

2024 Recap – Energy Efficiency and Electric Vehicle Insights

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To provide an update on the energy efficiency key trends in 2024 and expectations for 2025. This article highlights the intensive efforts on energy efficiency measurement and the electric vehicle development pathways in ASEAN.

The necessity for decarbonisation is increasing and leading to an acceleration of clean energy transition across ASEAN. A key emphasis is being placed on promoting electric mobility and implementing responsible energy consumption practices. The ASEAN region stands at the forefront of adopting sustainable practices, focusing on energy efficiency (EE) and electric vehicles (EV). As reported in the previous [2023 Recap - Energy Efficiency and Electric Vehicle Insights](#), the region are reinforcing their commitment to energy efficiency and the widespread adoption of electric vehicles. Throughout 2024, the region is intensifying green innovation to optimise the energy used for various energy-using activities, including in the transportation as the largest energy consuming sector, underscoring its commitment to a sustainable energy future.

“Responding to the urgent need for decarbonisation towards a low-carbon future, ASEAN Member States are experiencing a surge in initiatives to reduce energy consumption, maintain energy saving measures, and decarbonise transportation through environmentally friendly mobility. The region is reinforcing its commitment in promoting energy efficiency and the widespread adoption of electric vehicles by strengthening regional collaboration and fostering international support. The year 2024 signifies various milestones in these efforts, witnessing the government’s ambition in realisation

of EV target through green policy and enhanced infrastructure to bolster sustainable development.”

Shaping a Sustainable Future through Energy Saving Efforts

The ASEAN region is seeing significant strides in achieving the ‘low-hanging fruit’, aimed towards a greener landscape. Innovative solutions have grown in the past year, and the fast-paced transformation of technology has accelerated the change further. In the Philippines, a major mobile company [integrated Artificial Intelligence \(AI\) into its energy-savings programme](#). Through this measure, an 8% reduction in power consumption is achieved in one of the digital infrastructures. Meanwhile, a private mobile company in Thailand commenced its pilot project of promoting AI and big data to decrease energy consumption by optimising shutdown time. The project leads to a [13-18% energy consumption reduction per hour in 4G and 5G cells](#) without compromising network quality, reflecting a significant green development.

Vietnam offers an [accelerator programme](#) to boost investment in energy efficiency through innovative solutions for industry, transport, and green buildings from start-ups. The initiative supports Vietnam’s National Programme on Energy Efficiency and Conservation, which aims to achieve 8-10% savings in national energy consumption

by 2030. In the Philippines, a major building material company opened its first innovation hub facility to provide [sustainable building solutions](#) and serves as a co-creation lab to accelerate energy-efficient structures worldwide. This innovation hub is also a part of the company's commitment to support the Philippines' city in facing urbanisation, leading the example on how to build a structure with less impact on the environment.

Collaborative efforts are also established to leverage smart systems and green infrastructure as a sustainable solution. Vietnam's companies joined forces to develop smart Heating, Ventilation, and Air Conditioning (HVAC) and Variable Refrigerant Flow (VRF) systems digitally integrated with Building Management System (BMS) software [to optimise energy consumption in buildings](#). Whilst it benefits in reducing operational expenses, implementing these smart systems makes it easier to acquire the Vietnam Green Label, certifying environment adherence. Malaysia's companies are set to develop a [Smart and Green Industrial Park](#) through a agreement that aims to study, design, and establish a Green and Smart Energy Transition Roadmap. This benchmarks Malaysia's sustainable energy sector, such as integrating renewable sources to enhance energy generation efficiency and EV charging infrastructure.

Efforts to enhance energy efficiency in building design and retrofit are also arising. A company in Singapore completed the first [net-zero international school building](#). The design features sustainable materials and is expected to offset 216 tonnes of CO2 annually, generating more energy than it consumes. Another effort can also be seen in older office buildings in Singapore that [adopt new energy systems through open protocols](#), as older buildings could yield significant returns once energy-saving measures are implemented. Similarly, a property company in Thailand contributes to sustainability by [enhancing the performance of older buildings through retrofitting efforts](#), advocating boosted efficiency and minimising waste.

Singapore also took an interest in promoting

energy efficiency in the transport sector. At the end of June 2024, Singapore completed its first cargo and crew deliveries using a fully [electric cargo vessel](#). The vessel is equipped with swappable batteries and able to carry up to 25 tonnes of cargo. As a fully electric vessel, it produces zero emissions and aims to reduce operational costs by up to 50% through enhanced energy efficiency. With many MRT users, Singapore's rail operator has implemented [automating key functions](#) such as acceleration, braking, and coasting, which account for about 50% of the line's total energy consumption. Applied on Singapore's North-South and East-West Lines, the initiative achieved an 8% reduction in energy consumption for automatic train operations, equating to over 15 million kWh saved annually.

Policy Measures to Encourage Energy Efficiency Progress

The ASEAN region is witnessing a progress in energy efficiency initiatives by bolstering policy measures towards a green energy transition. The Philippines is intensifying its energy efficiency efforts, with the government showing a leading example through the [Government Energy Management Programme \(GEMP\)](#). Among audit and random energy spot-checks, this programme also initiates the adoption of low-cost Energy Efficiency and Conservation (EEC) measures to reduce the monthly consumption of electricity and petroleum products. In regard to the Administrative Order (AO) issued by the President, government offices are expected [to leverage energy conservation measures](#), with notable implementation in Central Visayas. The accelerated programme implementation, which advocates efficient electricity and fuel consumption utilisation, is expected to have an [estimated savings of USD 34 million](#).

In the private sector, the Philippines is expanding its action toward more inclusive coverage, along with incentives to push for energy efficiency efforts. The Department of Energy [introduced three new circulars under the Energy Efficiency and Conservation Act](#), adjusting the energy

consumption thresholds to include medium-sized industrial, commercial, and transport sectors' end-users. The clean energy transition toward more efficient use of energy can be accelerated if the country captures a wider segment of energy end-use economy. Complementing these efforts, the [CREATE MORE Act is expected to increase energy efficiency projects](#). The law offers flexible incentives, such as a 4–7-year Income Tax Holiday paired with a 10-year Enhanced Deduction Regime (EDR) or a 14–17-year EDR, eligible for projects achieving at least 15% energy savings.

Singapore is [broadening its Energy Efficiency Grant scheme](#) to reach more companies, including manufacturing, construction, maritime, and data centres. The grant programme identifies two tiers, supporting small and medium-sized enterprises (SMEs), non-SMEs, and selected sectors with expected lifetime carbon abatement. This expansion underscores the government's commitment to supporting companies in adopting energy-efficient technologies and practices, further strengthening Singapore's position as a leader in sustainable energy management.

Framework issuance for sustainable practices is also seen in Indonesia and Malaysia. Indonesia is focusing on cooling systems, whilst Malaysia is targeting sustainability in the data centre industry. Aligning with Indonesia's commitment to reduce 32-43% of GHG emissions by 2030, the country released [Indonesia's National Cooling Action Plan \(I-NCAP\)](#), emphasising energy-efficient cooling for air conditioning, food and healthcare cold chains, and industrial processes. Meanwhile, Malaysia's Ministry of Energy Transition and Water Transformation (PETRA) has introduced [a new regulatory framework to drive sustainable practices in its data centre sector](#). Among others, this initiative will promote the adoption of RE in Malaysia's data centre operators, marking a significant milestone in aligning the data centre sector with Malaysia's ambition toward reducing carbon intensity.

Escalating Decarbonisation Efforts in the Transport Sector

The transportation sector has emerged as a key focus in transitioning the region into a low-carbon future. Thailand is rising to become a [regional EV manufacturing hub](#), particularly driven by the extensive nature of the country's supply chain. In a significant move, a Thailand company partnered with the Asian Development Bank (ADB) for [a loan to fund 1,500 electric tuk-tuks](#), to cut emissions in the highly urbanised area, along with a 1.3 GWh expansion of Li-ion battery manufacturing. Supported by government policies and incentives to boost the demand side, [Thailand is set to double its EV sales](#) and attract foreign investment to set up local manufacturing plants.

[The launching of an EV taxi service in Lao PDR](#) enables the country to reduce the import of fuel and lessen air pollution, whilst creating over 1,000 new jobs. The taxi service company offer environmentally friendly transportation options, featuring a 100% EV equipped with airbags, safety belts, cameras, and sensor systems to ensure passenger safety. Meanwhile, Johor became the first city in Malaysia to introduce a [cross-border electricity bus](#). The bus will travel between Johor and Singapore, marking an important collaboration between these countries to tackle environmental issues and enhance regional connectivity. [In Brunei Darussalam, a new hybrid EV officially launched](#) in the first quarter of January. This further supports the country's goals toward reducing carbon emissions while ensuring sustainable driving that is accessible to all.

With the growing EV market, Singapore and Thailand are preparing for the effects of this boom. Singapore opened a [simulation centre](#) that provides hands-on experience in maintaining and repairing an EV, addressed to those looking to own one or those who want to dive into the work field. In response to the country's goal of becoming an EV manufacturing hub, Thailand's companies confront the environmental impact by developing ways for [end-of-life EV disposal methods](#), particularly focusing on battery recycling and the reuse of materials such as metal, plastic, and rubber.

Developing a Seamless Electric Vehicle Ecosystem

Infrastructure and ecosystem improvement become essential to bolster EV growth. Prior to realising the broader plan of implementing a 5,000 km EV charging highway across Southeast Asia, a Singapore EV charging service provider partnered to launch [charging networks](#) in Vietnam that span 1,700 km, expected to be commenced by the first half of 2025. Malaysia [launched its DC fast charger for EVs](#), comprised of dynamic load capability for when both charger guns are used simultaneously. These EV chargers will be anticipated in private and commercial buildings, meeting the rising needs of EV users on a smaller scale. Furthermore, the [Philippines' accredited list of EV charging service providers](#) has grown to 76, advertising more references for customers. The accreditation process is pivotal in promoting safety and reliable infrastructure for both, electricity grids and vehicles.

In Indonesia, with EV travellers increasing by five-fold in 2024, the State Electricity Company (PLN) aimed to add [2,000 public EV charging stations](#), which will be installed on iron and concrete electricity poles. During the Eid exodus in Indonesia, PLN prepared [1,299 public EV charging stations](#) and distanced every 23 km between South Sumatra to East Jawa, ensuring travellers could charge their electric cars without the need to search for specific locations. Likewise, Singapore set up [fast electric vehicle chargers](#) located primarily at commercial complexes and public car parks owned by the Housing Board, accommodating users' concerns regarding the availability of fast charging in public spaces. The charging points will be a mix of fast and slow chargers, with fast charging saving up to hours compared to the slow charger.

In the pursuit of transitioning to electric mobility, batteries became the linchpin in building a sustainable EV ecosystem. Member states are intensifying their efforts to boost battery production, innovation, and infrastructure to ensure greener roads ahead. For instance, Thailand has [enhanced its EV support program](#) in

support of becoming the regional hub for EV development, along with reaching the goal of carbon neutrality. The program ranges from incentives by shifting to EVs, to initiatives pushing for investments in battery technology and energy storage systems.

Indonesia launched its [first electric vehicle battery plant](#), located in West Java, as part of a USD 9.8 billion EV battery deal signed between Indonesia and a South Korean company in 2020. This development aims to boost Indonesia's role in the global EV supply chain, leveraging its rich nickel reserves as a key component of EV batteries. Moreover, Indonesia is expected to produce [31,000 electric motorcycle batteries](#), with 300 battery swap stations, to be established by the end of 2024. Catering to the increasing demand, the production of electric motorcycle batteries in 2025 is projected to reach 600,000, accompanying the goal to expand the network of public electric vehicle battery swap stations nationwide.

Driving Change with Policies in Green Mobility

Supporting policies will contain incentives and guidelines in accelerating EV transformation, seizing the momentum for investment in new technology and innovation. Cambodia finishing up its [National Policy on the Development of Electric Vehicles 2024-2030](#) as the country projected over a million electric two and three-wheelers and 100,000 electric cars deployed from 2030 to 2042. Meanwhile, Singapore will [prohibit the registration of new diesel cars and taxis starting January 2025](#), as part of its strategy to have all vehicles run on cleaner energy by 2040. The Land Transport Authority (LTA) has noted a decline in the number of new diesel cars and taxis, with diesel cars constituting less than 2.2% of new car registrations in 2023. This policy is expected to accelerate Singapore's decarbonisation effort.

Indonesia introduced [a new tax incentive, encouraging domestic demand for EVs](#). The incentive is given by removing the luxury tax on EVs for the 2024 fiscal year and extending the import tax exemption until the end of 2025.

Similarly, Thailand approves incentives for companies [switching large trucks and buses to battery electric vehicles through a tax deduction](#), available until December 2025 for eligible companies. In Malaysia, [the government announced a new EV road tax structure](#), prioritising affordability and increasing attractiveness to be accessible for all. The new structure calculates road tax based on the vehicle's kilowatt bands, reducing ownership costs compared to internal combustion engine (ICE) vehicles, and leading to a decrease annual tax.

In becoming an EV hub, Thailand and Indonesia encourage EV ecosystem manufacturers through incentives to increase production further. Thailand's Board of Investment (BOI) announced new incentives to boost EV manufacturing, particularly specialising in the [repair, repacking, and reuse of EV batteries](#), also offering cash grants for EV battery cell manufacturers. To support the long-term goal of becoming an EV production hub, Indonesia is prepared to incentivise companies that seek to invest in building EV factories in Indonesia. This path will boost the country's EV production capacity. The incentive came in the form of tax exemption related to imports, while still preserving the requirements of the domestic component level (TKDN) target.

ASEAN is making noteworthy steps in driving the region to transition into a low-carbon future. Despite varying progress and gaps in readiness across member states, the region's commitment to a sustainable, just, and inclusive energy transition remains steadfast. By uniting through collaboration, ASEAN holds the power to pave and lead changes toward a resilient energy future.

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