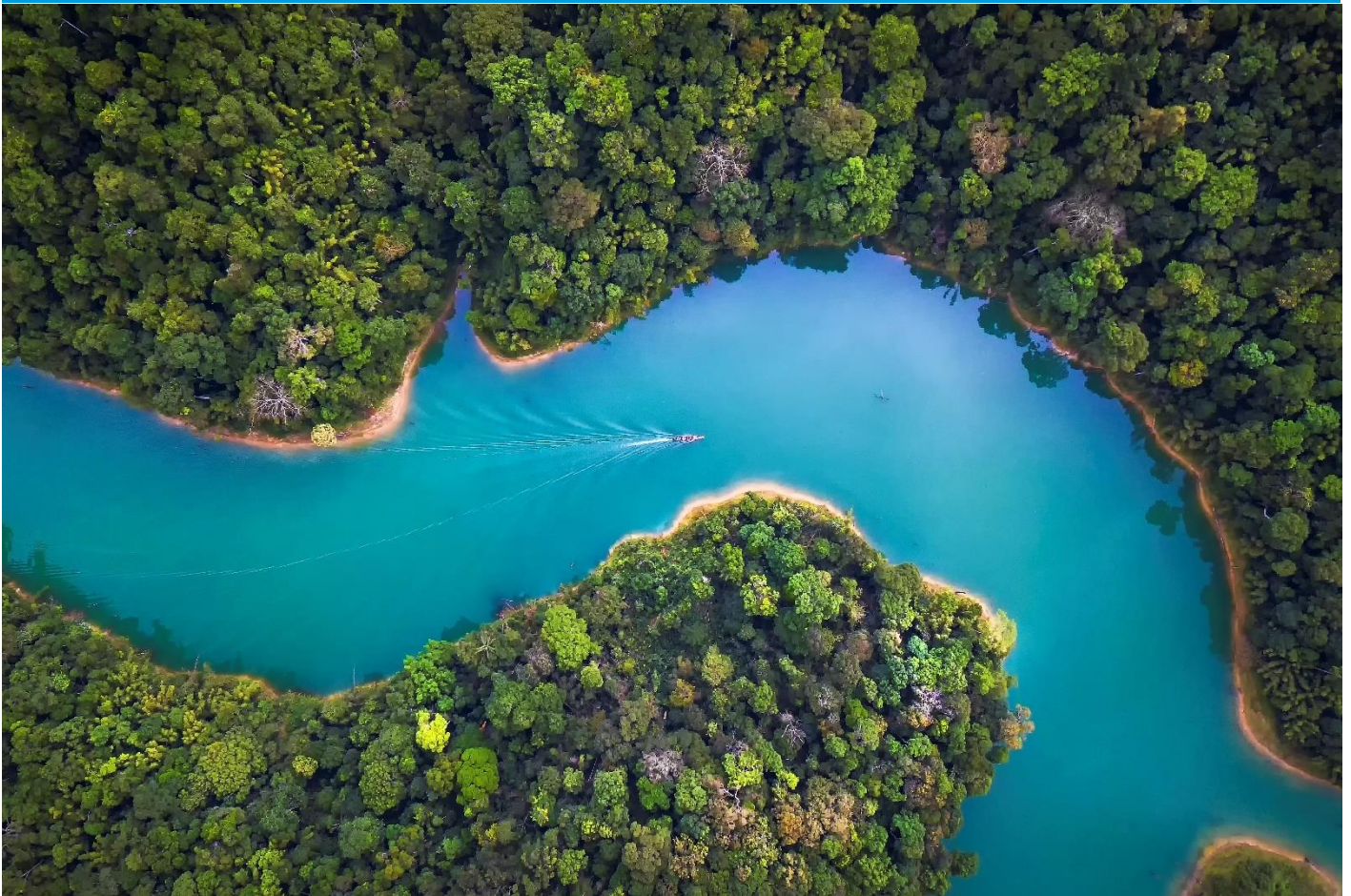


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COP29 - ASEAN's path to net zero: How are countries in Southeast Asia meeting their Paris Agreement obligations?



The 29th Conference of the Parties ("**COP29**") is currently taking place in Baku, Azerbaijan from 11-22 November 2024. The conference takes place annually between the member states of the United Nations Climate Change Conference, with the first one being held in Berlin, 29 years ago.

Since 2016, the primary focus of the COPs has been to monitor parties' progress on meeting their obligations under the Paris Agreement. Azerbaijan was selected as the host at the end of the last conference in December 2023, which took place in Dubai, United Arab Emirates ("**COP28**").

In this article, we will look at how the largest countries in the Association of Southeast Asia Nations ("**ASEAN**") are faring in meeting their obligations under the Paris Agreement and the various ways in which they are reducing their reliance on fossil fuels.

Status of Paris Agreement in ASEAN

Singapore, Cambodia, Indonesia, Malaysia, Philippines, Thailand, Brunei, Myanmar, and Vietnam all signed the 2016 Paris Agreement and have through their National Defined Contributions ("**NDC**") announced how they intend to implement their Paris Agreement obligations. All of them, with the exception of the Philippines and Indonesia, have committed to achieving net zero emissions by 2050, while Indonesia has committed to doing so by 2060 or sooner. The Philippines, despite being one of the largest carbon emitters in ASEAN, does not have a binding commitment to achieving net zero.

In order to achieve net zero emissions, many states in ASEAN plan to implement or are implementing various policies and strategies relating to the build out of renewables, increasing the use of hydrogen, requiring the use of sustainable aviation fuel ("**SAF**") and biofuels and implementing carbon capture and storage ("**CCS**"). Several of these countries also have plans to use nuclear power.

International collaboration is a key feature of the energy transition in ASEAN.

Singapore, in particular, is deepening its commitment to net zero through international Green Economy Agreements with the UK and Australia, aiming to promote green projects and cross-border energy trade. These partnerships aim to enhance Singapore's infrastructure for energy connectivity, advance green finance, and establish standards for sustainable trade, positioning Singapore as a key leader in ASEAN's energy transition.

Vietnam and Indonesia are also integrating Just Energy Transition Partnerships ("**JETPs**") to support a shift from coal while promoting renewables. In collaboration with international coalitions including the USA, EU, and Japan, Vietnam and Indonesia have each launched JETPs with substantial financial backing. Indonesia's JETP is focused on reducing coal use through enhanced funding, technology transfer, and infrastructure support to achieve a low-carbon energy transition. While Vietnam's JETP, backed by USD15.5 billion of funding, similarly aims to phase out coal, increase renewable energy capacity, and reach peak emissions by 2030 as part of its pathway to net zero by 2050.

In November 2023, ASEAN officially launched the ASEAN Power Grid Advancement Programme (APG-AP). This initiative spearheaded by the ASEAN Centre for Energy (ACE) is designed to support the creation and expansion of an ASEAN Power Grid.

Below we consider what progress has been made so far by these major ASEAN economies in each of these areas and the legal and regulatory tools being used by ASEAN countries to support their Paris Agreement obligations. It is important to note that, unlike the European Union, ASEAN is not a unified regulatory body but a coalition of sovereign nations, each pursuing its own pathways toward decarbonisation and Paris Agreement goals. ASEAN countries collaborate where possible, yet market fragmentation and reliance on public-private partnerships mean that progress varies significantly by country and sector.



Overview of power sector in ASEAN



Like much of the rest of the world, the power sectors in ASEAN contains a mixture of public and private players, with the past couple of decades seeing an increase in privatisation of the sector. This privatisation has mainly come in the form of independent power projects (IPPs) as well as some unbundling of supply and retail of power. In most ASEAN jurisdictions transmission and distribution remains in within the ownership of state-owned enterprises. Singapore's Singapore Power Group, Malaysia's Tenaga Nasional Berhad and PETRONAS, and Indonesia's Pertamina and PLN are examples of state-owned enterprises that play a crucial role in power infrastructure. However, in most of ASEAN, private enterprise is still encouraged, and private corporations can participate in the power sector either as generators, suppliers or retailers. For example, in Vietnam as of the end of 2022, EVN (the state-owned power group) owned and operates Vietnam's electricity transmission and distribution network and has a 38% share of Vietnam's power generation capacity.

As a result of this public-private mix in the energy make-up of ASEAN, the ability of states to successfully meet their obligations under the Paris Agreement will need to be through public-private partnerships and cooperation between state-owned power entities and private sector power corporations.



Renewables

The transition towards renewables is a critical part of meeting the goals of the Paris Agreement. COP28 called for a tripling of renewables generation capacity. The build out of the ASEAN grid and cross border interconnectors is helping to drive renewables growth across the region.

The Requests for Proposal for up to 4 GW low carbon energy supply by Singapore's Energy Markets Authority ("**EMA**") as well as the EMA's initial approval of import of renewables from Australia's Suncable group are clear indications of demand for renewables.

Indonesia has announced plans to increase its renewable energy capacity to 23% of its national energy mix by 2025 and 31% by 2030. This is largely through the use of hydropower, which accounts for over half of Indonesia's renewable energy.

Cambodia is harnessing both solar and hydropower and already sources well over half of its energy from renewable sources. Last year, Cambodia scrapped plans to build a USD1.5 billion coal fired power plant in favour of building a natural gas fired plant instead. The government stated this was because it wanted to demonstrate its commitment to cleaner power.

The Philippines, which is still heavily reliant on coal (which accounted for 60% of the country's electricity generation in 2022), has mandated that electricity suppliers must increase energy from renewable sources by at least 2.52% every year. While only 3% of the country's renewables pipeline is currently under construction, if the planned pipeline is adhered to, it will result in a 15-fold increase in solar and wind power by 2030. Although the pipeline is progressing more slowly than expected, it still marks a huge step forward for a country previously content to rely on coal as its primary energy source.

Vietnam has been a leader in renewables deployment with solar and wind forming important components of each of the last three five-year Power Development Plans ("**PDP**"). Vietnam has recently launched its Direct Power Purchase Agreement structure to allow generators to contract directly with large power consumers. As with many renewables build outs, Vietnam is facing grid issues and curtailment of renewables has been a feature of the sector. The need for grid reinforcement is clear and PDP VIII (for the period through to 2030) includes build out of the transmission system.

Nuclear



The ASEAN region, and indeed states globally, are in a period of revived interest in nuclear power. As can be seen with the agreements reached in the USA by Google, Amazon and Microsoft to secure nuclear power to support data centres processing AI, the renaissance of nuclear power is well advanced (particularly with respect to Small Modular Reactors and Advanced Modular Reactors).

The impact of the energy trilemma (balancing security of supply, equity/affordability, and sustainability) is pushing many countries to consider or reconsider nuclear.

The safety and efficiency of the modern generation of nuclear reactors can produce cleaner sources of base load energy to meet rising energy demand and balance intermittency and curtail risk created by renewables.

The ASEAN region has no active nuclear powerplants. Bataan nuclear power plant in the Philippines (completed in the mid-1980s) was the region's first to be built. As a result of the coup against President Ferdinand Marcos and the Chernobyl disaster in Spring 1986, it was never fuelled. In October 2024, the governments of the Philippines and South Korea signed a MOU to commence a feasibility study on how to commission the reactor by the early 2030s.

The Indonesian government has also included nuclear power plants in its General Electricity Plan for 2033. There are discussions in Indonesia about establishing a nuclear power plant to be operational in the next decade.

Thailand, Vietnam, and Malaysia are also discussing adopting nuclear energy and establishing nuclear facilities, but such talks are at a relevant early stage.

Singapore is also exploring the option of nuclear energy with a recently announced MOU with the USA to explore the potential for nuclear power as well as a cooperation agreement with the UAE. Singapore also plans to launch a roadmap later this year setting out ways that it can deploy nuclear technologies.

Hydrogen



Hydrogen is becoming a key component of ASEAN's efforts to reduce carbon emissions and make the transition to low carbon energy. In particular, Singapore's National Hydrogen Strategy stands out, focusing on advanced technology testing, research and development, international partnerships, infrastructure planning, and workforce development. This comprehensive approach positions Singapore as a regional leader in aligning hydrogen deployment with global technological advancements. Malaysia also through its Hydrogen Economy and Technology Roadmap, seeks to become a prominent player in the global hydrogen supply chain.

Ammonia, synthesised from hydrogen, serves as a key hydrogen carrier, allowing for easier transport and storage, which is critical for countries aiming to scale up hydrogen use in low-carbon energy systems. In Indonesia, the government and state-owned enterprises like Pupuk Indonesia and Pertamina, in collaboration with Mitsubishi Corporation, are working to develop green ammonia as part of the nation's low-emission fuel strategy. This includes co-firing ammonia with coal at power plants, supporting Indonesia's emission reduction goals under its NDC. Meanwhile, the Vietnam government is actively developing hydrogen-related policies and exploring ammonia's potential for future integration into its energy strategy.

In Singapore, ammonia is gaining traction as a low-carbon fuel in the maritime industry. The Maritime and Port Authority of Singapore ("**MPA**") recently collaborated on the world's first trial of ammonia as a marine fuel in a dual-fuel vessel operating within the Port of Singapore. Ammonia bunkering, which is the process of refuelling ships with ammonia as a low-carbon alternative fuel, is key to reducing greenhouse gas emissions in maritime transport. This trial, part of Singapore's National Hydrogen Strategy, aims to establish Singapore as a global hub for ammonia bunkering by developing infrastructure, safety standards, and technical know-how to support ammonia's role in maritime decarbonisation.

Sustainable Aviation Fuel and Biofuels

SAF is a renewable fuel made from sustainable sources that helps reduce carbon emissions in the aviation sector. There are several different SAF production methods. These include SAF derived from: (i) use of used cooking oil - known as FOG - fats, oils, and greases; (ii) biomass and municipal solid waste (known as MSW); and (iii) more recently, from blending of green hydrogen and CO₂ from direct air capture to create synthetic methane and then SAF from a gas to liquids process.

Many ASEAN countries have implemented SAF mandates. From 2026, Singapore is mandating a requirement for all flights departing Singapore to use at least 1% SAF and increasing this to 3-5% by 2030. Indonesia will mandate a 2% SAF blend by 2027, aiming to reach 5% by 2030. Meanwhile, the Philippines is in the process of finalising its SAF mandate, whereas Cambodia and Vietnam currently have no SAF mandates in place, highlighting varied commitments across the region. Given the amount of global air traffic that passes through ASEAN, particularly through Singapore's Changi Airport, the mandating of SAF will be a significant part of the region's energy transition.

In relation to biofuels - fuels produced from organic materials like plants or waste - several ASEAN countries are implementing ambitious targets. Singapore's MPA has established a provisional biofuel standard for marine fuel blends up to B50, representing a mixture of 50% biodiesel and 50% conventional fuel. The B50 blend allows for significant emissions reductions while remaining compatible with current marine engines and infrastructure. Blends like B20 or B50 are critical stepping stones for cleaner shipping as they allow for a phased transition to biofuels without requiring major changes to ships' engines. Singapore is expected to replace the provisional guidelines with a full set of permanent biofuel standards by 2025.

Meanwhile, Indonesia's Biodiesel Policy mandates a 35% blend (B35), in line with its goal of 23% renewable energy by 2025. Thailand has also set ambitious biofuel consumption targets under its Alternative Energy Development Plan, while the Philippines has introduced phased increases in coco methyl ester (CME) blending for diesel, rising from 3% in 2024 to 5% by 2026.

In contrast, Malaysia and Vietnam lack clearly defined biofuel blending targets, with Malaysia focusing more broadly on stabilising palm oil prices and developing export markets. In Cambodia, discussions are underway with Chinese companies to establish cashew processing facilities for potential biofuel use. This diverse approach highlights varying levels of commitment within ASEAN as nations pursue biofuel policies that align with both emissions goals and local economic interests.



Carbon Capture and Storage

CCS, a technology designed to capture carbon dioxide emissions from industrial processes and store them underground, preventing their release into the atmosphere and thereby mitigating climate change, is emerging as a key strategy in ASEAN's decarbonisation efforts. Singapore has set ambitious CCS targets, aiming to capture 2 million tonnes of carbon per year by 2030 and ramping up to 6 million tonnes annually by 2050. To support this, Singapore and Indonesia signed a Letter of Intent to collaborate on cross-border CCS, marking a significant step towards regional CCS integration. Indonesia's Presidential Regulation on CCS further establishes a regulatory framework to facilitate domestic CCS projects, aligning with its target to reach net zero emissions by 2060.

Malaysia and Thailand are making progress with developing frameworks to support CCS activities, while the Philippines, Cambodia, and Vietnam currently lack detailed CCS policies.

Conclusion

Ultimately, ASEAN countries, given their large combined population and energy output, will be critical to the global energy transition. It is generally agreed that the energy transition must be a 'just' transition. The energy reliance of ASEAN nations has largely been focussed on fossil fuels, with fossil fuels making up 83% of their energy mix. However, the majority of these nations have shown a strong commitment to becoming carbon neutral by 2050, with the Philippines as the only country not to commit to net zero.

Additionally, ASEAN countries are the source of many of the materials required in order to build clean energy infrastructure, such as tin, nickel, and bauxite. As mostly warm, tropical climates, containing vast coastlines, these countries are well placed to continue to develop renewable and clean sources of energy.

A focus of COP29 will be on the level of funding that should be given by developed nations to those still developing and many ASEAN nations will be beneficiaries of this. While the particulars of this will be hammered out at the intergovernmental level, there is no doubting the commitment of the majority of ASEAN nations to meeting their Paris Agreement obligations both now and in the decades ahead.

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Our team advises clients across the value chain of energy and natural resources and on the energy transition. More information on our work in decarbonisation is available on our dedicated hub page [here](#).

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