



Building Energy Resilience and Integrity Southeast Asia's Way Forward in a Fractured Global Order

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Executive Summary

The global energy landscape is increasingly unstable, shaping vulnerabilities linked with external energy dependence. At the same time, energy demand in Southeast Asia continues to rise at a high pace. These effects increase the urgency for ASEAN to accelerate measures that strengthen its energy security anchored in regional resilience. To enhance the region's energy future, ASEAN could adopt a strategy that incorporates a planetary health perspective converging ecological stability, public health and human security. This involves relying on advancing the ASEAN Power Grid, while leveraging its critical mineral resources to enhance green partnerships and developing supportive clean measures, including nuclear energy. Each approach comes with a clear responsibility to mitigate potential risks to ecosystems and community well-being. This proposed integration of a planetary health perspective ensures that Southeast Asia's energy solutions do not undermine the people and systems that the energy transition ultimately seeks to protect.

Introduction

For Southeast Asia, the energy transition constitutes a technical shift from fossil fuels to renewables as well as a fundamental matter of planetary health: the convergence of ecological stability, public health and human security. As one of the world's most climate-vulnerable regions, Southeast Asia's decarbonisation trajectory is inextricably linked to the preservation of livelihoods and the mitigation of worsening climate disasters. Yet, the region's energy security remains largely dependent on fossil fuels, which are in turn linked to supply chains from afar. Institutional frameworks designed to support decarbonisation face several external strains. Recent developments – including a stagnating climate action agenda towards decarbonisation and major policy reversals by the United States, contributing to fossil fuel lock-ins, as well as disrupted energy supply chains in the Middle East – have exposed major vulnerabilities in these external dependencies.

This report argues that Southeast Asia must navigate the new reality by strengthening regional efforts towards the energy transition. Its solutions, however, should extend beyond embracing decarbonisation and must explicitly protect the region's environmental integrity. The report examines recent geopolitical-related energy disruptions and the region's strategic options, specifically the ASEAN Power Grid (APG), the critical minerals sector and deeper engagement with other energy pathways. This strategy will ultimately allow ASEAN to establish sustainable standards for its critical minerals, make considerable progress towards fulfilling its energy needs and simultaneously demonstrate a regional approach to energy resilience that can support – not undermine – the local ecosystems and community well-being the transition seeks to protect.

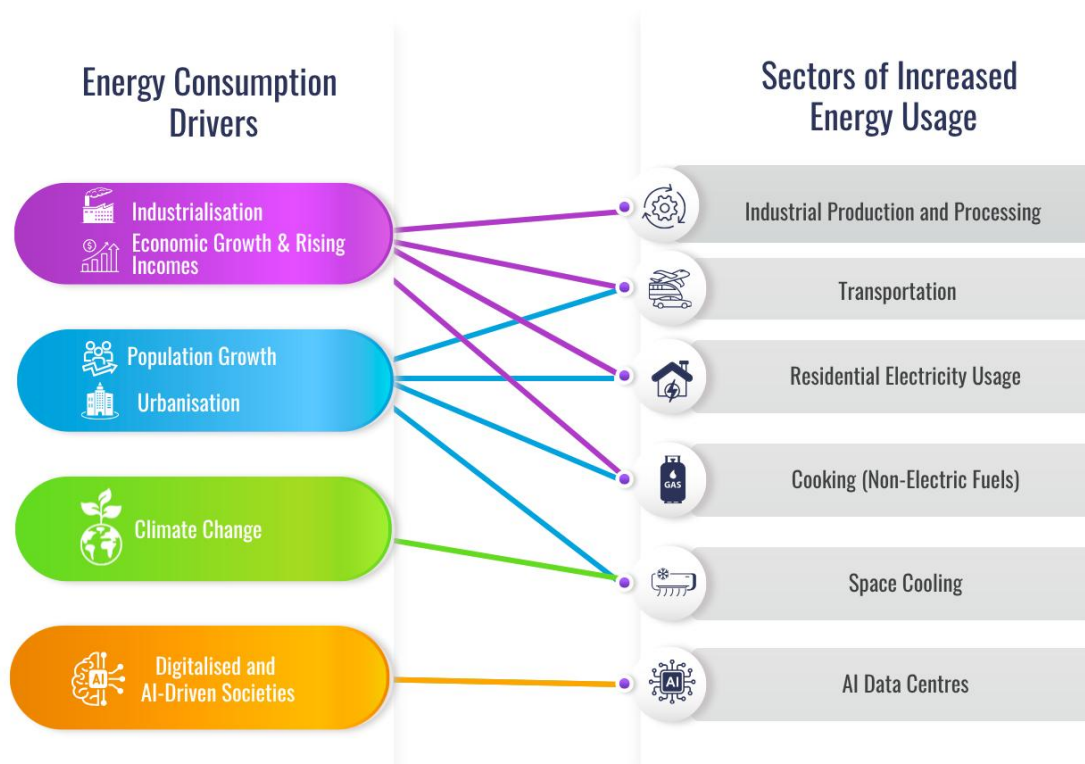
A Changing Energy Security Landscape for Southeast Asia

Weakening Global Political Will, Rising Regional Energy Demand

While climate action was cemented through a consensus among all countries to mitigate rising temperatures, growing divisions in recent years have limited meaningful progress at the global level. Most evidently, the United Nations Framework Convention on Climate Change (UNFCCC) has shown signs of stagnation. At COP30, the 30th annual meeting of the parties to the convention, held in 2025 in Belém, Brazil, the failure to finalise a robust fossil fuel phase-out roadmap marked a significant setback for global emission-reducing efforts. While Southeast Asian states have generally been reluctant to agree to strict roadmaps without substantial financial support first, the UNFCCC's unanimous decision-making model has increasingly been paralysed by conflicting national interests, exposing the fractured nature of the global transition. Ultimately, this has led to a system where neither financial needs nor deteriorating climate conditions are sufficiently addressed, highlighting the rising importance of solutions at regional, national and local levels instead.

The slowdown in the energy transition agenda is further complicated by a continuing upward trend in energy demand. Southeast Asia's year-on-year 2.5% energy demand increase in 2025 contributed to nearly doubling the global average increase and is expected to rise further in upcoming years owing to rapid economic, demographic and environmental changes.¹ Highlighted in Table 1, these factors are projected to drive a 160% increase in regional energy consumption by 2050.² Vital for present and continued economic growth, immediate energy security needs may therefore complicate regional progress towards decarbonisation and take precedence over long-term environmental and public health concerns.

Table 1: Key Drivers and Primary Areas of Impact on Energy Demand in Southeast Asia



External Instabilities: Impacts on Planetary Health and Policy

The recalibration of US policy has left a profound impact on the geopolitical landscape that threatens to derail Southeast Asia's sustainable development. The US war with Iran, carried out together with Israel, has exposed major vulnerabilities in energy supply chains crucial to Southeast Asia's stability by driving massive price hikes and supply shortages.

¹ International Energy Agency, "Global Energy Review 2026", 20 April 2026, <https://iea.blob.core.windows.net/assets/df903e1c-49c6-4757-8cbf-6fbcf7611a0/GlobalEnergyReview2026.pdf>.

² ASEAN Centre for Energy (ACE), "8th ASEAN Energy Outlook", 2024, https://storage.googleapis.com/aceweb-bucket-261225/pdf/publication/8th%20ASEAN%20Energy%20Outlook_SlnO1OrPHSdovI5igUIm1SVQHgSGYPAkvoE6aL7R.pdf, p. 59.

Beyond its direct involvement in conflict, however, Washington’s aggressive promotion of fossil fuels has spilled over into its foreign policy, effectively exporting carbon-intensive practices to Southeast Asia. Facing immense economic pressure from sweeping tariffs, governments are being coerced into prioritising immediate economic relief over long-term environmental health. To mitigate trade tensions, they have signed long-term agreements for US liquefied natural gas (LNG) and oil, shown in Table 2.

Table 2: Examples of Southeast Asian States and US Fossil Fuel Import Agreements and Pledges in 2025

Country	US Fossil Fuel Import Agreements and Pledges
Indonesia	Announced a landmark trade agreement with the US in July 2025, involving a US\$15 billion commitment to purchase US crude oil, LNG and refined fuels. It includes a US\$8 billion contract for US engineering firm KBR to build 17 modular refineries in Indonesia. ³
Malaysia	In June and July 2025, respectively, state-owned PETRONAS entered two separate 20-year Sale and Purchase Agreements with US LNG firms totalling imports of 2 million tonnes per year. ⁴
The Philippines	Has acknowledged plan to import LNG from the US. ⁵
Thailand	In June 2025, state-owned PTT signed a 20-year agreement securing an offtake of 2 million tonnes per year of LNG from a US supplier. ⁶
Vietnam	Finalised a new tariff accord with the US in July 2025, agreeing to LNG imports as part of trade rebalancing. ⁷

The import agreements represent generational infrastructure commitments. By signing 20-year contracts, states are effectively locked into fossil fuel dependency until the mid-2040s. These deals perpetuate the release of pollutants and greenhouse gases, undermining the region's 2050 climate goals and prolonging the public health burdens associated with fossil fuel combustion.

³ Paradigm Futures, “U.S.–Indonesia Trade Deal Opens Billions in Ag & Energy Exports”, 22 July 2025, <https://paradigmfutures.net/a/news/us-indonesia-trade-agreement-agriculture-energy/>.

⁴ Enerdata, “Malaysia’s Petronas signs 1 Mt/year LNG supply deal with the US’ Venture Global”, 7 July 2025, <https://www.enerdata.net/publications/daily-energy-news/malaysias-petronas-signs-1-mt/year-lng-supply-deal-us-venture-global.html>.

⁵ Manolo Serapio, Jr, “Philippines’ Marcos Seeks to Import LNG From Alaska, Envoy Says”, *Bloomberg*, 22 February 2025, <https://www.bloomberg.com/news/articles/2025-02-22/philippines-marcos-seeks-to-import-lng-from-alaska-envoy-says>.

⁶ ChemAnalyst, “Glenfarne and PTT Forge Strategic Alliance Featuring Alaska LNG Offtake Agreement”, 25 June 2025, <https://www.chemanalyst.com/NewsAndDeals/NewsDetails/glenfarne-and-ptt-forge-strategic-alliance-featuring-alaska-lng-offtake-agreement-37545>.

⁷ ARC Group, “Vietnam and US Reach Trade Accord”, 8 July 2025, <https://arc-group.com/vietnam-us-trade-accord/>.

Simultaneously, the United States has withdrawn its support for a clean transition. Its disengagement from the Just Energy Transition Partnerships (JETP), specifically the suspension of billions in pledged support for Indonesia and Vietnam, removes the financial safety net needed to retire coal plants early. Without this funding, the “just” aspect of the transition is under threat, leaving coal-dependent communities exposed to continued pollution and delaying the health benefits of a cleaner energy mix.

Furthermore, the closure of USAID initiatives, such as the Southeast Asia Smart Power Program (SPP), strips the region of vital technical assistance needed to modernise power grids for renewable uptake. This is a double blow of effectively penalising Southeast Asia’s clean technology purchases through tariffs imposed on their exports to the United States while withdrawing transition finance and technical support. Southeast Asia is forced into a precarious position where the cheaper and politically safer option is to regress towards environmentally damaging energy sources.

This new geopolitical outlook for Southeast Asia is further affected by China’s rapid renewable energy advancements. China’s domestic push for an expansion of the renewables industry in pursuit of its bid for global renewable energy dominance has driven massive innovation in green technology, which has enabled it to provide affordable solar panels, wind turbines and battery technologies needed for Southeast Asia to meet its climate goals. Nonetheless, as Southeast Asian states seek to avoid over-reliance on any single great power, the US repositioning leaves the region with the option of either enhancing its ties with China or risking severe long-term consequences for public health and ecological resilience.

Strategic Pathways for Southeast Asia’s Energy Resilience

Major developments in the global energy landscape underscore the urgency of building regional resilience. This common interest must now guide Southeast Asia to exert its own agency for long-term gains. Any options adopted require a deep understanding of their planetary health implications: seeking energy solutions that do not undermine the well-being of the local environment or social stability.

The ASEAN Power Grid

The APG presents a regional approach to address dual threats: energy insecurity and an energy transition slowdown. With ASEAN targeting a fully interconnected power system by 2045,⁸ the APG would enable Southeast Asia to enhance energy access at affordable rates and reduce heavy fossil fuel reliance.

The APG has the capacity to advance the region’s untapped clean energy potential. Currently, solar, wind and hydropower resources are often located far from major energy-consuming hubs without integration into national and regional grids.

⁸ Lin Bo-yu, “ASEAN endorses new cooperation frameworks to advance regional connectivity”, *Recessary*, 17 October 2025, <https://www.recessary.com/en/news/asean-new-regional-connectivity-frameworks>.

Consequently, clean energy supplies remain underutilised and curtailed, necessitating continued local reliance on fossil fuel generation.⁹ However, improved connectivity under current plans would enable significant gains towards a cleaner energy mix, including raising the overall share of wind and solar power by 23–25% by 2030.¹⁰

Progress in recent years demonstrates the APG’s feasibility. The Lao PDR–Thailand–Malaysia–Singapore Power Integration Project (LTMS-PIP) has connected the four states with an energy trading capacity of 200 MW,¹¹ inspiring the formation in 2023 of the Brunei–Indonesia–Malaysia–Philippines Power Integration Project (BIMP-PIP), for which feasibility studies are ongoing. In total, nine out of 18 APG interconnection projects are operational, yet power trade remains largely centred on bilateral rather than multilateral arrangements.

A full realisation of the APG carries significant structural challenges. Estimates indicate that an investment of US\$764 billion is required for high levels of renewable energy.¹² Despite a significant milestone reached in 2025 through the multi-billion-dollar ASEAN Power Grid Financing Initiative (APGF) supported by the Asian Development Bank (ADB) and the World Bank, the absence of a unified regulatory framework, varying national willpower, and state-ownership models have constrained private sector participation. Furthermore, concerns about ecological damage and the marginalisation of vulnerable communities from large-scale infrastructure projects require attention to fulfil commitments to a just energy transition.¹³

Recommendation 1: Deepen Regional Integration through the ASEAN Power Grid

The APG is the most direct mechanism for reducing external energy dependence. Recent progress must be reinforced by strengthening financing mechanisms and further harmonisation of domestic regulations. Thus, ASEAN must build on the recent launch of the ASEAN School of Regulation and the ASEAN Energy Regulators Network (AERN) to advance regulatory coordination. Developing a regional database and regional-level market regulations would help reduce investor uncertainty, marking important steps to de-risking projects and attracting large-scale capital.

⁹ UNESCAP, “ASEAN Power Grid: Accelerating the Region’s Energy Transition”, 20 January 2026, <https://www.unescap.org/story/asean-power-grid-accelerating-regions-energy-transition>.

¹⁰ Dinita Setyawati, and Shabrina Nadhila, “Wired for profit: Grid is the key to unlock ASEAN energy investment”, *Ember*, May 2025, <https://ember-energy.org/app/uploads/2025/05/Report-Wired-for-profit-ASEAN-PDF.pdf>.

¹¹ Energy Market Authority of Singapore, “Four Switches for Singapore’s Energy Transition”, September 2024, <https://ema.gov.sg/resources/corporate-publications/annual-sustainability-report-2024-2025/four-switches-for-sg-energy-transition>.

¹² ACE, “ASEAN Interconnection Masterplan Study (AIMS) III Report”, September 2021, https://storage.googleapis.com/aceweb-bucket-261225/files/publication/1766846416_01_AIMS-III-Phase-1-and-2_Summary-Report-Endorsed-AMEM39.pdf.

¹³ Margareth Sembiring, “Between Ambition and Implementation: Just and Inclusive Energy Transitions in Southeast Asia”, RSIS Commentary CO25239, 9 December 2025, <https://rsis.edu.sg/rsis-publication/rsis/between-ambition-and-implementation-just-and-inclusive-energy-transitions-in-southeast-asia/>.

Simultaneously, environmental impact assessments (EIAs) and community consultations must transition from being merely compliance “add-ons” to the foundational prerequisites of power grid advancements to mitigate risks of social instability and environmental destruction.

Critical Minerals and Planetary Health Standards: Addressing the Potential Paradox

Southeast Asia holds vast reserves of the critical minerals, such as nickel, tin and rare earth elements (REEs), that are essential for technologies sustaining the global energy transition. However, these resources often overlap with vital biodiversity hotspots and Indigenous lands, creating a “green paradox” where extraction occurs at major cost to public health, livelihoods and the environment.

With growing global interest in acquiring critical minerals, Southeast Asia faces mounting challenges in enforcing sustainable mining practices. A 2026 Chatham House analysis underscores that the accelerating geopolitical race to secure critical minerals and reduce supply chain dependencies carries severe planetary health risks.¹⁴ The ecological footprint is substantial: extracting a single tonne of rare earth elements generates up to 2,000 tonnes of toxic waste, including radioactive materials such as thorium and uranium, alongside millions of tonnes of wastewater. Exposure to these byproducts is clinically linked to lung diseases, neurological damage, cardiovascular dysfunction, reproductive harm and increased cancer risk.¹⁵ The legacy of rare earth extraction in China provides an empirical baseline for these risks. In regions like Ganzhou, in-situ leaching has caused severe soil acidification and water contamination, while in Inner Mongolia, tailings reservoirs – the leftover materials from the processing of mined ore – have seeped into groundwater, compromising agricultural viability and local livelihoods.¹⁶ Similar crises are now unfolding across Southeast Asia.

Currently, Myanmar, along with the wider Mekong subregion, is facing a crisis from illegal and unregulated mining of rare earths and tin, which is generating large volumes of toxic and radioactive waste. Also, vital waterways have been contaminated with toxic chemicals, rendering water unsafe for drinking and agriculture.

Simultaneously, nickel mining in other parts of Southeast Asia, including Sulawesi and Mindanao, has driven major deforestation, increasing the risk of deadly landslides and floods. Furthermore, the expansion of mining leases frequently overlaps with Indigenous lands, resulting in dispossession and displacement that fracture communities, undermine social security, and in some cases fuel grievances, violence and militarisation.

¹⁴ Patrick Schröder, “The Rare Earths Race Risks Environmental Disaster”, Chatham House, 3 March 2026, <https://www.chathamhouse.org/2026/03/rare-earths-race-risks-environmental-disaster>.

¹⁵ Wenyu Wang et al., “Toxic Effects of Rare Earth Elements on Human Health: A Review”, *Toxics* 12: 5 (2024).

¹⁶ Schröder, “The Rare Earths Race.”

Dependence on external energy supply chains complicates the picture. China leads globally in mineral processing and renewables manufacture, making it both Southeast Asia's most consequential decarbonisation partner and a major driver of extractive expansion. Chinese state-linked and private firms dominate investment in regional mineral supply chains, raising concerns that environmental costs are being offshored to Southeast Asia even as China cleans up domestically.

Simultaneously, increased US engagement demonstrates Southeast Asia's vital role in critical minerals supply chains. Bilateral US deals on critical minerals with Thailand, Cambodia, Vietnam, Malaysia and Indonesia in 2025 have challenged China's regional leadership. These deals, while intended for green technologies, often incur high environmental costs. Notably, in the case of the deal with Indonesia, Jakarta agreed to cooperate not only in the mining of its critical minerals but also in importing fossil fuel from the United States to reduce tariff rates.

Recommendation 2: Leverage Critical Minerals as a Strategic Bargaining Tool

Increased global demand for critical minerals strengthens ASEAN's bargaining position. However, ASEAN should avoid "extractive-first" lock-ins – a model where export of raw materials extracted is prioritised over value-added domestic manufacturing – since these are not only environmentally damaging but also economically exploitative. Future agreements with international partners must explicitly tie mineral access to clean technology transfer so that there are economic benefits for the region. They must also be tied to sustainable mining standards. The framework advanced at the 9th ASEAN Ministerial Meeting on Minerals (AMMin) in 2023 provides guidance for sustainable critical mining, emphasising legal obligations and community engagement to minimise environmental and livelihood impacts.¹⁷ This approach ensures that the renewable energy batteries powering the green transition do not leave Southeast Asia's rivers poisoned and its communities displaced.

The approach should be applied to new and existing partners, including China. Investments from China, which is increasingly positioning itself as a climate leader, must be aligned with ASEAN's high environmental, social and governance standards. ASEAN can leverage its strategic reserves to secure green technology transfers and strict safeguards, steering external capital from China from a driver of degradation towards genuinely sustainable development.

¹⁷ ASEAN.org, "9TH Ammin Declaration on Promoting ASEAN as an Investment Destination for Sustainable Minerals Development", 23 November 2023. <https://asean.org/wp-content/uploads/2023/11/02-Final-Declaration-on-ASEAN-as-a-Sustainable-Minerals-Investment-Destination.pdf>.

Other Energy Pathways

In a fracturing global landscape, Southeast Asia's best chance of achieving energy resilience comes from avoiding over-reliance on any energy source or partner. This requires further attention to its diversification strategies.

Alternative Energy Source: Nuclear

Nuclear energy has re-emerged as a potential pathway to reduce Southeast Asia's fossil fuel reliance while easing concerns about unreliable clean energy generation. With the Philippines, Indonesia and Vietnam targeting nuclear power plant utilisation within a decade, ASEAN's recent roadmap and awareness programme to advance readiness demonstrate new steps towards nuclear energy becoming part of the region's energy mix for the first time.

Regional discussions include both conventional reactors and small modular reactors (SMRs), the latter widely regarded as safer, more flexible and suitable as gateways for further projects.¹⁸ Nonetheless, nuclear advancements require substantial capital, robust regulatory frameworks and high levels of public trust. The future role of nuclear energy will depend less on ambition and more on ASEAN's ability to strengthen safety governance, financing mechanisms and regional cooperation.

Partnerships and Capital Sources

Geopolitical shifts underscore the urgent need for ASEAN to establish new, stable green partnerships. ASEAN's external climate options should be understood through differentiated partner roles. The United States and China remain unavoidable because of their scale, technological lead and strategic weight, but both also create dependence risks. The European Union matters less in military-strategic terms than as a regulatory and market actor whose climate standards shape trade and investment conditions. Australia, by contrast, offers a more predictable basis for cooperation in green supply chains and transition finance, amid its deepening economic integration with ASEAN. Its enhanced green commitments provide a new opening for clean energy initiatives in the Indo-Pacific region.¹⁹ At the same time, despite the slowdown among states and global organisations, private investments in green technologies have persisted. While currently constrained by limited cross-border regulatory coherence and investment frameworks in Southeast Asia, private investments carry the potential to play a greater role in bridging existing funding deficiencies.

¹⁸ Sharon Seah, Christopher Len, and Alvin Chew, "Nuclear Energy Developments in Southeast Asia", Trends in Southeast Asia, ISEAS-Yusof Ishak Institute, 14 June 2025, <https://www.iseas.edu.sg/articles-commentaries/trends-in-southeast-asia/nuclear-energy-developments-in-southeast-asia>.

¹⁹ Azalia, Nathania et al. "Navigating ASEAN's Decarbonisation Progress Through Collaborative and Sustainable Actions Amidst Global Shifts", ASEAN Climate Change and Energy Project, 29 July 2025. <https://accept.aseanenergy.org/navigating-aseans-decarbonisation-progress-through-collaborative-and-sustainable-actions-amidst-global-shifts>.

Recommendation 3: Advance Strategic Diversification

ASEAN's diversification requires actively progressing towards new green sources and partners.

The pursuit of nuclear energy remains a possible long-term supporting endeavour. ASEAN must strive to advance regional collaboration to strengthen regulatory preparedness, safety and public trust, supported by the enhanced financial mechanisms needed to advance ambitious projects.

Amid global instability, ASEAN should broaden its climate partnerships beyond the two principal great powers, the United States and China. Deepening engagement with Australia provides new opportunities. ASEAN should prioritise completing a formal green technology supply chain agreement and work towards a formal ASEAN-Australia Green Partnership, helping cement an energy transition relationship with a reliable, relatively lower-risk partner that is less entangled in great power rivalry. This should be framed not as a shift away from other partners, but as part of a diversification strategy. The European Union, for example, remains critical to ASEAN through climate diplomacy, finance and market access, even if its stringent environmental standards can also raise trade and investment adjustment costs. A balanced approach would therefore treat Australia as a complementary partner, the European Union as a regulatory and economic partner, and the United States and China as unavoidable but riskier poles of climate competition.

Finally, ASEAN should build on recent advancements such as the APG Financing Initiative by drawing on both catalytic finance and blended finance models that invite both high-risk and low-risk investment opportunities, respectively. As ASEAN's top financial hub, Singapore is well positioned to anchor this effort.

Conclusion

The onset of a new, disrupted global order and the withdrawal of US support for sustainability pose challenges to the planetary health and energy security of Southeast Asia. A faltering global framework for decarbonisation, fragile energy supply chains that are vulnerable to shocks from global conflicts and wars, and the US administration's push for fossil fuel exports threaten to force Southeast Asia into a race to the bottom, where immediate economic survival is purchased at the cost of long-term ecological and public health stability. The current trajectory that is marked by generational dependence on fossil fuel infrastructure risks entrenching the region's carbon lock-in.

Crucially, recent developments reveal that dependence on external guarantors is no longer a reliable strategy. Instead, the risks of such dependence, which cut across national boundaries, must be transformed into an assertion of sustainable energy sovereignty. The path forward requires a unified commitment to the APG to leverage domestic renewable potential. It also requires managing critical mineral wealth not as a commodity for export but as a lever for sustainable development.

Ultimately, the region's success will be measured not solely by the resilience of its energy supply but by the preservation of its planetary health, especially given the importance of diverse communities in Southeast Asia whose livelihoods are intertwined with their ecosystems. By rejecting the false binary of choosing between economic growth and environmental protection, ASEAN can pioneer a model of resilience that safeguards both its people and its ecosystems aligned with planetary health principles. Thus, rather than swapping one dependency for another, the proposed steps can chart a course beyond short-term geopolitical shocks towards a future driven by regional initiatives where energy security and ecological integrity are integrated and protected.

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About the Centre for Non-Traditional Security Studies (NTS Centre)

The NTS Centre conducts research and produces policy-relevant analyses aimed at furthering awareness and building the capacity to address non-traditional security (NTS) issues and challenges in the Asia Pacific region and beyond. The Centre addresses knowledge gaps, facilitates discussions and analyses, engages policymakers, and contributes to building institutional capacity in areas which include: Climate Security, Women, Peace and Security (WPS), Biosecurity, Food Security, Low-Carbon Energy Transition, Nuclear Safety and Security, and Planetary Health. The NTS Centre brings together myriad NTS stakeholders in regular workshops and roundtable discussions, as well as provides a networking platform for NTS research institutions in the Asia Pacific through the NTS-Asia Consortium.

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