	M	M	M	M	M
Energy Audit Requirements	D	M	D	M	M	M	M	M
Periodic Reporting	M	M	D	M	M	M	M	M
Target Setting								
National EE Targets	M (19% by 2030)	M	M (10% by 2030)	M	M (10% by 2040)	M	M	M
Building Sector Targets	M (25% by 2030)	M	D	M	M	M	M	M
Industry Sector Targets	M (20% by 2030)	M	D	M	M	M	M	M

Limitation: Data based on AMS country report during the ECAP 34 Workshop

Sources: Country Report

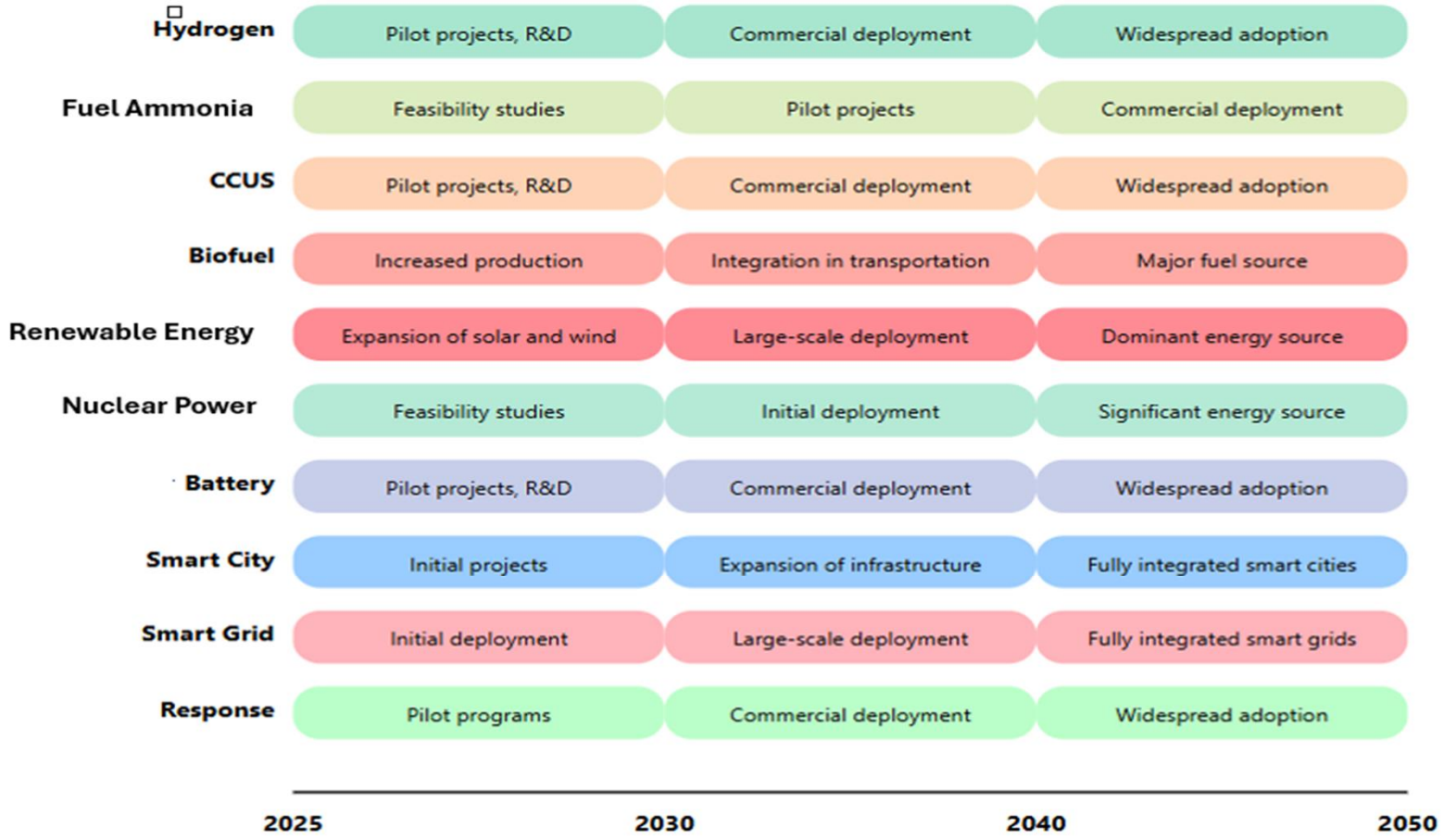
Gap Analysis and Technical Assistance Needed

Country	Observed Gaps	Technical Assistance Needed
Brunei Darussalam	Limited carbon pricing mechanisms need for advanced renewable energy technologies	Support in developing carbon pricing models advanced solar and bioenergy technologies
Cambodia	Lack of carbon tax need for hydrogen and CCUS technologies limited financial incentives	Assistance in carbon tax implementation hydrogen and CCUS technology transfer financial incentives
Indonesia	Need for broader carbon trading mechanisms advanced hydrogen and CCUS technologies	Expansion of carbon trading systems advanced hydrogen and CCUS technology transfer
Lao PDR	Limited renewable energy deployment need for hydrogen and ammonia technologies	Support in renewable energy projects hydrogen and ammonia technology transfer

Gap Analysis and Technical Assistance Needed

Country	Observed Gaps	Technical Assistance Needed
Malaysia	Need for comprehensive carbon tax policy advanced hydrogen and CCUS technologies	Assistance in carbon tax policy development advanced hydrogen and CCUS technology transfer
Myanmar	Limited renewable energy projects need for CCUS technologies	Support in renewable energy projects CCUS technology transfer
Philippines	Need for carbon pricing mechanisms advanced hydrogen and CCUS technologies	Assistance in carbon pricing implementation advanced hydrogen and CCUS technology transfer
Singapore	Need for scaling up renewable energy and energy storage systems	Support in large-scale renewable energy projects advanced energy storage systems
Thailand	Need for comprehensive carbon tax policy advanced CCUS technologies	Assistance in carbon tax policy development advanced CCUS technology transfer
Vietnam	Need for carbon pricing mechanisms advanced hydrogen and CCUS technologies	Assistance in carbon pricing implementation advanced hydrogen and CCUS technology transfer

Technology Pathways towards ASEAN Carbon Neutrality



Source: Country Report

Key Lesson Learned on Japan's Policy on Green Hydrogen

1. Policy Framework:

- Clear national strategy and legal framework are essential (Japan was first to create national hydrogen strategy in 2017)
- Long-term government support (15+ years) is needed for commercial viability
- Multiple parallel approaches needed (hydrogen, ammonia, synthetic fuels)
- Balance between emissions reduction, economic growth, and energy security

2. Supply Chain Development:

- Need integrated approach covering production, storage, transport, and utilization
- Multiple transport methods required (liquid hydrogen, ammonia, LOHC)
- Infrastructure development crucial for commercialization
- Hub development important for efficient distribution

3. Technology Portfolio:

- Different types of hydrogen (gray, blue, green) serve different purposes
- Water electrolysis key for green hydrogen production
- Multiple storage solutions needed (compressed, liquid, carriers)
- Various end-use applications (power, transport, industry)

Key Lesson Learned on Japan Policy on Green Hydrogen

1.Economic:
- High production and infrastructure costs
- Price gap versus conventional fuels
- Need for massive capital investment
- Scale needed for cost reduction

3. Infrastructure:
- Need for new supply chains
- Transport and storage infrastructure required
- Integration with existing systems
- Safety considerations
- Important Lessons:

5. Market Development
- Government support crucial in early stages
- Long-term policy commitment needed
- International collaboration important
- Standards and regulations

2. Technical:
- Resource limitations (e.g., iridium scarcity for electrolyzers)
- Storage and transport challenges
- Infrastructure development needs
- Efficiency losses in conversion

4. Implementation:
- Start with existing applications and scale up
- Focus on hard-to-abate sectors first
- Build infrastructure progressively
- Develop multiple pathways simultaneously

6. Technology:
- No single solution fits all needs
- Multiple technologies needed for different applications
- Continue R&D while deploying current solutions
- Focus on efficiency and cost reduction

Insights on Day-2

Lecture 4 by Tokyo Metropolitan Government on Municipal Initiatives to Expand Hydrogen Energy

- In order to reach full-scale green hydrogen use in all sector by 2050, Japan plans to first build a strong foundation by 2030, focusing on technological development, cost reduction, and supply chain construction to expand demand and integrate hydrogen into society.
- The Tokyo Metropolitan Government's efforts to expand and promote hydrogen energy use include advancing hydrogen for transportation through refueling stations and fuel cell vehicles, encouraging green hydrogen adoption with projects like supply system development, and fostering public awareness through initiatives such as the Tokyo Hydrogen Vision.

Lecture 5 by JETRO on Business Development by Japanese Companies to Achieve Decarbonisation in Southeast Asia

- **JETRO Jakarta** focuses on strengthening trade relations between Japan and Indonesia, promoting Japanese companies' decarbonisation solutions, and supporting initiatives like the AZEC framework to advance CN in Indonesia
- **JETRO Bangkok** promotes carbon-neutral business partnerships between Thailand and Japan through business matching events, sustainable business catalogs, and collaborations.
- **Kanadevia** is advancing Power to Gas technologies in Southeast Asia to support decarbonisation, including the feasibility studies for green hydrogen, green ammonia, and e-methane projects, leveraging hydropower in Lao PDR.
- **Thermalytica** aims to redefine energy efficiency with innovative insulation materials like TIISA® superinsulation, targeting applications from residential and industrial insulation to hydrogen logistics and space habitats

Recommendations: Future Outlook

Growth Potential is Huge Growth Potential

- Global hydrogen demand expected to reach 430MT by 2050
- Major growth in transport and industrial sectors
- Increasing role in power generation
- New applications emerging

Critical Success Factors:

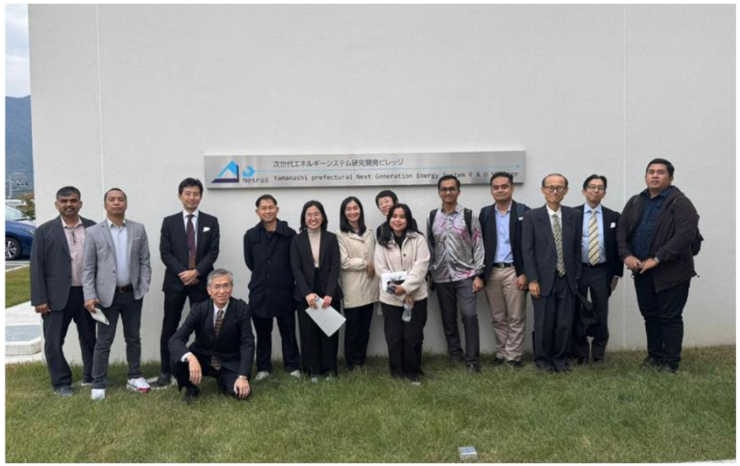
- Continued cost reduction
- Infrastructure development
- International cooperation
- Technology advancement

Implementation Strategy:

- Phased approach needed
- Focus on competitive advantages
- Build on existing infrastructure
- International partnerships crucial

Site Visit

Power to Gas Project



- Tokyo Electric Power Company (TEPCO) promotes electrification across society and integrates renewable energy sources with hydrogen to reduce fossil fuel reliance and carbon emissions.
- Yamanashi P2G Demonstration Project uses surplus solar energy for hydrogen production to replace fossil fuels in high-heat industrial applications, showcasing a model for local carbon reduction.
- TEPCO aims to scale up Power-to-Gas technology with targets like a 16 MW modular P2G system by 2025, pushing for carbon-neutral solutions in hard-to-electrify sectors, especially in industrial and transportation applications.

Summary of Small Group Discussions

Group A

- Further Support on Capacity Building, policy development and technical assistance , including: hydrogen, storage, carbon cpature, green building code,

Group B

- **Enhance Legal Frameworks:** Strengthen existing EE&C laws and develop new regulations to support energy efficiency measures.
- **Increase Financial Support**: Establish and expand funding mechanisms, such as the National Energy Development Fund, and international Fund and Loans
- **Promote Capacity Building:** Support in training and capacity-building programs to improve awareness and implementation of the latest energy efficiency technologies across various sectors.
- **Foster International Cooperation:** Encourage collaboration with international partners to share technology, expertise, and funding for renewable energy and energy efficiency projects.
- **Technical Support:** focuses on human resource development through capacity building and training programs, promoting research and development (R&D) for innovative energy-efficient technologies such as electric vehicles, hydrogen-ammonia systems, solar, wind, and biomass.

RS2

RS1

Way Forwards

RS3

- ACE to develop the ECAP 34 Summary Report, to be reviewed and submitted to participants, EE&C-SSN Focal Points, and ECCJ. ACE/ECCJ to share materials, including documentation with participants.

- Achieving carbon neutrality is a long journey requiring a phased approach, and the ASEAN-Japan Energy Efficiency Partnership (AJEEP) program, aims to support ASEAN countries in overcoming financing challenges and implementing sustainable energy solutions. Potential finance support including the Clean Energy Financing Initiative for Asia (CEFIA) and AZEC. ACE will continue to facilitate the cooperation for AMS

- ACE and ECCJ will review and explore the specific topic of Hydrogen Technology for the steelmaking process in the ECAP 2025 within the industrial sector scheme.

- Specific Technical Assistance required: Providing support in the form of advanced energy efficient and decarbonisation technologies, including hydrogen and CCUS (Carbon Capture, Utilization, and Storage) technologies. This includes facilitating the transfer of knowledge and technology from Japan to ASEAN countries to enhance their energy efficiency capabilities.

- Continue the AJEEP Scheme 5 Activity, especially on the Carbon Neutrality (CN) Diagnosis for Industry, taking lessons from ECAP 34. Seek continued support form ASEAN EE&C focal points in the preparation of the CN Roadmap by the industry.

スライド 15

RS0 can you specify what kind of exploration from the country report?
Rio Jon Piter Silitonga, 2024-11-01T04:07:23.785

ZY0 0 In the last session, there’s recommendation of how to implement the lessons learned from the WS to their respective country. Can be good inputs for ACE/ECCJ in designing EE&C activities
Zulfikar Yurnaidi, 2024-11-01T04:14:11.993

RS0 1 So is it for future AJEEP Activity? if then, I have revised the words ya
Rio Jon Piter Silitonga, 2024-11-01T04:18:10.840

ZY0 2 Thanks!
Zulfikar Yurnaidi, 2024-11-01T05:04:26.842

RS1 Can we also include the way forward for Web Pro here, in addition to further hands-on training for Web Pro to assist with building assessment?
Rio Jon Piter Silitonga, 2024-11-01T04:15:47.007

ZY1 0 Added
Zulfikar Yurnaidi, 2024-11-01T05:05:02.675

RS2 What does it mean with the lesson, then? Is there a necessity for improvement technically? Perhaps it would be good to highlight a bi
Rio Jon Piter Silitonga, 2024-11-01T04:23:39.649

RS3 by 2025?
Rio Jon Piter Silitonga, 2024-11-01T04:26:06.014

Thank You

See you on the next workshop