



LATEST POLICY AND LEGAL FRAMEWORK IN THE INDUSTRIAL SECTOR IN ASEAN TOWARDS CARBON NEUTRALITY

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

**Tokyo, Japan
Monday, 12 November 2024**

Presented by:

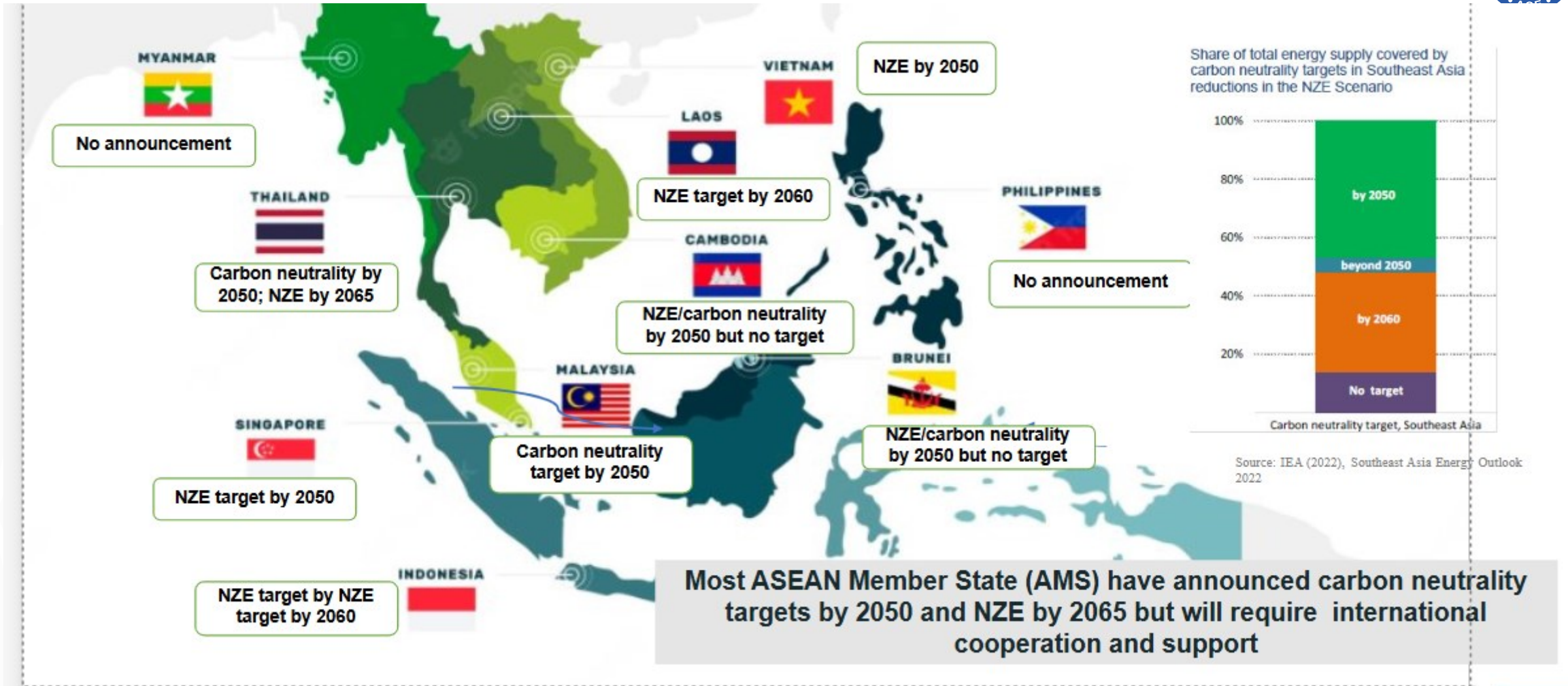
Rio Jon Piter Silitonga

Senior Officer

Energy Efficiency and Conservation (CEE) Department

ASEAN Centre for Energy (ACE)

ASEAN Pathways towards Carbon Neutrality: Stronger Cooperation is a Key

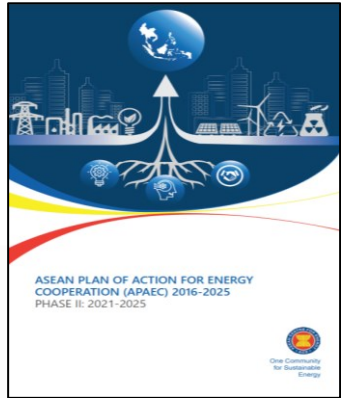


ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025

Phase II: 2021-2025

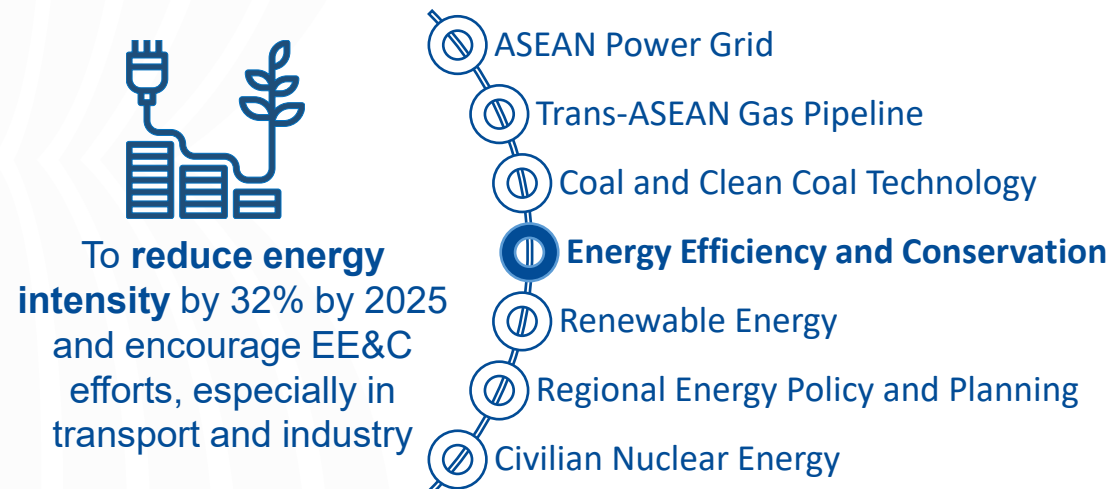


(APAEC) Phase II: 2021-2025

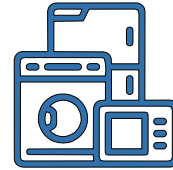


- Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All
- Accelerating Energy Transition and Strengthening Energy Resilience Through Greater Innovation and Cooperation

APAEC Programme Areas



Outcome-Based Strategies (OBS)



OBS1:
Expand, harmonise, and promote EE S&L (energy efficiency standards & labeling)



OBS2:
Enhance participation of private sector, financial institutions and clusters



OBS3:
Strengthen sustainability of EE in buildings



OBS4:
Pursue energy efficiency in transport sector

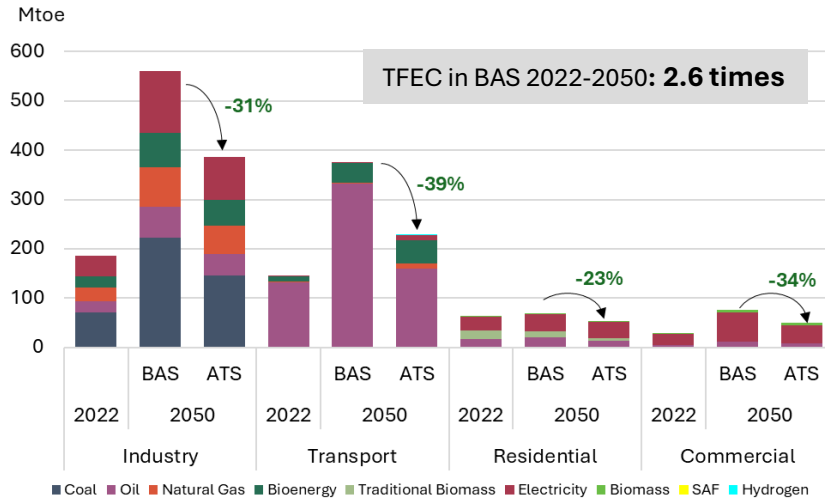


OBS5:
Advance energy efficiency and energy management in industry

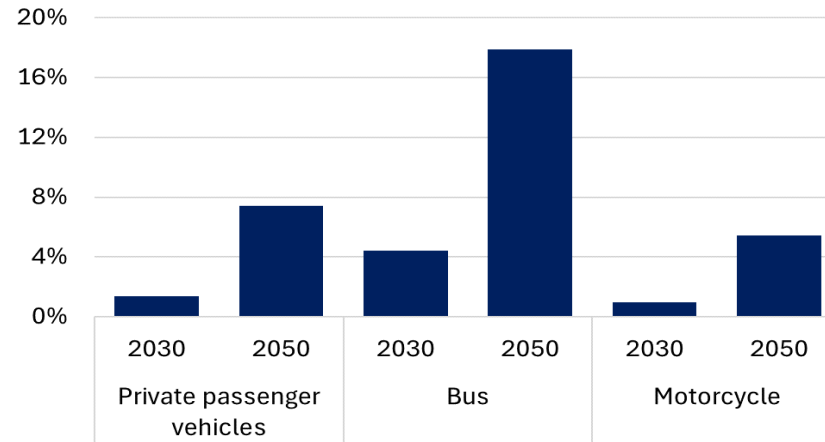
ASEAN Energy Demand



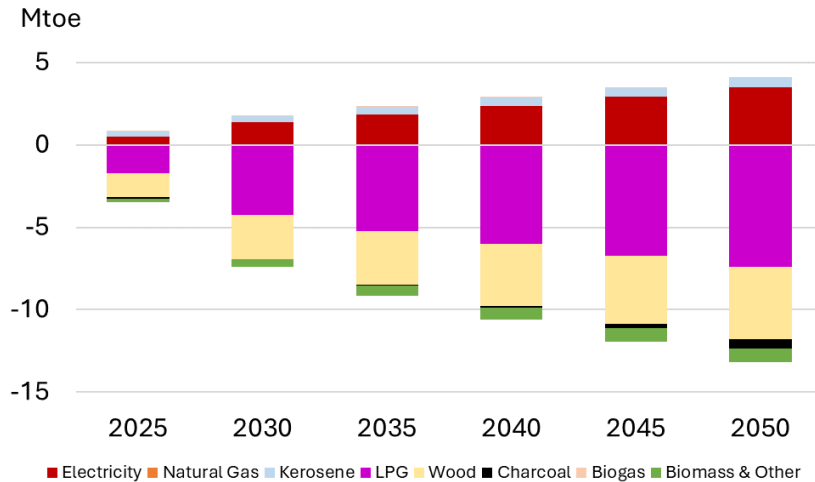
Final Energy Demand in 2050



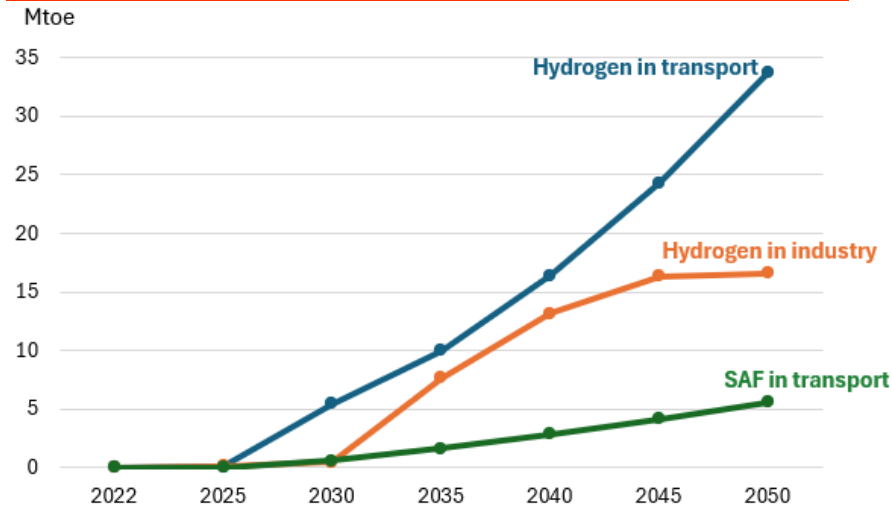
EV Penetration in Road Transport, ATS



Fuel Shift in Residential (Clean cooking), ATS



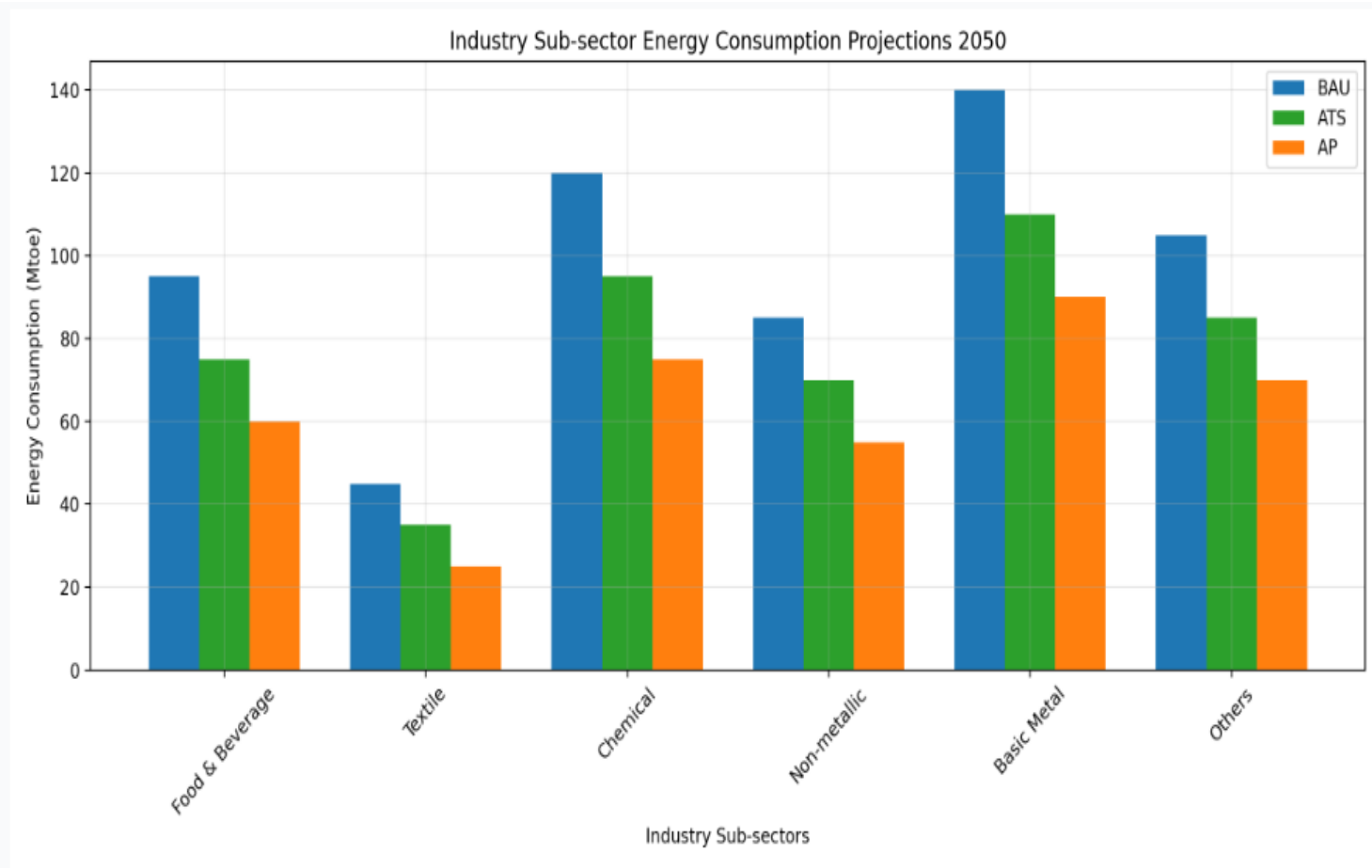
Emerging Technologies in Demand, CNS



- Energy demand in 2050 is **2.6 times** higher than 2022 (BAS)
- Industry** and **Transport** are the highest energy-consuming sectors, dominated by **coal and oil**
- Potential reductions of 33% (ATS) are driven by **efficient appliances and fuel economy**
- The need for **fuel shifting** to cleaner energy sources like **electricity, bioenergy, and hydrogen**.
- In road transport, **buses** leading the **EV penetration** in road transport (ATS)
- In residential, phase out of **traditional biomass** (wood and charcoal) and LPG to **electricity** by 2050 (ATS)
- Hydrogen in transport** grows exponentially

Notes: BAS = Baseline Scenario; ATS = AMS Targets Scenario; CNS = Carbon Neutrality Scenario

Industry Sub-Sector Energy Demand Projection by 2050



Sources: Author All Sources

- Basic Metal and Chemical industries are the most energy-intensive sectors, with Basic Metal projected to consume nearly 140 Mtoe under BAU (Business As Usual) scenario, highlighting these as priority sectors for energy efficiency interventions.
- All sectors show significant potential for energy reduction between BAU and AP (Advanced Policy) scenarios, with most sectors capable of reducing consumption by 30-40%, demonstrating substantial room for improvement through policy implementation.
- The Textile sector shows the lowest absolute energy consumption (around 40 Mtoe in BAU) but still maintains a similar proportional reduction potential across scenarios, suggesting that even smaller industrial sectors can contribute meaningfully to overall energy efficiency goals.

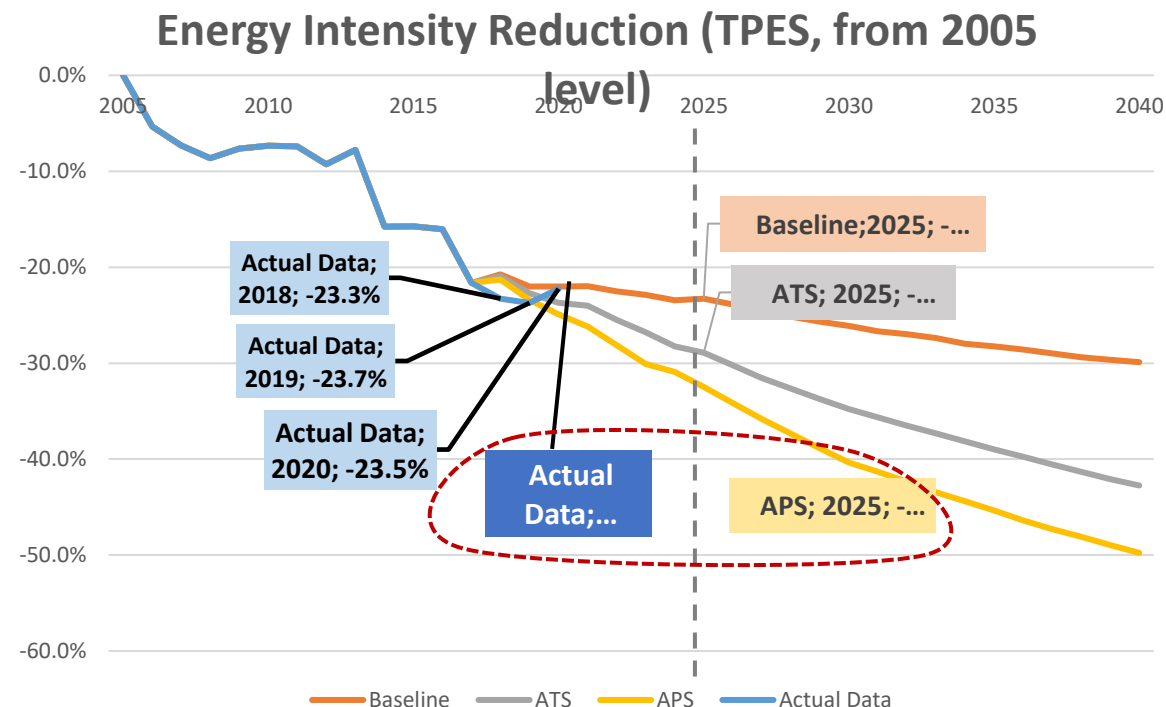
Sustainable and Energy Efficient Development in ASEAN: Where Are We Now ?



Energy Efficiency perspective

Regional aspiration in EE

- **Energy efficiency (EE)** is crucial to the regional sustainable development. The goal is to reduce energy demand cost-effectively, and thus reduce energy costs, CO2 emissions and other environmental impacts, and boost energy security and overall economic productivity.
- **ASEAN's aspirational target in EE** is set in the [ASEAN Plan of Action for Energy Cooperation \(APAEC\)](#) under the programme area number 4. Based on APAEC Phase I: 2016-2020, ASEAN had successfully achieved the energy intensity reduction target. By 2022, a 24.5% reduction was achieved. This was a significant achievement.
- Reaching the APAEC Phase II target for 2025, a **32% reduction** from 2005 level requires the region to put more ambitious efforts in achieving the target.



2022 Industrial TFEC Growth:
↑ **27.4%**
Industrial Energy Consumption:
185.7 Mtoe

Required Investment:
USD 600+ Billion
For Energy Efficiency
Improvements

70%

ASEAN Export Value
from Manufactured
Goods

Key Energy-Consuming Systems:

- Chilled Water Systems
- Compressed Air Systems
- Motor-driven Systems
- Lighting and Industrial Boilers

Key Barriers to Energy Efficiency Adoption:

- Lack of Capital (especially for SMEs)
- Limited Information and Knowledge
- Management Focus and Commitment Issues
- Uncertainty About New Technologies

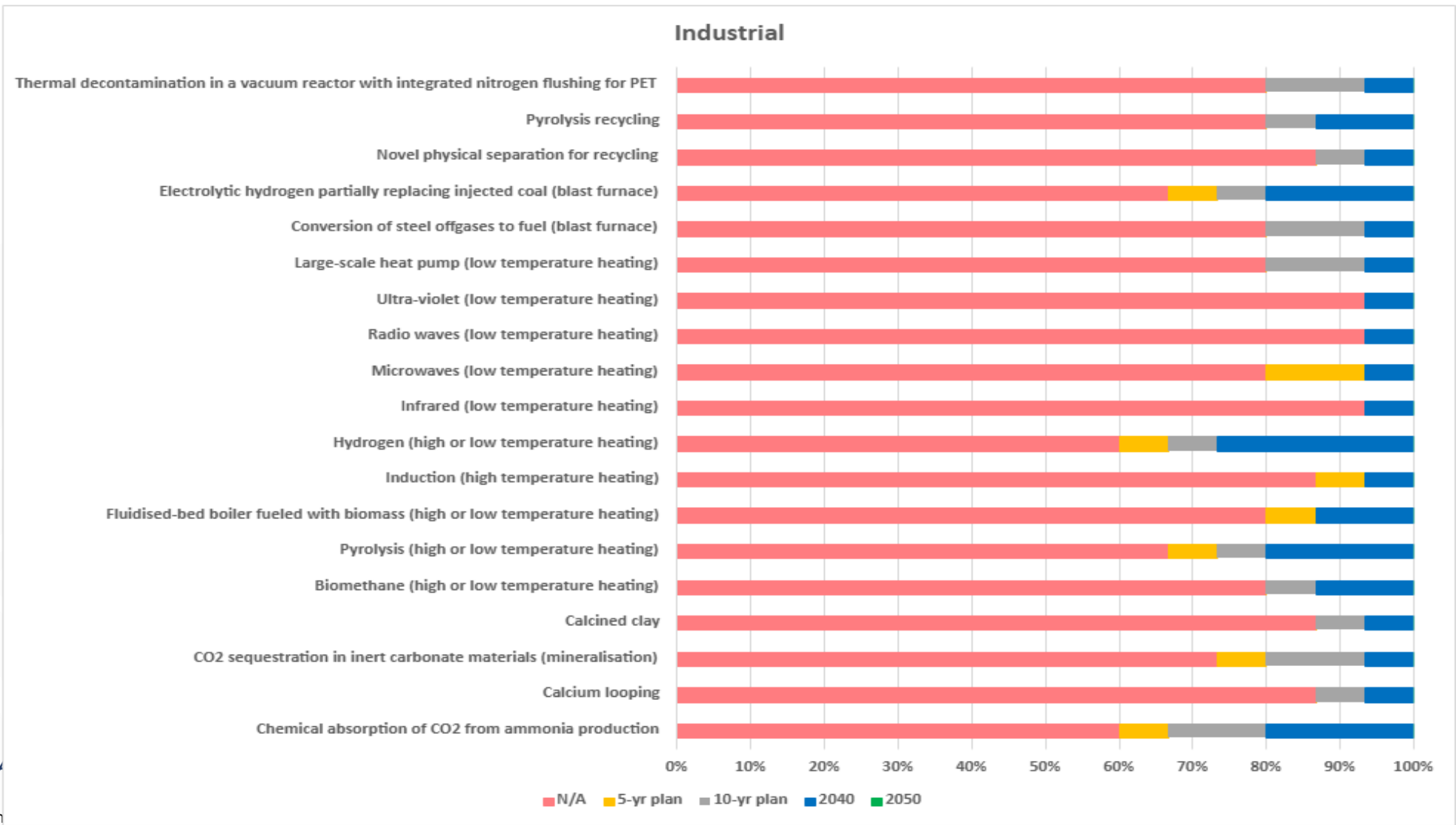
Sources: 8th ASEAN Energy Outlook (AEO8), IEA Southeast Asia's Energy Transition

- Policies such as information dissemination and training for the system optimization and energy efficiency options, awareness programs for top management, financial incentives especially for SMEs, and provision of equipment/system assessment tools and guidelines are some policy options that would help address these barriers.
- Providing attractive financial mechanisms for industry players in addressing capital barriers for adopting energy efficient technologies, such as through 1) Loan from the bank- industry-specific technologies or bundles; 2) Leasing mechanism- smaller projects but combined with credit guarantee; 3) Loan to Technology providers – 1-3 million US\$, also possible to combine with technology insurance; 4) ESCO finance – Credit guarantee and third-party verifier needed.
- ASEAN Member States could benefit from adopting Minimum Energy Performance Standard (MEPS) to limit the energy that motors consume.
- International best practices from the U.S. and many other major energy-consuming countries have established MEPS for electric motors. In addition, China, Europe and the U.S. have enacted or are developing MEPS for compressors, fans, and pumps. China leads the field with standards already in place for pumps, fans, and air compressors. The European Union has standards for pumps and fans and is in the process of developing regulations for compressors. In the U.S., pumps are subject to MEPS and the United States Department of Energy (U.S. Department Of Energy (DOE)) is currently engaged in rulemaking for fans and compressors. Outside of these three regions, very few countries regulate energy use in industrial end-use devices.

Source: 8th ASEAN Energy Outlook, 2024 ([AEO8](#))

Note: Baseline Scenarios (BAS); AMS Target Scenario (ATS); Regional Aspiration Scenarios (RAS); Carbon Neutral Scenario (CNS)

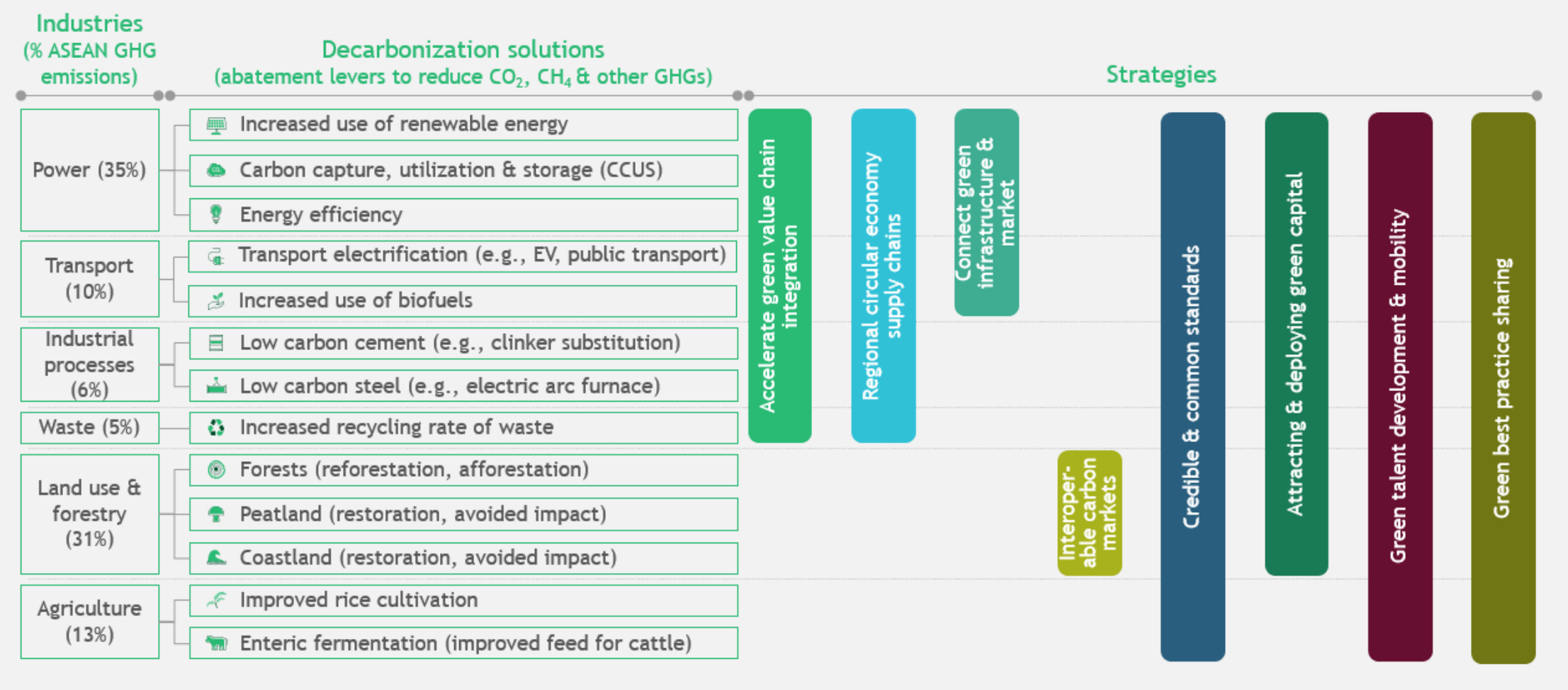
Potential Technology Towards Carbon Neutrality in ASEAN: Survey Result



Source: 8th A

Note: Baseline Scen

ASEAN Carbon Neutrality Strategy



Source: ASEAN Strategy for Carbon Neutrality



Economic Benefits by 2050

GDP Value Add
USD 3.0-5.3T

Green Investment
USD 3.7-6.7T

New Jobs
49-66M

Strategic Industrial Initiatives

Regional CCS/CCUS Hubs

- Singapore-Indonesia-Malaysia corridor
- Cross-border CO₂ management
- Integrated infrastructure planning

Green Manufacturing Value Chains

- Regional manufacturing integration
- Export market development
- Sustainable production standards

Critical Climate Context

- 11% potential GDP loss by 2100 if climate change left unaddressed
- 87M people living in flood-risk areas
- 5 ASEAN nations among 20 most climate-impacted countries

Source: ASEAN Strategy for Carbon Neutrality, 2024

ISSN 2963-539X
Volume 8, 2024

8th ASEAN ENERGY OUTLOOK 2023 - 2050



One Community
for Sustainable
Energy



DOWNLOAD HERE



<http://go.aseanenergy.org/AEO8>



ASEAN Centre for Energy
One Community for Sustainable Energy

To know more about the latest ACE Publications,
those are available for download from:

aseanenergy.org/publications



For further information or to provide feedback, please contact ACE at
secretariat@aseanenergy.org



ASEAN Centre for Energy



@aseanenergy



ASEAN Centre for Energy



@aseanenergy



ASEAN Centre for Energy

Thank You