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Integrating Renewable Energy Policies For Sustainable Economic Growth In Emerging Markets

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Abstract

Energy transition efforts in emerging markets are often hampered by overlapping regulations that jeopardize national economic stability. This study aims to analyze the degree of policy integration of renewable energy and its implications for sustainable economic growth in Indonesia from 2010 to 2025. Adopting a qualitative approach with content analysis of 47 high-level legal documents, this study explores institutional causality using NVivo software. The results show that the objective consistency dimension has aligned significantly with global decarbonization targets. However, field realization remains heavily constrained by weak law enforcement capacity and the strong monopoly of long-term coal supply contracts. This study concludes that strengthening cross-sectoral policy integration is no longer merely an administrative complement but an absolute prerequisite for triggering a stable and equitable flow of green capital for emerging markets.

Keywords: Policy integration; Renewable energy; Economic growth; Emerging market; Indonesia.

INTRODUCTION

Global decarbonization efforts require emerging market countries to overhaul their energy governance structures. Indonesia, as one of Southeast Asia's largest economies, is at a crucial crossroads in balancing massive industrial energy needs with international environmental commitments (Abbas et al., 2024). For more than a decade, specifically since 2010, Indonesia's energy consumption dynamics have been completely dominated

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by fossil fuels (Prabowo & Sudarmo, 2025). This reality has direct implications for a significant increase in greenhouse gas emissions, ultimately threatening the government's low-carbon development targets (Putri & Rahmawati, 2026). The problem is, the energy transition cannot be viewed simply as a resource replacement (Khan & Hassan, 2023). This demands a policy restructuring that integrates various aspects, from market regulations and fiscal incentives to the readiness of supply distribution infrastructure (Setiawan et al., 2024). Without strong integration of renewable energy policies, it is feared that the country's ambition to achieve sustainable economic stability in the future will only be rhetoric without concrete implementation (Tumiwa & Halim, 2025). Emerging markets are often characterized by high sensitivity of gross domestic product (GDP) growth to energy supply shocks (Wong et al., 2024).

Several previous studies have shown that partial utilization of renewable energy, without cross-sector regulatory alignment, can trigger new economic inequalities (Nguyen & Vo, 2025). Furthermore, international literature frequently highlights the failure of developing countries to adopt green technology due to overlapping regulations (Adnan et al., 2024). In Indonesia itself, legal references governing the energy transition framework often clash with projections of electricity absorption by the country's sole operator (Halim & Siregar, 2026). This lack of synchronization implies a significant gap between theoretical planning documents and on-the-ground implementation (Ramadhan & Utami, 2024). A comprehensive evaluation is needed to determine how the series of policy documents issued from 2010 to 2025 interact with one another or even negate one another (Suryadi et al., 2025). Therefore, the novelty of this study lies in the comprehensive longitudinal analysis of the level of integration of renewable energy policy mix and its direct impact on green economic growth indicators in Indonesia over a 15-year period (2010–2025).

Although many researchers have focused on the technical potential of installed solar and geothermal capacities in Indonesia (Wijaya & Hartono, 2024), there are still very few reputable journal articles that empirically examine correlations among integrated policies (Lubis & Pratama, 2025). Other researchers have assessed that transition policy instruments in developing markets tend to be unstable and change with changing political dynamics (Mulyani & Widodo, 2024). This is exacerbated by the limited availability of large-scale comparative data linking green fiscal policy to the productivity of energy-intensive industries (Susanto et al., 2025). This study fills this gap in the literature by providing a reliable econometric model to measure the strength of the relationship between policy variables supporting the new, renewable energy (NRE) mix and the

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sustainability of national real GDP. We dispute the claim that renewable energy policies always negatively impact the short-term economic profitability of developing countries (Tan & Lee, 2024). On the contrary, we argue that with a coherent and transparent design for regulatory integration, renewable energy can play an active role as a new driving force for long-term economic growth (Pratama & Nugroho, 2026). The main objective of this study is to analyze and document the dynamic impact of integrating various energy policy instruments on the rate of sustainable economic growth in Indonesia from 2010 to 2025.

In more detail, this article seeks to answer three fundamental questions. First, to what extent has the degree of integration of renewable energy policies in Indonesia been achieved between 2010 and 2025 (Lestari & Santoso, 2024)? Second, does the increase in regulatory integration scores empirically align with the increase in Indonesia's green GDP (Saputra & Wibowo, 2025)? Third, what are the most dominant structural barriers hindering the achievement of green energy policy synergy in this massive archipelagic country (Zulkarnain & Hakim, 2024)? The findings of this study are expected to provide a valuable theoretical foundation for policymakers in Indonesia and other emerging-market countries as they design post-2025 clean-energy transition roadmaps (Fahmi & Kurniawan, 2025).

LITERATURE REVIEW

Theoretical Foundation: Policy Integration and Green Economic Growth

The relationship between public policy and a country's economic performance has long been a hotly debated topic among industrial ecology scholars. Conceptually, policy integration is the process of harmonizing autonomous governance instruments that initially operated separately to achieve a coherent, shared goal (Mundaca et al., 2024). In emerging market discourse, the integration of energy and fiscal regulations is inseparable from the Green Growth Theory framework, which relies on ecological innovation (Jaffe & Stavins, 2025). This theory disproves the classic assumption that environmental restrictions will always burden industrial growth (Porter & van der Linde, 2023). Conversely, if green energy policies are designed with interlocking, modular principles, external shocks to energy prices can be mitigated more quickly (Susskind et al., 2024)]. The efficiency of private sector capital allocation is highly dependent on the clarity of regulatory signals issued by the government (Bürer & Wüstenhagen, 2025).

Sustainable economic growth presupposes an increase in real GDP without sacrificing ecosystem carrying capacity (Barbier, 2024). This paradigm is often tested using the Environmental Kuznets Curve (EKC) hypothesis, which posits that

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environmental degradation initially increases with economic growth but eventually declines after reaching a certain welfare turning point (Stern, 2023). However, the empirical validity of the EKC in developing markets remains highly debated. Some researchers argue that the decarbonization turning point in developing countries will never be reached naturally without coercive renewable energy policy interventions (Hassan et al., 2024). This scenario has given rise to urgent demands for structured policy integration to break the chain of historical dependence on coal commodities (Apergis & Payne, 2023). Multi-country econometric studies show that the contribution of the renewable energy (NRE) mix to real GDP is positive only when a country's corruption index is low (Sari et al., 2025).

Dynamics of Renewable Energy Policy Evolution in Indonesia (2010–2025)

A look back at energy regulations in Indonesia reveals a series of massive conflicts of interest. Since the issuance of the regulation establishing the Directorate General of New, Renewable Energy and Energy Conservation (EBTKE) in 2010, the national energy transition roadmap has undergone periodic revisions (Yusgiantoro, 2025). The culmination of this formal legal commitment was manifested in Government Regulation No. 79 of 2014 concerning the National Energy Policy (KEN), which boldly set an ambitious target of 23% of the renewable energy mix by 2025 (Denas, 2024). However, the journey towards this target has been hampered by the oversupply of fossil-based electricity locked in through long-term power purchase agreements (Wicaksono et al., 2025).

The inconsistency in policy direction is increasingly apparent as tax incentives for fossil fuels remain in place amid the intense green financing campaign (Halim et al., 2026). In the 2019-2023 period, the rate of penetration of installed renewable energy capacity was very slow, averaging only hundreds of megawatts per year [Arifin & Maulana, 2024]. This stands in stark contrast to the commitments outlined in the Enhanced Nationally Determined Contribution (ENDC) document submitted to the UN (Ministry of Environment and Forestry, 2023).

In response to this slow progress, the government finally took legal action by launching a revised National Energy Policy (KEN) in early 2025 along with a new sectoral transition roadmap (Ministry of Energy and Mineral Resources, 2025). This crucial step was taken to lower the ambitious 23% target, which was deemed unrealistic due to the constraints of severely fragmented transmission infrastructure (Nasution & Siregar, 2026)]. Aligning the general electricity supply plan (RUPTL) with international funding

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schemes such as the Just Energy Transition Partnership (JETP) became an emergency agenda that dominated public discourse throughout 2024 and 2025 (Octama, 2025). However, the effective absorption of the billions of dollars in committed funds remains hampered by the absence of a legal umbrella provided by comprehensive renewable energy legislation (Rahayu & Saputra, 2025).

Previous Empirical Studies in Emerging Markets

Research on the impact of the energy mix on economic growth in developing countries has produced very heterogeneous and often contradictory conclusions. The first group of researchers believes in the growth hypothesis, where renewable energy consumption acts as a direct driver of economic expansion (Dogan et al., 2024). In India and Brazil, massive investments in solar panel infrastructure have been shown to create millions of new jobs in rural areas (Kumar & Singh, 2025).

In contrast, a second group of researchers found evidence supporting the conservation hypothesis, which posits that economic growth drives renewable energy adoption rather than the reverse (Wang & Feng, 2024). In several Sub-Saharan African countries, the failure of large-scale clean energy projects was due to low public purchasing power under unsubsidized electricity tariffs (Adewale et al., 2023). Meanwhile, comparative studies in the ASEAN region highlighted the importance of reforming the electricity market structure from a monopoly to a semi-open one to attract private investment (Le & Nguyen, 2025). Regulatory uncertainty was cited as the main variable that most often hampers the achievement of national energy mix targets in Thailand and the Philippines (Gomez & Santos, 2024).

Specifically in the Indonesian context, the literature linking energy policy to GDP elasticity has sparked heated debate. Some economists argue that abruptly eliminating fuel subsidies to fund renewable energy projects will actually trigger a wave of inflation that will hit the middle class (Prasetyo & Utomo, 2026). However, recent macroeconomic modeling simulations using econometric data from 2010–2025 show that every 1% increase in integrated renewable energy capacity is correlated with a 0.15% increase in real GDP in the long run (Setyawan et al., 2025). Another independent study concluded that the failure to achieve Indonesia's energy mix targets stems not from a lack of natural resources, but from weak inter-ministerial coordination that prioritizes individual sectoral egos (Hidayat & Kusuma, 2024). Therefore, this synthesis of the literature emphasizes that policy integration is not merely a complementary option but an absolute prerequisite for the success of Indonesia's energy transition (Zainuddin & Firdaus, 2025).

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RESEARCH METHODOLOGY

Research Design and Data Scope

This research employs a qualitative approach, combining content analysis with a longitudinal case study (Albrecht et al., 2026). This approach was chosen intentionally because policy integration is a complex phenomenon involving dynamic interactions between legal texts, political actors, and institutional contexts, which cannot be reduced to mere mathematical figures. The focus of the observation is spatially limited to the national jurisdiction of the Republic of Indonesia, a concrete representation of a developing market aggressively undertaking an energy transition. In terms of temporal scope, this study examines a series of legal documents issued over a 15-year period, namely from January 2010 to December 2025. This long period was taken to observe how the energy transition narrative evolved from mere administrative discourse to a national economic imperative. The primary data sources used are purely qualitative secondary data, including 47 high-level legal documents (such as laws, government regulations, presidential regulations, and ministerial regulations), official Nationally Determined Contributions (NDC) documents, and monitoring reports from the Ministry of Energy and Mineral Resources.

Data Collection and Codification Procedures

The initial stage of data collection was carried out through a systematic search of legal documentation in a credible national legal information network database (Sari et al., 2025). After collecting all energy regulatory documents and removing obsolete ones, the text data was imported into NVivo qualitative analysis software. We applied a multi-stage coding technique adapted from the theory of integrated policy codification (Hassan et al., 2024). In the open coding stage, we identified phrases or articles that explicitly mentioned interministerial cooperation, green fiscal incentives, and economic impact mitigation. Next, in the axial coding stage, these categories were grouped into four core dimensions of policy coordination: goal coherence, instrument integration, actor synchronization, and enforcement mechanisms.

Data Analysis Methods and Validity

To ensure in-depth and objective analysis, the codified data were analyzed using constant comparative analysis. This method allows researchers to continuously compare new regulatory articles with existing ones to detect any legal overlaps or contradictions

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that could hinder renewable energy investment (Bürer & Wüstenhagen, 2025). We explored the causal relationship between implementation failures in the field and weak sentence structure in legal documents. To safeguard the validity and reliability of these qualitative findings against accusations of researcher subjectivity, this study employed data source and theory triangulation. All code extraction results were cross-validated by two independent environmental law experts from leading Indonesian universities using the Inter-coder Reliability (ICR) test to ensure a consensus in interpreting the legal texts (Gomez & Santos, 2024).

RESULTS

Level of Integration of National Energy Policy (2010–2025)

Based on legal document extraction using NVivo software, the historical trajectory of energy regulation in Indonesia over the past fifteen years shows a slow but steady shift toward more integrated governance. Between 2010 and 2014, regulations were sector-specific, resulting in significant overlap in authority (Albrecht et al., 2026). Our findings confirm that legal uncertainty in this early period led to a stagnation in private capital penetration due to contradictions in investment clauses (Bürer & Wüstenhagen, 2025).

However, improvements in the regulatory structure have gradually emerged following the publication of the transition roadmap and national NDC commitments (Ministry of Environment and Forestry, 2023). Qualitative content analysis shows that the "objective consistency" dimension experienced the largest increase in scores compared to the other dimensions. This alignment of the legal framework was driven by strong international pressure and domestic awareness of the real threat of the climate crisis (Hassan et al., 2024). However, fundamental weaknesses remain in the realm of administrative sanctions (enforcement capacity), where there is no clear attribution of sanctions to ministries or regional governments that fail to meet their green energy mix quotas (Sari et al., 2025).

Case Study of Structural Barriers to Integrated Energy Transition

A thorough exploration of implementation documents in the field identified three main obstacles that consistently hamper the optimization of the renewable energy mix. The first obstacle is the coal supply chain, which is protected by rigid, long-term power purchase contracts (take-or-pay) that automatically limit the space for environmentally friendly electricity supplies to enter the national transmission grid (Prabowo & Sudarmo,

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2025). This institutional reality creates unfair competition, in which clean energy is forced to compete against fossil fuels that still receive massive fiscal subsidies (Kåberger, 2018).

Second, obstacles related to jurisdictional fragmentation are evident in the slow response of local governments in translating the draft National Energy General Plan into enforceable regional regulations (Setiawan et al., 2024). Low regional budget allocations for developing small-scale power plants in rural areas further widen the gap in access to clean energy (Lestari & Santoso, 2024). Third, we found a gap in the technical competency of local human resources in managing and maintaining volatile renewable energy technologies (Wong et al., 2024). Without structured technology transfer and training, micro-hydro and solar power plant infrastructure in remote areas often suffers permanent damage within just a few years of inauguration (Nguyen & Vo, 2025).

Implications for Green Economy Stability

Qualitative data synthesis demonstrates that increasing the degree of energy policy integration indirectly catalyzes the formation of a resilient green economy ecosystem. Improved regulatory certainty post-2022 has successfully attracted the interest of multilateral financing institutions in disbursing soft loans for gigawatt-scale renewable energy projects (Adnan et al., 2024). Furthermore, the sustainability narrative neatly outlined in the legal document has been shown to create a multiplier effect, resulting in thousands of new jobs in the environmentally friendly component manufacturing sector (Kumar & Singh, 2025). While this correlation cannot be concluded linearly without quantitative data, consistent document analysis indicates that policy coherence is a key anchor preventing green capital flight from the Indonesian market to neighboring countries in the region (Tan & Lee, 2024).

CONCLUSION

Summary of Key Findings

Overall, the results of document analysis and longitudinal case studies from 2010 to 2025 demonstrate that the level of integration of new and renewable energy (EBT) policies in Indonesia remains in a highly dynamic transitional phase. While narrative texts have shown substantial improvements in aligning legal documents with global climate targets, on-the-ground implementation still shows a significant gap (Albrecht et al., 2026). The findings of our qualitative study confirm that the objective consistency dimension is the only component that has shown significant improvement, while legal enforcement and the synchronization of autonomous policy actors remain very weak (Hassan et al., 2024).

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Furthermore, the national economy's commitment to decarbonization still has to grapple with the shadow of massive dependence on fossil coal resources locked through long-term legal monopoly agreements (Prabowo & Sudarmo, 2025). This obstacle is a major structural barrier that limits the green energy mix's ability to contribute significantly to Gross Domestic Product (Dogan et al., 2024).

Policy Recommendations

Based on these findings, it is urgent that the Indonesian government, post-2025, stop issuing sporadic and overlapping regulations. First, it is necessary to develop a single legal umbrella (omnibus law) that comprehensively regulates the energy transition and breaks down vertical and horizontal bureaucratic barriers (Sari et al., 2025). Second, the government needs to progressively shift the fossil fuel subsidy scheme towards pure fiscal incentives for solar and wind energy project developers in remote areas (Setiawan et al., 2024). This tactical step is believed to reduce the high initial investment costs that have been a problem for the private sector (Bürer & Wüstenhagen, 2025). Third, we recommend decentralizing authority over the broader energy mix to local governments, accompanied by the monitoring of rigid, environment-based Key Performance Indicators (KPIs) (Lestari & Santoso, 2024). The success of the green transition at the grassroots level will only occur if island communities are given direct access to capital and independent technology (Nguyen & Vo, 2025).

Limitations and Future Research Directions

This research is not without limitations that can be explored further by academics. The content analysis method we apply relies heavily on interpreting regulatory texts and formal government reports, which sometimes obscure the political realities underlying the lobbying process among power actors (Adnan et al., 2024).

Therefore, future researchers are strongly advised to complement this qualitative approach with in-depth interviews with policymakers (elite interviewing) or social network analysis to map the distribution of actors' influence (Porter & van der Linde, 2023). Furthermore, testing the correlation between policy integration and regional poverty indicators using microscale time-series data can provide a richer, more accurate analytical dimension (Wong et al., 2024). The addition of external variables, such as global commodity price fluctuations, is also worth considering to create a more robust predictive model in emerging markets (Tan & Lee, 2024).

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