

Policy Trends and Best Practices for Energy Efficiency and Conservation in the Transportation Sector in ASEAN

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About ASEAN Centre for Energy



Established in January 1999, ASEAN Centre for Energy (ACE) is an **intergovernmental organisation** within ASEAN structure that **represents the 10 ASEAN Member States'** interests in the energy sector.



Energy efficiency and conservation is key priority of ASEAN's regional energy cooperation



Enhancing Integration Security, Sustainabil

ASEAN Plan of Action for Energy Cooperation (APAEC) Phase II: 2021-2025

Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All

ASEAN PLAN OF ACTION FOR ENERGY COOPERATION (APAEC) 2016-2025 PHASE II: 2021-2025 St Companying Statements Emergy G

Accelerating Energy Transition and Strengthening Energy Resilience Through Greater Innovation and Cooperation

APAEC Programme Areas



To reduce energy intensity by 32% by 2025 and encourage EE&C efforts, especially in transport and industry



Trans-ASEAN Gas Pipeline

Coal and Clean Coal Technology

D Energy Efficiency and Conservation

(D) Renewable Energy

Regional Energy Policy and Planning

Civilian Nuclear Energy

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

	<u>OBS4</u> :
	Pursue
(\frown)	efficien
	transpo

Pursue energy efficiency in transport sector



<u>OBS5:</u>

Advance energy efficiency and energy management in industry

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Transportation is top energy consuming sector, heavily reliant on oil





ASEAN Total Final Energy Consumption by Sector

Data source. 7 ASEAN Energy Outlook (ALOT)

- The industry and transport sectors are the largest consumers of energy in ASEAN, with transport being the second-largest energy-consuming sector as of 2020.
- In 2020, the transportation sector was responsible for 34.7% of ASEAN's Total Final Energy Consumption (TFEC), making it one of the most energy-intensive sectors in the region.
- Both the AMS Target Scenario (ATS) and APAEC Target Scenario (APS) for 2050 show lower energy consumption in the transport sector compared to the baseline.

Transportation Consumption by Fuel Across Scenarios



Data source: 7th ASEAN Energy Outlook (AEO7)

- The TFEC of ASEAN's transportation sector grew significantly from 74.2 Mtoe in 2005 to 133.9 Mtoe in 2020 and is expected to reach 492 Mtoe by 2050, indicating a substantial increase in energy demand.
- Oil dominated the transportation sector's energy mix, making up 91.4% of TFEC in 2020, and is projected to continue contributing around 91.1% by 2050, despite growth in biofuels, natural gas, and electricity usage.

Road transport dominates transport's energy consumption



ASEAN Energy Final Demand by Transport Type, Baseline Scenario

Data source: 7th ASEAN Energy Outlook (<u>AEO7</u>)

- Road transport is the leader in energy consumption within the transportation sector, accounting for 92% of total energy consumption in 2025. This dominance is projected to continue with a 178.2% increase by 2050, rising from from 161 Mtoe in 2025, making it the largest consumer among all transport modes in ASEAN.
- While other modes like domestic air and inland waterways show growth, their energy consumption remains much lower compared to road transport, with domestic air reaching 30.09 Mtoe and inland waterways 11.20 Mtoe by 2050.



TFEC Projection by Road Transportation, Baseline Scenario

Data source: 7th ASEAN Energy Outlook (<u>AEO7</u>)

- Economic growth in ASEAN is expected to increase vehicle ownership, driving road vehicle energy consumption up by 10.8 Mtoe per year.
- By 2050, private passenger vehicles accounting for 50.3% of the sector's TFEC, dominate energy consumption within the road transportation.
- Commercial vehicles, including trucks, lorries, despite comprises only around 5% of overall road transport fleet, it will make up 32.8% of the energy consumption in the road transportation sector by 2050.



Oil dependency in transportation undermines ASEAN's energy security and environmental sustainability



ASEAN Energy Import-Export Balance and Projections, Baseline Scenario

Data source: 7th ASEAN Energy Outlook (<u>AEO7</u>)

- ASEAN has been net-oil importer since 2010. The projection shows a sharp increase in oil imports for ASEAN, leading to a significant energy security risk. This heavy dependence on imported oil makes the region vulnerable to fluctuations in global oil prices.
- To mitigate the dependency on oil imports, ASEAN must either reduce overall oil demand or shift to alternative fuels. The current trajectory of oil imports is unsustainable and poses long-term economic and security challenges.

ASEAN GHG Emissions Produced by Sector



Data source: 7th ASEAN Energy Outlook (<u>AEO7</u>)

- The transportation sector in ASEAN is one of the significant contributor to greenhouse gas (GHG) emissions, responsible for 20% of total GHG emissions from energy consumption in 2025. This is projected to increase dramatically to 175 MtCO₂-eq by 2050, responsible for 21% of the total GHG emissions, reflecting the sector's growing environmental impact.
- This highlights the need for targeted mitigation strategies in these high-impact sectors to manage and reduce future emissions.

Strategies to reduce oil demand and decarbonise transport sector: fuel switching and fuel economy



AVOID Avoid/Reduce travel, trips or need for motorized travel; reduce travel distance

SHIFT Shift to more energy-efficient, less carbon-intensive modes

IMPROVE Improve efficiency of operations, vehicle technology, fuels

Fuel Economy

Boostingfueleconomyinvehiclesreducesenergyconsumption and emissionsmakingtheitmoresustainable and efficient.

Biofuels

Biodiesel specifically offer a sustainable alternative to fossil fuels in transport, reducing reliance on oil imports and lowering emissions.

Electrification

Electrifying road transport with EVs and adequate charging infrastructure cuts fossil fuel use and emissions, improving energy efficiency.

Fuel economy policies have gained prominence in the ASEAN region, diverse approaches in its implementation



Status of Fuel Economy Policies in ASEAN

Country	Fuel Economy Baseline	Fuel Economy Standards	Fuel Economy Labelling	Fuel Economy-based Incentives
Brunei Darussalam		Planned		
Cambodia		Planned		
Indonesia	7.3 LGe/100km (2015)	Planned	Voluntary	Fuel Consumption and Emission-based Luxury Tax
Lao PDR				
Malaysia	6.6 LGe/100km (2015)	Voluntary - 2021	Voluntary	Incentives for Manufacturer
Myanmar	7.2 LGe/100km (2017)			
Philippines	7.7 LGe/100km (2015)	Planned	Voluntary	
Singapore	168 CO2g/km (2013)		Mandatory	Emission-based Rebates
Thailand	7.5 LGe/100km (2015)	Voluntary - 2013	Mandatory	CO ₂ Emission- based Tax
Vietnam		Voluntary - 2013	Mandatory	

Source: ASEAN EE&C Transportation Sector: Policy Trends and Best Practices (ASEAN EE&C Transportation Sector)

- Despite the commitment through the ASEAN Fuel Economy Roadmap to reducing the average fuel consumption of new light-duty vehicles sold in ASEAN by 26% between 2015 and 2025, none of the AMS have yet enacted mandatory fuel economy standards.
- Fuel economy incentives, including tax rebates and emission-based surcharges, are widely used across ASEAN to encourage the adoption of low-emission vehicles.

- Singapore: to encourage the adoption of vehicles with lower emissions, Singapore implemented the Commercial Vehicle Emission Scheme (CVES) and Early Turnover Scheme (ETS) by providing rebates or imposing surcharges depending on the emission levels of the vehicles.
- Indonesia: Indonesia is planning to implement energy management systems, particularly for logistics companies, indirectly impact the fuel economy of freight vehicles. Indonesia aims to optimize their energy use, including fuel consumption, rather than setting specific fuel economy standards for trucks.
- Philippines: The Philippines is planning to introduce mandates requiring logistics companies and other designated entities to implement energy management systems. Philippines has been proactive in implementing policies including the energy consumption of transport fleets. Specific regulations targeting the fuel economy of freight vehicles are still in the planning stages.

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Biofuel is one of main alternative for fuel switching in AMS's transport sector





- 5 AMS have biofuel blending mandates as measure to reducing oil import.
- Indonesia's biofuel mandate has evolved from B2.5 in 2008 to B35 in 2023, with plans to increase this rate further. Malaysia has implemented a B10 biodiesel mandate and aims for B30 by 2025.
- Noting the long-haul nature of heavy-duty vehicles, biodiesel is seen as viable alternatives for diesel.

Data source: 7th ASEAN Energy Outlook (<u>AEO7</u>)

The ASEAN Member States sets targets and incentives to increase the adoption of electric vehicles, mainly for passenger vehicles, motorcycles and buses



Data source: ASEAN EE&C Transportation Sector: Policy Trends and Best Practices (ASEAN EE&C Transportation Sector)

- ASEAN member states (AMS) are actively promoting electric vehicle (EV) adoption through a combination of fiscal incentives, infrastructure development, and supportive measures such as safety standards and pricing guidelines.
- ASEAN Leaders has agreed on developing regional EV ecosystem in the 42nd ASEAN Summit 2023.

EV Projected Penetration



Source: 7th ASEAN Energy Outlook

- Despite establishing these targets, conventional vehicles still dominate the passenger road transportation fleet into 2050. EVs only reach up to 2.5% of the fleet by 2025 and up to 9.6% by 2050.
- Faster adoption can be seen in buses and motorcycles due to relatively fixed driving patterns and affordability.
- Electric trucks are still challenging to be deployed due to its long-haul and heavy-duty nature, which requires a more extensive infrastructures.

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Overview of AMS EV Target

Initiative in advancing Carbon Neutrality in ASEAN's transportation and logistics



City Pilot Project



Source: Clean Air Asia, "Catalyzing Actions at the Local Level for Electric Mobility," 2021

- Pasig City and PHLPost, with Clean Air Asia, in the Philippines developed a pilot project aimed at improving operational efficiency through the use of smart electric vehicles (including 2-wheelers and 3wheelers) for postal services and local logistics.
- In March 2020, electric 3-wheelers were introduced by Pasig City for relief operations, with plans for a shared e-vehicle concept to maximize EV utilization.

Electrifying Urban Freight Transportation

We're building an inclusive EV ecosystem to make transportation more climate-friendly



Source: Grab (<u>Grab</u>)

 Grab is an example of a private sector initiative in ASEAN that is advancing carbon neutrality, particularly in the freight and logistics sectors. The company is working towards 100% decarbonization of its fleets by transitioning to electric vehicles (EVs) by 2030.

Sustainable Logistics in Southeast Asia

DHL Supply Chain commits EUR350 million in Southeast Asia to help strengthen customers' supply chain resiliency

10/17/2023, 09:00 AM CEST

This is part of a series of strategic investments by DHL Supply Chain over the past year, already adding up to EUR1.35 billion globally.



Source: DHL Press Release (DHL)

- DHL aims to achieve net-zero emissions by 2050 globally. Their investments in Southeast Asia include green logistics solutions, including energy-efficient warehouses and carbon offset programs.
- In Southeast Asia, DHL Express has introduced 80 electric vehicles in Singapore for last-mile delivery services and plans to install over 100 EV charging points across its service centers. This is part of DHL's broader initiative to reduce carbon emissions across its operations.

ASEAN Strategy for Carbon Neutrality





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Thank you!