ISSN 2651-5261 75 EUROASIA JOURNAL OF SOCIAL SCIENCES & HUMANITIES
Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Comparative Analysis of Renewable Energy Policies in Southeast Asia: Toward a Regional Energy Governance Framework

Merve KÜÇÜK
IKSAD Institute
mervekucuk476@gmail.com

Mohammad RUVI
IKSAD Institute
mohruvi@gmail.com, https://orcid.org/0009-0008-4459-3537

Abstract

As Southeast Asia faces rising energy demand and climate vulnerability, renewable energy has emerged as a critical policy priority across the region. This chapter provides a comparative analysis of national renewable energy policies in selected ASEAN countries—including Indonesia, Malaysia, Vietnam, and the Philippines—highlighting similarities, divergences, and the underlying political-economic drivers of energy transition strategies.Drawing on the lens of international political economy, the chapter investigates how national interests, political institutions, and external partnerships shape renewable energy frameworks and influence implementation outcomes. Special attention is given to regional cooperation mechanisms under ASEAN, and the potential for developing a more cohesive and integrated energy governance structure that supports decarbonization while ensuring energy security.

The chapter further explores the role of multilateral initiatives, foreign direct investment, and public-private partnerships in supporting renewable energy development. It argues that while Southeast Asia has made progress in policy formulation, significant gaps remain in regulatory consistency, cross-border infrastructure, and regional financing instruments. By emphasizing both comparative policy analysis and regional integration, this chapter contributes to the broader understanding of how emerging economies navigate the transition to clean energy within a politically and economically interdependent global system.

Keywords: Renewable Energy, Southeast Asia, Energy Policy, Regional Energy Governance, International Political Economy

INTRODUCTION

1.1 Comparative Analysis of Renewable Energy Policies in Southeast Asia: Toward a Regional Energy Governance Framework

Southeast Asia is at a crucial juncture in its energy transition, driven by rapid economic growth, urbanization, and industrialization that have resulted in increased energy demand. Climate change further threatens the region's environmental and economic stability; as such, renewable energy

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

(RE) has become a focal point in the policy agendas of ASEAN member states. These countries are striving to balance energy security with economic competitiveness while transitioning to cleaner energy solutions. Each member state has customized its strategies to enhance the deployment of renewable energy resources, although these approaches exhibit considerable variation influenced by national contexts.

A comprehensive comparative analysis of renewable energy policies in key ASEAN countries—specifically Indonesia, Malaysia, Vietnam, and the Philippines—reveals distinct policy frameworks, implementation challenges, and the political-economic dynamics affecting their progress toward energy transition. The ASEAN Plan of Action for Energy Cooperation aims to increase renewable energy's share in the region's energy mix to 23% by 2025, yet this goal encounters obstacles such as regulatory hurdles, inadequate investment, and aging infrastructure (Damu et al., 2023). Furthermore, employing an international political economy (IPE) perspective provides an in-depth understanding of how domestic interests and institutional frameworks shape national RE policies. Studies have indicated that government effectiveness does not significantly impact foreign direct investment inflows in the region, a finding that diverges from more optimistic views on the connection between governance and investment (Darmawan et al., 2024; Yusoff et al., 2024). Ultimately, foreign investment, multilateral initiatives, and public-private partnerships are identified as key accelerators of renewable energy adoption, emphasizing the need for improved coordination for effective regional cooperation.

The analysis underscores the urgent necessity for a more cohesive regional energy governance structure under ASEAN. Such a framework would facilitate enhanced coordination by addressing the existing variances in discourse among member nations, where energy self-reliance and security remain paramount (Taguibao, 2019). Additionally, collaboration among ASEAN states can alleviate barriers by leveraging shared resources and harmonizing policies. Currently, ASEAN's loose governance structure, often referred to as the "ASEAN Way," emphasizes consensus and mutual respect, which frequently impedes decisive action on cross-border energy initiatives (Aritenang, 2017). This chapter concludes with robust policy recommendations aimed at strengthening regional governance mechanisms, thereby promoting sustainable energy development while ensuring energy security across Southeast Asia.

1.2 Renewable Energy Policy Landscape in Southeast Asia

Southeast Asia's energy sector is presently navigating a complex landscape marked by a strong dependency on fossil fuels, which comprised approximately 83% of the total primary energy supply (TPES) as of 2022 (Chen & Mauzerall, 2021). This reliance poses a significant challenge as the region contemplates a transition toward more sustainable energy systems. Nevertheless, renewable energy (RE) capacity is experiencing substantial growth, motivated by declining technology costs, policy incentives, and commitments to international climate agreements. The adoption of renewable energy, however, displays substantial variability across ASEAN member states,

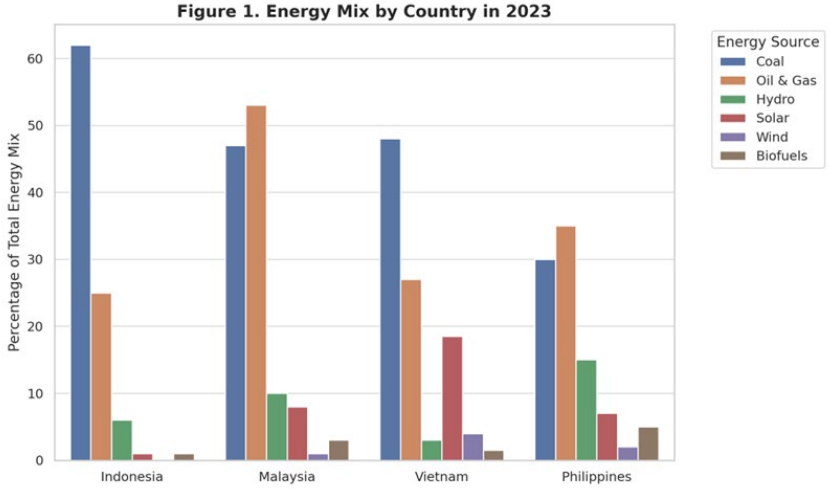
Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

influenced by factors such as resource endowments, economic objectives, and political environments (Guild, 2019)(Bertheau & Lindner, 2021; .

1.2.1 Fossil Fuel Dominance vs. Renewable Energy Growth

In the current energy mix, coal remains the dominant source at about 40%, particularly in countries like Indonesia and Vietnam, where it represents 62% and 48% of electricity generation, respectively (Sakti et al., 2023). The reliance on oil and gas constitutes around 43%, with Malaysia and Thailand exhibiting significant dependency on natural gas for power generation (Nguyen, 2024). In terms of renewable energy contributions, hydropower constitutes 10%, while solar, wind, and biofuels account for approximately 4%, 1.5%, and 1.5%, respectively (Azhgaliyeva & Mishra, 2021). The region has witnessed a remarkable rise in solar power capacity, increasing from 5 GW in 2018 to over 28 GW in 2023, mainly driven by the rapid development seen in Vietnam and Thailand (Azhgaliyeva & Mishra, 2021). Conversely, wind energy development lags due to land constraints, although there is notable progress in Vietnam and the Philippines (Wang et al., 2018)

Figure 1. Energy Mix by Country in 2023



Source: Compiled by author using data from Azhgaliyeva & Mishra (2021), Sakti et al.

In the current energy mix, coal remains the dominant source at about 40%, particularly in countries like Indonesia and Vietnam, where it represents 62% and 48% of electricity generation, respectively (Sakti et al., 2023). The reliance on oil and gas constitutes around 43%, with Malaysia and Thailand exhibiting significant dependency on natural gas for power generation (Nguyen, 2024). In terms of renewable energy contributions, hydropower constitutes 10%, while solar, wind, and biofuels account for approximately 4%, 1.5%, and 1.5%, respectively (Azhgaliyeva & Mishra, 2021). The region has witnessed a remarkable rise in solar power capacity, increasing from 5 GW in 2018 to over 28 GW in 2023, mainly driven by the rapid development seen in Vietnam and Thailand (Azhgaliyeva & Mishra, 2021). Conversely, wind energy development lags due to land constraints, although there is notable progress in Vietnam and the Philippines (Wang et al., 2018).

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

1.2.2 Key Drivers of Policy Variation

The landscape of renewable energy policy in Southeast Asia is profoundly influenced by diverse resource endowments. For instance, countries like Indonesia and Malaysia, which are rich in fossil fuel resources such as coal and natural gas, have seen slower adoption of renewable energy despite having significant solar and biomass potential (Muhamad & Mustafa, 2024). Conversely, the Philippines and Vietnam—countries with limited fossil fuel resources—are aggressively pursuing renewable energy targets, exemplified by Vietnam's Plan for Power Development (PDP8), which sets a goal of 50% electricity generation from renewable sources by 2050 (Bertheau & Lindner, 2021; . Economic priorities further complicate the energy transition; Malaysia and Thailand's export-oriented economies often prioritize energy affordability, thus favoring fossil fuels over renewable sources, whereas the Philippines and Vietnam focus on energy security by aiming to reduce dependency on energy imports through increased renewable energy deployment (Lim et al., 2021; Huang et al., 2019).

Political structures also play a critical role in shaping renewable energy policies. Countries such as Vietnam and Indonesia demonstrate a centralized planning approach where state-owned utilities dominate the sector, resulting in top-down policies prioritizing large-scale renewable projects but inhibiting private sector investment (Guild, 2019). In contrast, Malaysia and Thailand's market-driven strategies foster competitive bidding processes, such as Malaysia's Large Scale Solar (LSS) auctions, attracting foreign direct investment (FDI) despite facing challenges related to grid integration (Nepal et al., 2021; Sudaryanto, 2019).

1.2.3 Policy Instruments in Use

ASEAN nations are employing various policy instruments to promote renewable energy, as demonstrated in the following table:

Table 1. ASEAN nations'various policy instruments to promote renewable energy

Country	Key Policies	RE Share (2023)	2030 Target
Vietnam	Feed-in Tariffs (FiTs), PDP8	25%	32%
Indonesia	Just Energy Transition Partnership (JETP), FiTs for geothermal	12%	23%
Malaysia	LSS auctions, Net Energy Metering (NEM)	22%	31%
Philippines	Renewable Portfolio Standards (RPS), Green Energy Auction	29%	35%

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Source: These policy frameworks illustrate how each country is working to carve a unique path toward increasing the share of renewables in their respective energy portfolios (Azhgaliyeva & Mishra, 2021).

1.2.4 Challenges to Regional RE Expansion

Despite favorable conditions for renewable energy growth, several challenges impede faster expansion. Regulatory instability is a major concern, as seen with Vietnam's sudden cuts to FITs in 2020 which undermined investor confidence and halted developments (Bertheau & Lindner, 2021;. The Philippines faces obstacles from underdeveloped transmission infrastructure, hampering the integration of solar and wind energy into its grid, while Thailand grapples with congestion issues that limit the uptake of rooftop solar (Nepal et al., 2021; Nguyen, 2019). Furthermore, the ongoing subsidies for fossil fuels in Malaysia and Indonesia create significant economic distortions, impeding competitive pricing for renewable energy technologies Øverland et al., 2021;

1.2.5 Indonesia: Balancing Geopolitical and Domestic Energy Demands

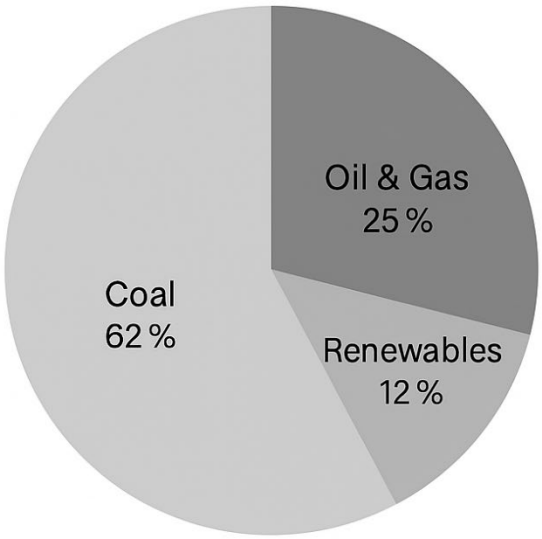
As Southeast Asia's largest economy and the third-largest coal exporter globally, Indonesia's energy transition is characterized by a unique set of challenges and opportunities. The nation confronts the need to reconcile its domestic energy security imperatives and coal-dependent economic structure with burgeoning international climate commitments. Additionally, its decentralized archipelagic grid system complicates the deployment of renewable energy (RE) initiatives, necessitating a comprehensive approach to energy policy and strategy.

Current Energy Landscape

In 2023, coal remains the predominant source of electricity generation in Indonesia, constituting approximately 62% of the energy mix, complemented by oil and gas which account for a further 25% (Azhgaliyeva & Mishra, 2021). Indonesia's status as the world's leading thermal coal exporter is underscored by its annual shipments of approximately 400 million tonnes (Azhgaliyeva & Mishra, 2021). Despite significant potential for renewable energy development, Indonesia's RE share stands at only 12% of the total energy mix as of 2023, primarily derived from hydropower (6%) and geothermal (5%). Meanwhile, solar energy contributes less than 1%, with wind energy remaining virtually untapped (Wang et al., 2018).

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Figure 2: Electricity Generation in Indonesia, 2023



Source: Azhgaliyeva & Mishra, 2021

Policy Framework for Renewables

Indonesia has established several national targets aimed at boosting renewable energy, including a goal of achieving 23% RE in its energy mix by 2025, a target that has been delayed from the original 2020 aspiration. Additionally, Indonesia aims for net-zero emissions by 2060, with ongoing discussions surrounding the phaseout of coal. Key instruments in this framework include:

- **Feed-in Tariffs (FiTs)** that support geothermal, biomass, and small hydro developments, albeit subject to revisions (Ambarita & Kawai, 2018).
- **Fiscal incentives** such as tax holidays and import duty waivers for renewable energy projects promote investment in the sector (Ambarita & Kawai, 2018).
- **State-led initiatives** primarily managed by the state electricity company (PLN), which remains a dominant force in geothermal energy development (Irbah et al., 2025).

Implementation Challenges

Indonesia faces multiple challenges that hinder its renewable energy progress:

1. **Policy Inconsistency**: Frequent regulatory changes have created uncertainty, exemplified by a recent cut in solar FiTs. Additionally, the permitting process is cumbersome, requiring approvals from multiple agencies, leading to delays in project initiation (Yasmin et al., 2024).

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

2. **Fossil Fuel Subsidies**: The government provides extensive electricity subsidies that lower PLN's selling price below actual costs, which discourages private investment in renewable energy solutions. Diesel subsidies also hinder off-grid renewable initiatives, especially on Indonesia's remote islands (Setiawan et al., 2025)(Judijanto et al., 2024; .
3. **Grid Limitations**: The Java-Bali grid, which services about 80% of Indonesia's electricity demand, suffers from congestion. Furthermore, outer islands experience significant deficiencies in transmission infrastructure, limiting the integration of renewable energy sources (Ghazali et al., 2025).
4. **JETP Roadblocks**: Although the Just Energy Transition Partnership (JETP) holds promise for financing the transition, progress has been slow due to bureaucratic hurdles and disputes over compensation for early coal plant retirements (Setiawan et al., 2025)(Ghazali et al., 2025).

Case Study: Geothermal vs. Solar Development

The contrasting trajectories of geothermal and solar development in Indonesia exemplify the challenges faced:

- **Solar**: Utility-scale solar installations total only around 0.3 GW, hampered by limited private sector involvement and significant land permitting delays (Setiawan et al., 2025). Although solar power has vast potential—particularly given Indonesia's equatorial location—its growth has lagged due to inadequate infrastructure and investment climate (Yasmin et al., 2024).

Future Pathways

To advance its renewable energy transition, Indonesia may consider several strategic pathways:

1. **Accelerate JETP Implementation**: Streamlining approvals for key projects, such as the planned solar and battery system, can catalyze rapid expansion in the renewable sector (Setiawan et al., 2025).
2. **Reform Subsidies**: Redirecting fossil fuel subsidies to facilitate renewable energy grid integration, including investments in battery storage, would enhance economic viability for RE projects (Ghazali et al., 2025).
3. **Decentralize Energy Systems**: Promoting mini-grid systems for the over 2,300 off-grid islands can improve energy access and integrate renewable sources such as solar with diesel generators (Judijanto et al., 2024; Paluseri et al., 2025).

In summary, Indonesia's unique position in the global energy landscape presents both significant challenges and immense opportunities as it seeks to transition toward a more sustainable energy

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

future, balancing geopolitical considerations with the pressing demand for domestic energy security.

By addressing policy inconsistencies, enhancing grid infrastructure, and fostering private sector engagement, Indonesia can make meaningful progress toward its renewable energy targets.

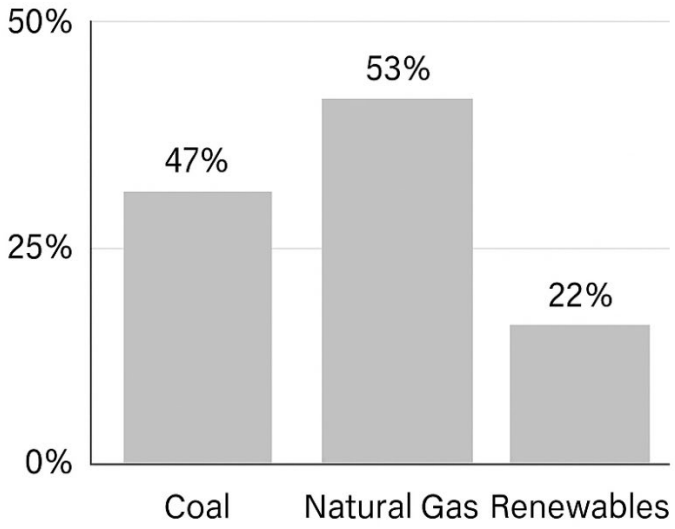
1.2.6 Malaysia: Market-Driven Transition with State Oversight

Malaysia's energy landscape has embraced a market-oriented approach highlighted by competitive auctions for large-scale solar projects and initiatives like the Net Energy Metering (NEM) program for residential rooftop solar installations. This strategy is encapsulated in the National Energy Transition Roadmap (NETR), which delineates the country's commitment to increasing the renewable energy portfolio. Despite these efforts, the state-owned utility, Tenaga Nasional Berhad (TNB), holds substantial control over electricity distribution and grid management, representing an ongoing tension between market liberalization and state oversight.

Current Energy Landscape

As of 2023, coal remains a significant component of Malaysia's energy mix, comprising approximately 47% of the electricity generation portfolio, while natural gas contributes around 53% (Sakti et al., 2023). Meanwhile, renewable energy, driven primarily by hydropower, biomass, and a growing solar segment, makes up about 22% of the energy mix (Nguyen, 2024). The government has initiated policies to scale up solar capacity significantly, launching tender rounds that have successfully attracted international investments.

Figure 2: Electricity Generation in Malaysia, 2023



Source: Sakti et al., 2023; Nguyen, 2024

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Policy Framework for Renewables

The Malaysian government's commitment to renewable energy is evident in several key policy initiatives:

- **Competitive Auctions for Solar**: The Large Scale Solar (LSS) projects enable developers to bid for contracts through competitive auctions, helping to determine the price per kilowatt-hour for solar power generation (Azhgaliyeva & Mishra, 2021).
- **Net Energy Metering (NEM)**: This program permits consumers with rooftop solar systems to feed excess energy back into the grid while receiving credits on their electricity bills (Wang et al., 2018).

Implementation Challenges

Despite the promising framework, several challenges impede a faster transition to renewable energy in Malaysia:

1. **Grid Modernization**: The existing grid infrastructure is often inadequate for handling the increasing influx of distributed energy resources. While efforts are underway to modernize the grid, significant investments and planning are still needed (Muhamad & Mustafa, 2024).
2. **Regulatory Clarity**: Ambiguities in regulatory frameworks can hinder private investment. Investors require clear, stable, and predictable policies to confidently engage in the renewable energy sector (Lim et al., 2021).
3. **State Utility Control**: The considerable influence of TNB over the electricity market creates challenges for new entrants and competition. Policymakers must navigate tensions between ensuring grid reliability and promoting market entry for renewable projects (Huang et al., 2019).

1.2.7 Vietnam: Rapid Growth with Policy Adjustments

Vietnam has distinguished itself as a regional leader in solar and wind energy development, primarily propelled by government incentives such as generous Feed-in Tariffs (FiTs) and increased private sector participation. The nation's energy transition ambition is encapsulated in the Power Development Plan VIII (PDP8), which targets 50% renewable energy by 2050. However, the country continues to grapple with grid congestion and uncertainties stemming from abrupt policy adjustments affecting the energy sector.

Current Energy Landscape

In 2023, the renewable energy share in Vietnam's energy mix reached approximately 25%, significantly attributable to the rapid growth in solar (18.5 GW installed) and wind power (4 GW) (Nepal et al., 2021). Despite this progress, coal still plays a dominant role, accounting for

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

approximately 48% of electricity generation, thereby reflecting a dual reliance on coal and burgeoning renewables (Sudaryanto, 2019).

Policy Framework for Renewables

Vietnam's policy environment has been pivotal for stimulating renewable energy growth:

- **Feed-in Tariffs (FiTs)**: These have incentivized solar and wind development, leading to significant increases in installed capacity (Sudaryanto, 2019).
- **Power Development Plan VIII (PDP8)**: The comprehensive roadmap aims to reduce reliance on coal in the long term while enhancing renewables (Øverland et al., 2021).

Implementation Challenges

However, challenges persist:

1. **Grid Congestion**: Rapidly deployed renewable energy installations have led to grid saturation issues, affecting the ability to integrate new solar and wind projects effectively (Nguyen, 2019).
2. **Policy Uncertainty**: The abrupt reduction in FiT rates in 2020 created investor hesitancy and a climate of uncertainty that has stalled numerous projects (Øverland et al., 2021).
3. **Dependence on Coal**: The existing energy strategy still heavily favors coal, delaying the longer-term transition to renewables as the government balances energy demands with economic considerations (Nguyen, 2019).

1.2.8 The Philippines: Decentralized and Private-Led Expansion

The Philippine energy sector employs a mix of policies, including FiTs, Renewable Portfolio Standards (RPS), and green energy auctions, to foster growth in renewable energy. As a nation endowed with geothermal and hydropower resources, these sources remain dominant; however, there has been notable growth in solar and wind energy.

Current Energy Landscape

By 2023, renewable energy accounted for approximately 29% of the Philippines' energy mix, with geothermal and hydropower leading the share. Recent years have witnessed heightened growth in solar and wind energy, propelled by governmental incentives and increased private participation (Ambarita & Kawai, 2018).

Policy Framework for Renewables

Key initiatives to promote renewable energy in the Philippines include:

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

- **Renewable Portfolio Standards (RPS)**: Mandating a specific share of energy from renewable sources ensures a minimum uptake of renewables in the energy mix (Irbah et al., 2025).
- **Green Energy Auctions**: These auctions facilitate the procurement of renewable energy and incentivize private sector investments (Yasmin et al., 2024).

Implementation Challenges

Despite a favorable policy environment, various obstacles hinder renewable energy deployment:

1. **Land-Use Conflicts**: Competition for land usage can create tension between renewable energy development and agricultural needs, complicating project implementation (Setiawan et al., 2025).
2. **Transmission Bottlenecks**: The underdeveloped transmission infrastructure limits the capacity to deliver renewable energy effectively to end users (Judijanto et al., 2024).
3. **Regulatory Reforms**: Recent amendments to the Renewable Energy Act allowing 100% foreign ownership aim to attract more investment, but uncertainties remain regarding enforcement and implementation of these policies (Ghazali et al., 2025).

In summary, while Malaysia, Vietnam, and the Philippines demonstrate significant advancements in their respective renewable energy sectors, each country faces distinct local challenges rooted in regulatory frameworks, grid infrastructure, and energy market dynamics.

Addressing these issues through targeted policy adjustments, investment in modernization, and fostering of private sector engagement will be critical for achieving their renewable energy targets and advancing regional energy security.

1.3 Political-Economic Drivers of Renewable Energy Policies

The disparate approaches to renewable energy (RE) policy across ASEAN cannot be understood without considering the complex interplay of political-economic drivers. This section delves into three primary factors contributing to policy variation: national interests and energy security, institutional structures and governance, and external partnerships and investment.

1.3.1 National Interests and Energy Security

National interests surrounding energy security play a pivotal role in shaping countries' renewable energy policies. Variations in resource endowments and geopolitical considerations dictate how each country prioritizes energy sources.

- **Indonesia and Vietnam**: Both nations rely heavily on their domestic coal and gas reserves, viewing these resources as essential to achieving energy independence and economic growth. Indonesia, as the world's largest thermal coal exporter, integrates its fossil fuel

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

resources into its energy strategy, reflecting a national interest in sustaining coal production and export revenue. Vietnam similarly prioritizes coal while promoting new renewable technologies as complementary to its energy mix, yet remains cautious about reducing its coal dependency too quickly.

- **Philippines and Malaysia**: In contrast, the Philippines and Malaysia emphasize diversifying their energy sources and enhancing self-sufficiency through greater reliance on renewables. For the Philippines, which has limited fossil fuel resources, the strategy focuses on reducing import dependence by increasing the share of renewable energy in the generation mix, aligning with national security interests. Malaysia sees renewable energy as a pathway to reduce reliance on imported fossil fuels and enhance energy diversification, thereby improving resilience against global energy price fluctuations.

This divergence reveals how energy security concerns shape national policies, as countries seek to balance their economic needs, resource availability, and geopolitical vulnerabilities.

1.3.2 Institutional Structures and Governance

The institutional frameworks governing national energy policies influence the flexibility of policy implementation and the extent of private sector participation.

- **Centralized Energy Planning**: Countries such as Vietnam and Indonesia operate under centralized energy planning models, with significant government control over the energy sector. In these settings, state-owned utilities (such as PLN in Indonesia and EVN in Vietnam) are dominant players in energy production and distribution. This structure enables the implementation of large-scale projects but often limits private sector involvement and slows responsiveness to market changes. Regulatory updates may take time as they require extensive bureaucratic processes, ultimately stifling innovation and adaptation to shifting market conditions.

- **Market-Driven Models**: Conversely, Malaysia and the Philippines adopt more market-oriented approaches which foster greater private sector engagement. The competitive auction systems and policies like the Feed-in Tariff (FiT) in these countries encourage private investments in renewable energy. The market-driven nature of their institutional frameworks enhances flexibility, allowing these nations to adapt rapidly to technological advancements and changing financial landscapes. However, they still face challenges related to regulatory coherence and grid capacity that can disrupt market operations.

The differing governance models significantly influence how effectively each nation can implement its renewable energy strategies and respond to external market dynamics.

1.3.3 External Partnerships and Investment

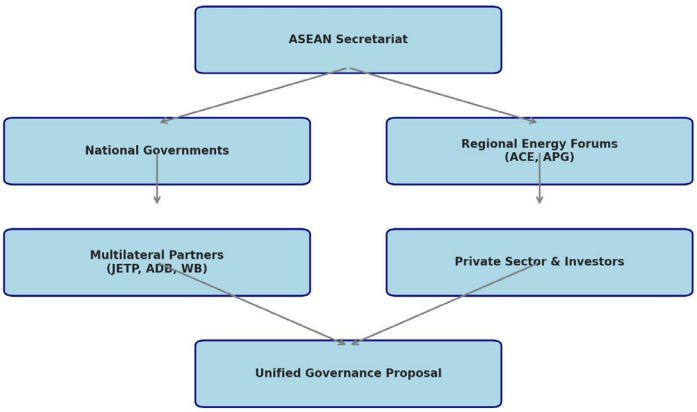
Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

The role of external partnerships and investment is crucial in financing renewable energy projects and facilitating technology transfer across the region.

- **Multilateral Initiatives**: Initiatives such as the Just Energy Transition Partnership (JETP) and the ASEAN Power Grid significantly contribute to collective efforts in sustainable energy development. JETP aims to accelerate the transition away from coal and facilitate investments in renewables, particularly in Indonesia and Vietnam, where coal dependency is high. The ASEAN Power Grid initiative promotes cross-border electricity trade, enhancing regional energy security and optimizing resource allocation among member states.
- **Foreign Direct Investment (FDI)**: Investments from countries such as China, Japan, and members of the European Union have accelerated the growth of renewable energy sectors in ASEAN. These investments often come with technology transfer agreements, enabling local firms to acquire new capabilities in solar, wind, and other renewable technologies. The influx of foreign capital is essential for financing infrastructure development and improving the commercial viability of new projects in countries like Vietnam and the Philippines, where local capital markets may be insufficient.

This interconnectedness highlights the importance of international collaboration in achieving regional sustainability goals. However, it also requires careful navigation of policy environments to maximize benefits from foreign investments while addressing any dependency concerns that may arise.

Figure 4. Evolving ASEAN Energy Governance Framework



Source: Developed by author based on ASEAN institutional relationships and JETP/ACE/APG structures.

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

CONCLUSION

In essence, the heterogeneity in renewable energy policy approaches across ASEAN stems from the complex interplay between domestic political priorities, institutional configurations, and the dynamics of transnational engagement. As Southeast Asia confronts intensifying challenges linked to climate vulnerability, energy insecurity, and developmental asymmetries, the imperative for integrated, politically attuned strategies becomes ever more critical. Embedding these political-economic determinants into regional energy planning is not only essential for advancing decarbonization trajectories, but also for ensuring the long-term resilience, equity, and coherence of the region's sustainable energy transition.

1.4 Conclusion and Policy Recommendations

Southeast Asia's renewable energy transition, though characterized by asymmetrical progress and national-level divergences, continues to advance amid mounting economic, environmental, and geopolitical pressures. The region's efforts reflect a mosaic of policy trajectories shaped by diverse developmental priorities, institutional capacities, and political economies. In this context, formulating a coherent regional governance architecture becomes not only desirable but necessary for achieving a just, secure, and sustainable energy future.

To that end, the following policy interventions are proposed:

1. **Regulatory Harmonization across Member States** ASEAN must prioritize the convergence of legal and regulatory frameworks to overcome existing fragmentation in energy governance. Establishing unified standards—pertaining to grid access, power purchase agreements, and permitting procedures—will facilitate transboundary renewable energy integration. Such alignment would reduce policy risk, stimulate intra-regional investment flows, and strengthen the enabling environment for cross-border infrastructure development (Taguibao, 2019; Araisya et al., 2023).
2. **Development of Regional Financing Mechanisms** Mobilizing capital at scale requires the institutionalization of dedicated regional financial instruments, such as green bonds, blended finance platforms, and credit enhancement facilities. These tools can lower the cost of capital, enhance bankability of renewable energy projects, and address persistent financing constraints. Multilateral development banks and national financial intermediaries should play a catalytic role in structuring risk-sharing frameworks that attract long-term private investment (Bertheau & Lindner, 2021).
3. **Institutionalized Public–Private Partnerships (PPPs)** Strategic engagement with private sector actors must be institutionalized through transparent and predictable frameworks that foster co-investment and technological innovation. PPPs can serve as crucial vehicles for scaling up project pipelines, accelerating technology transfer, and enhancing operational

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

efficiency in the deployment of renewables. Policy coherence and contractual stability are key enablers in this domain (Bertheau & Lindner, 2021).

4. **Empowerment of ASEAN Energy Institutions** Strengthening ASEAN's institutional apparatus—particularly the ASEAN Centre for Energy (ACE) and related coordination bodies—is essential for driving region-wide energy policy alignment. These entities should be mandated to oversee implementation, mediate policy coordination, and facilitate intergovernmental dialogue and knowledge transfer. Their enhanced capacity can anchor a more rules-based and outcome-oriented governance ecosystem (Azhgaliyeva & Mishra, 2021; Huang et al., 2019).

By systematically addressing these structural gaps, ASEAN can lay the groundwork for a resilient and integrated regional energy system. The realization of such a framework would not only accelerate the region's decarbonization trajectory but also reinforce economic interdependence, energy sovereignty, and environmental sustainability across Southeast Asia.

Discussion Questions

1. **How do domestic political structures influence renewable energy policy outcomes in Southeast Asia?** Domestic political structures significantly impact renewable energy policy outcomes due to the varying degrees of openness to private investment, regulatory changes, and implementation effectiveness. In centralized regimes, such as in Vietnam and Indonesia, state utilities dominate, resulting in slower responsiveness to market forces. In contrast, market-oriented systems, like those in Malaysia and the Philippines, promote private sector engagement, allowing for agility in policy adaptation and project execution.

2. **What are the key barriers to deeper regional energy cooperation under ASEAN?** Key barriers include regulatory fragmentation, which hinders seamless cross-border energy trade, financing gaps that limit investment in renewable projects, and political sovereignty concerns that create hesitations towards increased regional integration. National priorities often conflict with collective regional goals, complicating negotiations and consensus-building processes.

How can foreign investment be better leveraged to support renewable energy expansion in the region? Enhancing frameworks for foreign direct investment (FDI) by providing incentives, reducing regulatory burdens, and ensuring policy consistency can significantly improve the investment climate for renewable energy. Strengthening public-private partnerships and offering risk mitigation tools can further attract foreign capital, fostering technology transfer and local capacity building within the ASEAN renewable energy sector.

References

Ambarita, H., & Kawai, H. (2018). An overview of the feed-in tariff policy development in Indonesia. https://doi.org/10.2991/ebic-17.2018.24

Aritenang, A. (2017). The potential development effect of ASEAN connectivity: The case of Riau corridor. Mimbar Jurnal Sosial dan Pembangunan, 33(2), 339. https://doi.org/10.29313/mimbar.v33i2.2590

Azhgaliyeva, D., & Mishra, R. (2021). Feed-in tariffs for financing renewable energy in Southeast Asia. Wiley Interdisciplinary Reviews: Energy and Environment, 11(3). https://doi.org/10.1002/wene.425

Bertheau, P., & Lindner, R. (2021). Financing sustainable development? The role of foreign aid in Southeast Asia's energy transition. Sustainable Development, 30(1), 96–109. https://doi.org/10.1002/sd.2231

Chen, X., & Mauzerall, D. (2021). The expanding coal power fleet in Southeast Asia: Implications for future CO2 emissions and electricity generation. Earth's Future, 9(12). https://doi.org/10.1029/2021ef002257

Damu, D., Wong, B., Chai, J., Wong, C., Afrouzi, H., & Hassan, A. (2023). A review of renewable energy development in ASEAN, policies, environmental and economic impact. Fusus, 1(1), 13–22. https://doi.org/10.55670/fpll.fusus.1.1.2

Darmawan, A., Yuliawan, D., Aida, N., & Husain, F. (2024). Identifying the influence of foreign direct investment toward the ASEAN Economic Community 2025. KNE Social Sciences. https://doi.org/10.18502/kss.v9i14.16090

Ghazali, R., Messmer, A., Saïd, S., & Darwin, D. (2025). Potential and challenges of renewable energy management: Socio-economic perspective in Indonesia. Journal of Business Management and Economic Development, 3(2), 608–617. https://doi.org/10.59653/jbmed.v3i02.1545

Guild, J. (2019). Feed-in tariffs and the politics of renewable energy in Indonesia and the Philippines. Asia & the Pacific Policy Studies, 6(3), 417–431. https://doi.org/10.1002/app5.288

Huang, Y., Kittner, N., & Kammen, D. (2019). ASEAN grid flexibility: Preparedness for grid integration of renewable energy. Energy Policy, 128, 711–726. https://doi.org/10.1016/j.enpol.2019.01.025

Irbah, M., Slade, R., Howells, M., Fields, N., Plazas-Niño, F., & Richardson, E. (2025). Empowering Indonesia's energy transition planning through long-term energy system modelling: A technoeconomic dataset. https://doi.org/10.33774/coe-2025-vf910

Judijanto, L., Jayadi, H., Suryaningsih, N., & Imran, H. (2024). Evaluation of the effect of green energy policy on renewable power plant investment in Indonesia. WSNT, 2(4), 192–198. https://doi.org/10.58812/wsnt.v2i04.1535

Lim, G., Li, C., & Ji, X. (2021). Chinese financial statecraft in Southeast Asia: An analysis of China's infrastructure provision in Malaysia. The Pacific Review, 35(4), 647–675. https://doi.org/10.1080/09512748.2020.1868556

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Muhamad, M., & Mustafa, M. (2024). Temporal trends and scholarly impact: A quantitative analysis of bamboo biomass research in Southeast Asia. IOP Conference Series: Earth and Environmental Science, 1397(1), 012018. https://doi.org/10.1088/1755-1315/1397/1/012018

Nepal, R., Phoumin, H., & Khatri, A. (2021). Green technological development and deployment in the Association of Southeast Asian Economies (ASEAN)—At crossroads or roundabout? Sustainability, 13(2), 758. https://doi.org/10.3390/su13020758

Nguyen, A. (2019). Carbon dioxide emissions and implications for environmental policy: Evidence in Southeast Asia. Journal of Asian Energy Studies, 3(1), 8–24. https://doi.org/10.24112/jaes.030002

Nguyen, V. (2024). The impact of financial development on renewable energy consumption: The case of Vietnam and other ASEAN members. International Journal of Financial Studies, 12(2), 37. https://doi.org/10.3390/ijfs12020037

Paluseri, A., Kaihatu, T., & Christian, T. (2025). The benefits and challenges of solar photovoltaic (PV) business in Pertamina's gasoline station: Focused on energy transition, sustainability & green investment. Mix: Jurnal Ilmiah Manajemen, 15(1), 174. https://doi.org/10.22441/jurnal_mix.2025.v15i1.010

Sakti, A., Rohayani, P., Izzah, N., Toya, N., Hadi, P., Octavianti, T., ... & Wikantika, K. (2023). Spatial integration framework of solar, wind, and hydropower energy potential in Southeast Asia. Scientific Reports, 13(1). https://doi.org/10.1038/s41598-022-25570-y

Setiawan, A., Mentari, D., Hakam, D., & Saraswani, R. (2025). From climate risks to resilient energy systems: Addressing the implications of climate change on Indonesia's energy policy. Energies, 18(9), 2389. https://doi.org/10.3390/en18092389

Sudaryanto, A. (2019). The impact of natural gas demand on renewable energy development: A panel investigation of six Asian countries. Jurnal Ekonomi & Studi Pembangunan, 20(1). https://doi.org/10.18196/jesp.20.1.5015

Taguibao, J. (2019). Sustainable energy policy in Southeast Asia: Domestic variation and congruence in policy discourses. Asian Politics & Policy, 11(2), 327–346. https://doi.org/10.1111/aspp.12461

Wang, Y., Nian, V., Li, H., & Yuan, J. (2018). Life cycle analysis of integrated gasification combined cycle power generation in the context of Southeast Asia. Energies, 11(6), 1587. https://doi.org/10.3390/en11061587

Yasmin, S., Syah, F., Azka, M., & Aribowo, D. (2024). Energi surya sebagai solusi dalam peningkatan efisiensi energi perspektif SDGs 7 (Sustainable Development Goals 7) 2030. Venus, 2(2), 108–117. https://doi.org/10.61132/venus.v2i2.252

Yusoff, N., Aris, H., Nasiruddin, W., Rusli, A., Yurnaidi, Z., Safrina, R., ... & Rosalia, S. (2024). The driving forces behind renewable energy consumption: A comprehensive analysis of key determinants and environmental concerns in ASEAN countries. Environmental Science and Pollution Research, 31(35), 48388–48405. https://doi.org/10.1007/s11356-024-34358-8

Vol: 12, Issue: 4 August 2025 DOI: http://doi.org/10.5281/zenodo.17009630

Øverland, I., Sagbakken, H., Chan, H., Merdekawati, M., Suryadi, B., Utama, N., ... & Vakulchuk, R. (2021). The ASEAN climate and energy paradox. Energy and Climate Change, 2, 100019. https://doi.org/10.1016/j.egycc.2020.100019