

2024 Recap – Renewable and Alternative Energy Insights

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To provide an update on the renewable energy key trends in 2024 and expectations for 2025. This article highlights the progresses of renewable and alternative energy implementation and policy updates, as well as addressing the existing hurdles about renewable energy financing in ASEAN region.

ASEAN has been keeping its stride in energy transition to achieve the low-carbon and resilient energy future. Continuing its effort in green energy transition, also summarised in the [2023 Recap – Renewable Energy Insights](#), the 2024 was marked as a year which the ASEAN Member States (AMS) accelerated their renewables and alternative energy deployment through international collaboration and green financial solutions.

Close to the completion of the [APAEC Phase II 2021-2025](#), renewable energy (RE) remains as the most critical element to accelerate the green energy transition. In 2022, the region had only reached 15.6% RE in Total Primary Energy Supply (TPES), leaving a slight gap towards the target of 23%. To fulfil the gap, ASEAN is planning to intensify regional collaboration, scaling up renewable technologies, and formulating APAEC Post 2025 to align with global energy trends. This insight elaborates notable progresses that have been done by ASEAN in fulfilling the existing renewable energy targets.

“ASEAN is accelerating its shift from conventional energy sources to renewable and alternative energy sources. The region explored more energy options, joined hands with partners, and pushed various initiatives. With abundant and diverse energy resources, transitioning towards clean energy is crucial not only to reduce emissions, but also to

provide a sustainable and resilient energy for the region in the brink of climate risks. The green energy transition targets present as a guide to ensure ASEAN's energy security, affordability, and sustainability in facilitating the region's rapid growth.”

Advancing Renewable Energy Adoption towards a Greener Future

In 2024, ASEAN has steadily made efforts toward a clean energy future by utilising the region's abundant RE resources. Solar energy remained dominant, followed by wind energy, bioenergy, and hydropower. These project accelerations are also followed by an enhanced policy approaches from the AMS and strong collaboration with various stakeholders to build a sustainable RE environment in the region.

To start with, solar installations have been growing each year and are widely adopted in urban and rural regions of Myanmar for homes, businesses and factories. The [rising demand of solar](#) energy in Myanmar was impacted by increasing oil price and unstable electricity supply. In the Philippines, the government has revised the omnibus guidelines in June 2024, [simplifying RE projects' application](#) processes and offering new incentives. These new guideline mandates investors to obtain a [certificate of authority \(COA\)](#) before signing a renewable energy contract. As a result, over 1,435 service

contracts with capacity more than 156,700 MW had been awarded to renewable energy developers. Singapore announced [a 2,671 miles undersea cable solar project](#) in partnership with an Australian company, while also exploring advanced [geothermal technologies](#) to expand its RE portfolio.

Still on the expansion of renewable energy in 2024, Vietnam signed an agreement to [export offshore renewable energy to Singapore](#) and started to work in its [first waste-to-energy plant](#). On its energy transition plan, Vietnam sets an installation of the country's future [largest onshore wind turbine](#) with capacity of 40 MW. Meanwhile, a Malaysian utility company plans to install [hybrid hydro-floating solar](#) as an effort towards clean energy transition. Moreover, Thailand has set a more ambitious goal to achieve [51% renewable energy in electricity generation by 2037](#). The country has started commercial operation 24 MW [floating hydro-solar hybrid project](#) which integrates solar energy, hydropower and a battery energy storage system (BESS).

Ultimately, the role of international cooperation on the advancement of RE project in ASEAN has been significant. ASEAN together with Australian enterprises held a mission to [transition the maritime industry with green energy](#). Through roundtable sessions and port tour, the program is aiming for knowledge exchange and opening business opportunity on hydrogen and ammonia production, hydrogen storage solutions, green methanol production, and more. Vietnam has also [deepened international cooperation with the Netherlands](#). Vietnam's Minister of Natural Resources and Environment discussed possibility of support in post-graduate training in renewable energy development, especially on solar power technology, offshore wind power, and RE integration.

Expanding Sustainable Fuel and Alternative Energy Sources Utilisation

ASEAN is exploring several alternative energy to bolster efforts in utilisation clean energy. On nuclear energy, the [Philippines](#), [Singapore](#), and

[Thailand](#) have signed a cooperation with international partner to start a feasibility study and plan the development of nuclear energy, while [Vietnam](#) will amend its national Power Development Plan (PDP8) to include nuclear and hydrogen energy. Meanwhile, Indonesia stated its plan to establish a dedicated government committee or Nuclear Energy Programme Implementing Organisation (NEPIO) [to prepare the first full-scale nuclear power plant](#) and identified [potentials sites](#) to host future nuclear power plants. The AMS also shows bold interest in Small Modular Reactor (SMR) nuclear technology with the Philippines setting a target of 1200 MW installed capacity [using SMR technology by 2032](#) and Thailand reported to debut a nuclear power plant project focusing on [public education and development of SMR](#).

There were also several initiatives to develop hydrogen in ASEAN countries. Brunei Darussalam, through Universiti Brunei Darussalam (UBD) enhanced research collaboration on ammonia technologies for [zero-carbon hydrogen production](#) with the aim of advancing sustainable energy technologies. Indonesia is developing five [clean hydrogen projects](#) which utilise the country's significant renewable energy resources and carbon storage capacity. Indonesia power utility (PLN) marked its commitment to boost renewable energy utilisation by signing a [green hydrogen agreement](#). In Vietnam, the Ministry of Industry and Trade is [drafting a hydrogen production strategy](#) using offshore wind turbines. Under the draft strategy, Vietnam will promote the development of hydrogen energy production and hydrogen-derived fuels in potential areas to target a hydrogen output of 100,000-500,000 tonnes by 2030.

In a significant step towards advancing clean energy initiatives, AMS conduct cooperation to explore utilisation of hydrogen. In Lao PDR, several partners collaborated to study and develop [the green hydrogen and green ammonia project](#) from renewable energy. The collaboration aims to meet the future clean energy demands of the industrial, transportation, and power generation sectors. Singapore did partnership with private company

for [joint research on hydrogen production](#). Moreover, Singapore also announced an upcoming initiative to build [hydrogen-compatible power plants](#) by 2030. Thailand power utility (EGAT) signed an agreement to accelerate the transition towards sustainable energy practices by fostering knowledge exchange and technological collaboration, particularly in biomass energy and [hydrogen energy storage systems](#). Particularly, Indonesia, Malaysia, and Singapore signed the 29th United Nations Climate Change Conference or [COP29 Hydrogen Declaration](#), committing to joint efforts in scaling up low-carbon hydrogen production.

The year 2024 also marked a stronger presence of Sustainable Aviation Fuel (SAF) in the region. Indonesia's state-owned company, Pertamina, was looking for used cooking oil (UCO) for [trial production of co-processed SAF](#) at its Cilacap refinery. The Philippines worked on developing [SAF roadmap](#) to spur local production of renewable jet fuels. With this plan on regulatory and policy improvements, the country has seen a lot of appetite for investments in the green energy sector. In Malaysia, a private company has secured a contract for a new biorefinery that will have the [capability to produce SAF](#) and hydrogenated vegetable oil (HVO) to cater to the growing demands of the global aviation and transportation industries. Furthermore, Brunei Darussalam also hosted the [ASEAN Project Development Training for Brunei Darussalam](#), which developed and presented six regional project proposal drafts, where Capacity Building for ASEAN Sustainable Aviation Fuel Development was included in the discussion. Singapore, supported by the Civil Aviation Authority of Singapore (CAAS) also launched the [Sustainable Air Hub Blueprint](#), which aims to improve SAF utilisation for 2026 and achieve 3-5% SAF adoption by 2030.

Addressing Financial Challenges for Energy Transition

As ASEAN is transitioning from fossil fuels to greener energy sources, financing the RE project has become one of the main agenda for the region. While in the past ten years RE has more

affordability compared to fossil fuels, the Carbon Neutrality Scenario (CNS) in [the 8th ASEAN Energy Outlook \(AEO8\)](#) projected that ASEAN will require USD 371.1 billion of average annual power sector investment cost by 2050, of which 77% of the fuels are renewables. Therefore, a financing scheme and investment will be prominent to advance the regional energy transition.

In terms of investment, renewable and alternative energy projects potentially attract promising commercial value. Cambodia's target on [clean energy is claiming to attract investments](#) to the country. In the Philippines, [RE commercial projects](#) with awarded service in 2023 alone were reported to surged by 26%. To be able to shift into RE and alternative energy, the AMS integrated green financing and investment to their policies and strategies. Several member states allocated a budget for RE investment, such as [Cambodia](#) (USD 5.78 billion), [Indonesia](#) (USD 235 billion), and [Malaysia](#) (USD 13.4 billion). The Philippines also granted approval for the issuance of Energy Development Corporation's (EDC) Fixed Rate [ASEAN Green Bonds valued at USD 102.8 million](#). Meanwhile, Singapore announced a [USD 100 million](#) support package to boost green growth in marine and offshore energy over the next five years.

The AMS continue to explore international support to finance their renewable and alternative energy projects. For instance, Indonesia managed to secure [USD 1.25 billion of green financing](#) for clean energy infrastructure development, especially Pumped Storage Hydropower Plants (PSHP). The initiative is part of Indonesia's broader efforts to transition to renewable energy and reduce carbon emissions. Meanwhile, the Philippines' Iloilo Province was set to become the focal point for [major RE investments including 35 MW solar farm](#). The province has garnered serious interest from at least three prominent entities with firm proposals to establish solar farms within its boundaries.

A new injection of capital through a green loan facility is set to bolster the development of renewable energy projects in the region. The International Finance Corporation (IFC) committed

[USD 64 million for RE projects](#) in Thailand, Indonesia, and Vietnam, where the fund would be utilised on solar farms, solar rooftops, biomass installations, and green finance framework development. In supporting the shift toward clean and sustainable energy in ASEAN, New Zealand also joined Japan and Germany in being contributors to the [Energy Transition Mechanism Partnership Trust Fund \(ETMPTF\)](#), committed USD 25 million for Southeast Asia. [Climate Investment Funds \(CIF\) invested USD 500 million](#) to support transition from coal to RE in the Philippines.

Renewable Energy Certificates (RECs) as a Financing Mechanism

In addition to direct investments and financing schemes, Renewable Energy Certificates (RECs) serves as a vital financial mechanism to support RE project deployment by providing transparency in renewable energy transactions. RECs function as market-based instruments that verify and track renewable energy generation and consumption, thereby offering an additional revenue stream for RE developers and enabling businesses to meet their sustainability commitments.

Several ASEAN countries have made significant progress in developing REC markets to enhance financing opportunities for RE projects. [Indonesia](#) has been advancing its carbon pricing and renewable energy policies, with a growing REC market driven by corporate demand. Indonesia Commodity & Derivatives Exchange (ICDX) started to socialise [REC for the tin smelter processing industry](#). Previously, ICDX has facilitated REC trading for the futures brokerage industry, through their subsidiary, Indonesia Climate Exchange. The purchase of REC for the smelter can ensure that the electricity they use to produce tin comes from renewable energy power plants. Moreover, as commitment to sustainable energy, Indonesia power utility (PLN) has announced a significant step through the sale of REC. The gold mining company has [purchased 275,000 REC units](#), equivalent to 275 Megawatt hours of renewable energy, from PLN's North Sumatra Main Distribution Unit.

[Malaysia](#) is focusing on strengthening regulations and control procedures to establish a structured and reliable REC market. On May 2024, Malaysia has [launched the commercial trading of REC](#) through the Malaysian Green Attribute Trading System (mGATS) to be operated by Tenaga Nasional Bhd. To ensure that the RECs produced in Malaysia effectively contribute to the country's carbon footprint reduction target and are fully accessible to corporations operating within the country where the benefits remain an attractive incentive for high-value investment in Malaysia, the RECs cannot be transferred abroad except through Energy Exchange Malaysia or other government-approved programmes.

In tandem to Malaysia's [increasing demand for REC generated in year 2024](#), a total of 1,000 GWh hydro REC and 100 GWh solar REC were open for bidding. It will enable companies and business entities to meet their environmental, social and governance (ESG) commitments. In addition, [Singapore](#) also collaborated with regional partners where Singapore and Malaysia conduct [a joint study to formulate a framework](#) that will recognise REC associated with cross-border electricity trade.

Meanwhile, [the Philippines](#) is optimising its REC market to meet RE targets of 35% by 2030 and 50% by 2040. On December 2024, the Philippines (IEMOP) [began trading REC](#). Each REC represents 1,000 kWh of electricity generated from renewable sources. The trading system fully returns to a market-driven mechanism under the Renewable Energy Market (REM). The REM provides a platform for trading these certificates, enabling compliance with the [Renewable Portfolio Standards \(RPS\)](#). To achieve renewable energy targets, the Philippine government has established RPS, which requires electricity suppliers to purchase a certain percentage of renewable energy. This policy has been in effect for over four years, and the required percentage has now risen to 11%. The REC can be used as a tool to meet this requirement, with electricity suppliers able to obtain the certificates through market trading.

Despite these advancements, REC markets in ASEAN face several challenges, including limited

supply, unclear ownership structures, weak regulatory frameworks, subsidised electricity markets, and low awareness among potential buyers. Addressing these issues [through knowledge sharing and enhanced regional collaboration](#) can help unlock the market's full potential as well as fostering the green energy transition.

To ensure that ASEAN remains an attractive destination for RE investment, the region must focus on [enhancing the bankability of projects, improving policy frameworks, and establishing transparent monitoring and verification systems](#). More importantly, policy readiness in terms of renewable energy investment should be prioritised to captivate more investors by providing a concise roadmap for potential RE project.

In summary, ASEAN's renewable energy journey reflects its strong commitment to a sustainable, low-carbon future, with notable progress in exploring new technologies, enhancing regional collaboration, and exploring alternative energy sources like hydrogen and nuclear. While challenges remain—particularly in meeting RE targets and securing the significant financing required—the region is actively addressing these through innovative policies, international cooperations, and initiatives to boost transparency and investment in the energy sector. As ASEAN looks beyond 2025 with the next energy blueprint, its collective efforts in advancing renewable energy and alternative technologies position it as a key player in driving a just and inclusive energy transition that aligns with global decarbonisation trends.

Energy insight is an inside analysis based on collected news for certain period of time, through the ASEAN Energy News Clipping of the ASEAN Energy Database System (AEDS). This edition covers the year of 2024.



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