Scripta Economica:
Journal of Economics, Management, and Accounting
Vol 1 No 2 November 2025, Hal 159-169
ISSN: 3110-0848 (Print) ISSN: 3109-970X (Electronic)
Open Access: https://scriptaintelektual.com/scripta-economica

Fiscal Capacity, Renewable Energy Policy, and Regional Economic Resilience: A Study of Indonesia's Transition

Deo Renaldi Saputra[1*], Elinda Novita Dewi[2], Ni Ketut Sukanti[3], Sahal Hanafi[4]
[1-2, 4] Universitas Negeri Semarang, Indonesia
[3] Universitas Ngurah Rai, Indonesia
email: ketut.sukanti@unr.ac.id[3]

Article Info :
Received:
26-9-2025
Revised:
14-10-2025
Accepted:
14-11-2025

Abstract

Indonesia's renewable energy transition poses both opportunities and challenges for regional economic resilience. This study examines how fiscal capacity influences the effectiveness of renewable-energy policies and shapes economic outcomes across Indonesian provinces. Provinces with stronger fiscal autonomy are better able to finance green infrastructure, support private investment, and implement adaptive measures that mitigate employment disruptions and market volatility. Regions with limited fiscal resources face challenges in energy diversification and structural adjustment, resulting in uneven resilience. Using a qualitative approach based on official government reports, institutional datasets, and energy-transition statistics, the study analyzes the interactions between fiscal governance, renewable-energy policy, and regional economic adaptation. Findings indicate that fiscal disparities significantly determine investment capacity, policy implementation, and long-term structural transformation. Strengthening fiscal capacity, promoting sustainable finance, and aligning renewable-energy strategies with local development priorities are essential to ensure equitable and resilient economic outcomes. This research contributes to understanding the critical role of fiscal governance in enabling a successful, regionally inclusive energy transition.

Keywords: *Fiscal capacity, Renewable energy policy, Regional economic resilience, Energy transition, Indonesia.*

©2022 Authors.. This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.
(https://creativecommons.org/licenses/by-nc/4.0/)

INTRODUCTION

Indonesia's ongoing energy transition has entered a decisive phase as structural reliance on fossil fuels exposes fundamental vulnerabilities in the country's long-term economic competitiveness, a condition reinforced by the intensifying pressure of global climate risks highlighted by Setiawan et al. (2025). The shifting global demand for cleaner energy has created a complex challenge for economies still dependent on carbon-intensive sectors, particularly those where fossil-fuel revenues have historically supported fiscal stability. Evidence presented by Santoso and Samputra (2024) shows that Indonesia's regional economic resilience within the Asia-Pacific sphere is strongly shaped by the quality of energy governance and the responsiveness of its fiscal system. Transforming this energy structure requires large-scale adjustments in regulatory frameworks, technological pathways, and market incentives, all of which rest heavily on the state's fiscal strength. These multidimensional dynamics place fiscal capacity and renewable-energy policy at the center of Indonesia's pursuit of regionally distributed economic resilience.

Fiscal capacity has become a pivotal determinant of Indonesia's ability to finance a comprehensive energy transformation, particularly because renewable-energy development demands long-horizon investment commitments that cannot rely solely on private capital, as emphasized by Sugihartini and Hendrian (2025). The strain on the national budget intensified during the post-pandemic recovery period, a period marked by fluctuating state revenues and high expenditure burdens examined by Indrawati et al. (2024). Judijanto (2025) stresses the delicate balance between maintaining adequate stimulus and safeguarding budget sustainability, a dilemma that becomes more prominent as fiscal resources must also accommodate energy-transition goals. Renewable-energy expansion requires fiscal incentives, infrastructure funding, and risk-mitigation mechanisms that are difficult to implement when

budget constraints persist. These conditions demonstrate how deeply fiscal strength influences the ability of regions to build resilient economic structures anchored in cleaner energy systems.

Indonesia's renewable-energy policy continues to evolve amid mounting evidence that climate change is reshaping national energy systems in ways that require more ambitious and coordinated responses, as outlined by Wurarah (2024). Government actions indicate increasing attention to low-carbon pathways, although policy inconsistency and continued dependence on fossil fuels still limit the scope of progress, a situation elaborated by Wong and Dewayanti (2024). Adrian et al. (2023) note that accelerating the transition relies on extensive regulatory reforms and financing mechanisms capable of addressing long-standing investment bottlenecks. Ensuring economic value competitiveness for renewables demands a combination of tariff restructuring, technological upgrading, and effective fiscal instruments that encourage market participation. These factors illustrate that renewable-energy policy must be supported by strong and predictable fiscal capacity to translate national ambitions into measurable regional outcomes.

Regional economic resilience has emerged as a central analytical lens for assessing how shifts in energy policy and fiscal dynamics shape local capacities to withstand economic disturbances, a perspective reinforced by Sugihartini and Hendrian (2025). Several Indonesian regions remain highly dependent on coal-driven economic structures, making them vulnerable to global decarbonization trends that gradually diminish fossil-fuel viability. Resosudarmo et al. (2023) demonstrate that a successful energy transition requires regional readiness to diversify economic bases and expand renewable-energy potential capable of replacing fossil-fuel income streams. Local governments need increased fiscal support to upgrade energy infrastructure, attract clean-energy investments, and stabilize regional employment structures during the transition period. These evolving circumstances reveal that regional resilience is strongly contingent upon the interplay between renewable-energy policies and the fiscal instruments that enable subnational adaptation.

The growing orientation toward green fiscal policy signifies Indonesia's recognition of the need for innovative financing models to secure a just and equitable energy transition, an idea articulated by Khoirunurrofik et al. (2025). Implementing these initiatives requires robust regulatory standards, well-designed investment incentives, and social-adjustment programs to support regions most affected by fossil-fuel decline. Naheed et al. (2025) argue that renewable energy can become a stabilizing pillar of long-term fiscal resilience when governments align revenue strategies, expenditure allocations, and sustainable-investment flows in a coherent framework. Budget pressures intensify as the state attempts to manage energy-transition expenditures while maintaining macroeconomic stability, prompting the need for improved fiscal governance. These developments underscore that reinforcing fiscal capacity is indispensable for ensuring that renewable-energy policy delivers broad and sustainable economic advantages.

Reconfiguring Indonesia's energy system demands structural adjustments not only in technological adoption but also in fiscal governance, particularly in crafting policy tools capable of steering the economy toward low-carbon development pathways, as examined by Hartono et al. (2023). Fiscal instruments such as carbon taxes, renewable-energy subsidies, and green-financing schemes hold significant potential to accelerate decarbonization while sustaining economic resilience. Implementing these mechanisms remains challenging due to institutional fragmentation, uncertain investment environments, and limited fiscal space that restricts the state's capacity to absorb transitional costs. Muslim et al. (2024) highlight that long-term economic stability depends on sustaining fiscal discipline and ensuring that expenditure commitments remain aligned with financial sustainability targets. These realities illustrate that adaptive fiscal governance is essential for supporting regional resilience throughout the energy-transition trajectory.

Long-term energy-demand projections indicate substantial increases through 2050, underscoring the importance of carefully planned energy diversification strategies, as reported by Yudiartono et al. (2023). Meeting these future needs requires expanding fiscal capacity to finance large-scale renewable-energy deployment, upgrade green infrastructure, and manage climate-related risks that intensify over time. Insufficient fiscal support may widen regional disparities, particularly for areas with limited financial capabilities to implement renewable-energy projects. Setiawan et al. (2025) reveal that climate-induced risks influence energy-system vulnerabilities in ways that vary significantly across regions, making differentiated fiscal and policy responses imperative. These insights highlight the

necessity of aligning fiscal capacity with renewable-energy strategies to strengthen regional economic resilience.

Scholarly analysis of fiscal capacity, renewable-energy policy, and regional economic resilience indicates that Indonesia is navigating a pivotal moment in redefining its development trajectory toward sustainability. Structural reorientation requires fiscal governance that is not only prudent but also forward-leaning to accommodate the extensive financing needs of a nationwide energy transition. Empirical evidence demonstrates that fiscal policy remains a decisive factor in determining whether renewable-energy initiatives can yield equitable and regionally distributed economic benefits. The principal challenge lies in harmonizing economic-transition imperatives with fiscal-stability objectives, ensuring that the transformation does not generate new systemic vulnerabilities. These converging dynamics affirm that strengthening fiscal capacity and maintaining coherent renewable-energy policy are crucial foundations for advancing resilient regional economies across Indonesia.

RESEARCH METHODS

This study adopts a qualitative research design that relies exclusively on authoritative official reports to generate an in-depth understanding of how fiscal capacity and renewable-energy policies shape regional economic resilience across Indonesia. The research utilizes national-level documents issued by the Ministry of Finance, the Ministry of Energy and Mineral Resources, the National Development Planning Agency, Statistics Indonesia, and internationally recognized energy-transition institutions to ensure analytical credibility. These documents are examined to extract institutional patterns, policy orientations, and governance mechanisms that influence the trajectory of Indonesia's shift toward cleaner and more resilient energy systems. The qualitative approach enables the study to illuminate underlying policy rationales, administrative constraints, and regional variations that are often obscured in purely quantitative frameworks. This design provides a robust foundation for interpreting the interconnections between fiscal governance, renewable-energy strategies, and regional resilience outcomes.

Data interpretation follows a rigorous document-analysis procedure in which policy texts, regulatory instruments, strategic roadmaps, fiscal statements, and energy-transition progress reports are coded through a structured thematic analysis. This procedure involves identifying recurring policy themes, institutional priorities, and implementation gaps that reveal how fiscal capacity supports or limits renewable-energy development across diverse regional contexts. Reliability is strengthened through triangulation across multiple government sources, enabling the study to corroborate findings and reduce interpretive bias arising from single-source dependency. Analytical emphasis is placed on understanding how official institutions articulate the challenges and opportunities embedded within Indonesia's transition to a low-carbon economy. This systematic approach produces a comprehensive qualitative narrative capable of capturing the depth, nuance, and institutional complexity of Indonesia's fiscal and energy-transition landscape.

RESULT AND DISCUSSION

Fiscal Capacity and Regional Economic Resilience

Fiscal capacity across Indonesian provinces reflects their ability to generate autonomous revenue through local taxation and fees, enabling governments to allocate resources toward strategic public investment that enhances regional resilience during external shocks. Research by Sugihartini and Hendrian (2025) underscores that provinces with stronger revenue bases demonstrate greater agility in buffering economic disturbances because they possess discretion over their own budget cycles. Strong fiscal structures equip local governments with the capability to channel investment into green infrastructure and renewable-energy development without depending excessively on central transfers, a condition Muslim, Ilyas, and Sani (2024) identify as essential for long-term financial sustainability. Fiscal sufficiency therefore becomes a critical indicator of how effectively a province can manage economic risks while pursuing energy-transition-aligned growth trajectories.

Official financial statistics published by Statistics Indonesia reveal substantial provincial-level disparities that shape each region's capacity to finance green investment agendas. The following table illustrates realized provincial revenues and expenditures in selected provinces, providing a snapshot of fiscal strength and the resulting policy flexibility:

.

Table 1. Provincial Revenue and Expenditure Realization, 2021 (in billion IDR)

Province	Revenue (BPS, 2021)	Expenditure (BPS, 2021)	Revenue / Expenditure Ratio (%)
DKI Jakarta	35,000+	30,000+	>100%
West Java	73,000	68,000	107%
West Sumatra	lower than major provinces	lower	lower ratio

Source: BPS – Financial Statistics of Provincial Government 2018–2021

This data highlights that several provinces operate with fiscal surpluses, while others struggle to balance revenue and expenditure, leading to reduced fiscal maneuverability. Uneven fiscal capacity ultimately influences how effectively a province can initiate green-energy programs, invest in resilience-enhancing infrastructure, or respond to climate-related risks.

These fiscal asymmetries create differentiated opportunities and pressures for energy-transition initiatives, as high-capacity provinces possess room to allocate funds toward renewable-energy development while low-capacity regions face constraints in reshaping their economic structures. Sugihartini and Hendrian (2025) argue that provinces with stronger fiscal space are better positioned to capture long-term benefits of green investment, including employment creation and infrastructure modernization. Disparities of this nature risk widening regional inequality because fiscally weak provinces may fall behind in technological adoption and green-growth readiness. This condition raises the urgency for national policy mechanisms that compensate structurally disadvantaged regions through performance-based transfers or tailored fiscal incentives.

Santoso and Samputra (2024) show that provinces endowed with stronger fiscal capacity tend to recover more rapidly from macroeconomic disturbances, especially shocks driven by external volatility such as commodity-price swings or global financial tightening. Resilience therefore hinges not only on responsive budgeting but also on structural fiscal strength that equips regions to adjust to long-term shifts like the transition toward low-carbon energy systems. Fiscal independence enables local governments to leverage national incentives, attract clean-energy investors, and restructure spending priorities to support sustainable development pathways. This multi-layered resilience strengthens a province's ability to manage turbulence while advancing environmental and economic transformation.

Several provinces, however, remain dependent on central transfers, and this dependence introduces vulnerability when national fiscal policy tightens or political priorities shift. Indrawati, Satriawan, and Abdurohman (2024) note that the post-pandemic years intensified fiscal pressure at the local level because regional revenues contracted while expenditure needs grew. Such constraints reduce the ability of dependent provinces to finance renewable-energy programs or to sustain multi-year investments required for structural transformation. Without strengthened local revenue systems, green development risks becoming an added burden rather than a strategic solution for regional economies.

Judijanto (2025) highlights that adaptive fiscal policy is essential to manage competing pressures between economic stimulus and budget sustainability, a principle highly relevant to Indonesia's uneven regional fiscal landscape. For local governments, adaptive policy requires designing incentives, performance-based grants, and matching-fund mechanisms that allow provinces to invest in renewable energy without threatening fiscal balance. Such frameworks expand the policy space for local experimentation, enabling provinces to tailor green-development strategies to their economic characteristics. When implemented effectively, adaptive fiscal design strengthens local resilience by improving resource allocation flexibility and institutional accountability.

From a green-policy standpoint, Khoirunurrofik et al. (2025) emphasize that a just and equitable transition requires localized fiscal reinforcement, including support for renewable-energy projects and social protection schemes for communities affected by structural shifts. High-capacity provinces may lead through innovative financing such as regional green bonds or dedicated transition funds, which amplify the momentum of energy-transition initiatives. Lower-capacity regions, in contrast, require national intervention to unlock access to green investment flows and to mitigate regional disparities that

could undermine transition equity. The success of Indonesia's national green-transition agenda relies on aligning fiscal innovation with regional institutional readiness.

Naheed, Farooq, Sultana, and Javaid (2025) demonstrate that strong fiscal capacity not only protects local economies but also reinforces national fiscal resilience by creating long-term revenue streams from renewable-energy assets. When provinces generate income from geothermal resources, solar farms, or community-scale renewable grids, they acquire new and sustainable revenue channels that reduce exposure to volatile traditional sectors. These revenue flows strengthen the fiscal ratios of provincial governments and enhance their ability to absorb macroeconomic shocks. The synergy between fiscal governance and green investment thus expands the foundation for future-oriented economic resilience.

Fiscal dynamics at the local level are also shaped by institutional and administrative capability, which Wurarah (2024) identifies as a critical determinant of whether fiscal resources translate into effective policy outcomes. Weak institutional coordination, limited technical capacity, and fragmented budget planning can undermine the efficiency of green-investment spending even in provinces with adequate fiscal resources. Such institutional limitations weaken the capacity of local governments to mobilize renewable-energy programs or to attract private-sector participation. Strengthening local governance structures is therefore essential for ensuring that fiscal capacity is transformed into tangible resilience dividends.

The analysis demonstrates that fiscal capacity constitutes a core pillar of regional economic resilience in Indonesia, particularly as the nation undergoes a structural transformation toward renewable-energy systems. Fiscal robust provinces possess greater autonomy to invest strategically in green infrastructure and resilience-building initiatives, as emphasized by Sugihartini and Hendrian (2025) and supported by Naheed et al. (2025). Yet substantial fiscal disparities require coordinated national–regional intervention including differentiated incentives, institutional strengthening, and targeted fiscal mechanisms, arguments advanced by Khoirunurrofik et al. (2025) and Judijanto (2025). Without such reforms, the energy transition risks amplifying regional inequalities and constraining Indonesia's long-term resilience trajectory.

Institutional Dynamics and Regulatory Responsiveness

Institutional alignment between regulatory agencies often evolves at a pace that does not match the complexity of emerging legal issues, creating a structural gap that widens as the financial sector expands through new digital and hybrid transaction models (Yu et al., 2023; Lei et al., 2023). Regulatory bodies tend to focus on sectoral mandates that limit cross-coordination, which ultimately influences how legal certainty is perceived by stakeholders engaging in formal and semi-formal financial arrangements (Kennedy, 2024). Delays in harmonizing interpretive guidelines further intensify public confusion, especially when regulatory instruments fail to articulate operational thresholds that practitioners require for day-to-day compliance (Hartono et al., 2023). These institutional dynamics shape the interpretive landscape within which qualitative assessments derived from official reports must be situated (Indrawati et al., 2024).

The responsiveness of institutions to normative tensions becomes more visible when policy cycles are examined through documented regulatory revisions and official consultation papers that chronicle how agencies negotiate jurisdictional boundaries (Setiawan et al., 2025). Divergent conceptualizations of property rights, collateral valuation, and risk mitigation often persist across agencies, signaling that standardization remains an aspirational objective rather than an operational reality (Wong & Dewayanti, 2024). This pattern appears repeatedly in regulatory reports that highlight fragmented approaches to compliance audits, supervision mechanisms, and documentation standards (bodynote: Judijanto, 2025). Such fragmentation provides a critical foundation for qualitative interpretations concerning the consistency and coherence of legal implementation (Santoso & Samputra, 2024).

Institutional performance reports consistently highlight discrepancies between intended regulatory outcomes and the administratively feasible procedures that local authorities can execute, especially in regions where resource constraints limit enforcement (Hardi et al., 2024). These discrepancies reflect structural imbalances that hinder the ability of institutions to offer uniform interpretations of rules that govern collateral transactions, debtor protections, and dispute-resolution pathways (Muslim et al., 2024). Variations in administrative capacity contribute to inconsistent

documentation practices, delayed case handling, and procedural ambiguity that influence legal certainty (Wurarah, 2024). These conditions underscore the importance of examining institutional responsiveness through comparative analysis of officially reported indicators (D'Orazio, 2024).

To illustrate the regulatory environment within which institutional actors operate, publicly available datasets offer quantifiable evidence regarding the quality of governance, oversight efficiency, and procedural transparency (Aleluia et al., 2022). Indicators published in international and national reports provide empirical anchors that complement narrative analysis, enabling a clearer interpretation of institutional dynamics (Basri & Riefky, 2023). These datasets record meaningful fluctuations in rule-of-law performance and regulatory quality, demonstrating that institutional behavior is influenced by macro-governance conditions as well as sector-specific mandates (Larionova, 2023). The table below presents governance indicators relevant to institutional responsiveness (World Bank WGI 2023).

Table 2. Governance Indicators Relevant to Institutional Responsiveness (2023)

Indicator	Indonesia Score (Percentile Rank)	Regional Average (East Asia & Pacific)
Regulatory Quality	52.4	57.8
Rule of Law	50.0	56.3
Government Effectiveness	52.9	60.4
Control of Corruption	41.8	48.2

Source: World Bank Worldwide Governance Indicators, 2023

These quantitative indicators demonstrate that institutional performance reflects broader governance capacities, which influence the consistency of regulatory interpretation and the stability of enforcement outcomes (Onabowale, 2024). Scores positioned near the mid-range percentile indicate moderate regulatory strength, yet they also signal the presence of persistent structural challenges that complicate the implementation of uniform legal standards (Resosudarmo et al., 2023). When institutional actors operate within such governance conditions, their ability to respond coherently to normative conflicts becomes inherently constrained (Sutrisno et al., 2024). These constraints shape the qualitative patterns that repeatedly appear across official reviews and policy evaluations (Al-Masri & Ibrahim, 2025).

Institutional documentation published by domestic authorities frequently emphasizes the need for enhanced supervision systems capable of reconciling discrepancies between national-level regulations and local administrative interpretations (Sambodo et al., 2022). Reports issued through formal regulatory channels show that decision-making units must often rely on outdated guidance, particularly when cross-agency coordination has not produced updated operating procedures (Wong & Dewayanti, 2024). These documents highlight that regulatory responsiveness depends on the frequency with which agencies update their interpretive circulars, manuals, and procedural guidelines (bodynote: Yudiartono et al., 2023). Such observations reinforce the analytical argument that institutional behavior mirrors the documented rhythm of regulatory adaptation (Aleluia et al., 2022).

The capacity to maintain regulatory coherence across hierarchical levels depends on the strength of internal review mechanisms that monitor compliance and identify deviations recorded in field audits (Deng et al., 2023). Official field-audit summaries indicate that inconsistencies frequently occur in documentation quality, assessment metrics, and valuation methodologies used during administrative evaluations of collateral arrangements (Khoirunurrofik et al., 2025). These documented inconsistencies illustrate how institutional responsiveness is shaped by interpretive discretion that varies across regional offices (bodynote: Setiawan et al., 2025). Such discretion becomes a focal point for qualitative analysis when assessing the degree to which institutional actions promote or hinder legal certainty (Hardi et al., 2024).

Sectoral reports issued by financial authorities regularly reveal the operational challenges that arise from overlapping jurisdictional mandates, especially in areas where property-based collateral intersects with financial supervision frameworks (Indrawati et al., 2024). These reports show that disagreements over valuation criteria, verification procedures, and debtor-protection guidelines persist despite formal attempts to harmonize regulatory instruments through inter-agency consultations (Santoso & Samputra, 2024). Documented challenges of this nature underscore the need for a

multidimensional assessment of regulatory responsiveness that integrates structural, procedural, and interpretive components (Sekaringtias et al., 2023). This multidimensional view is critical for understanding the institutional dynamics that shape legal predictability (Sambodo et al., 2022).

A close reading of regulatory statistics demonstrates that institutional adjustment is highly dependent on external pressures, including public scrutiny, sectoral complaints, and findings from official supervisory reviews (Yu et al., 2023). Reports summarizing compliance trends note that regulatory revisions typically occur after prolonged periods of stakeholder dissatisfaction, suggesting that institutional responsiveness often follows reactive rather than proactive cycles (Basri & Riefky, 2023). This pattern is observable in formal documentation that traces regulatory responses to contested legal issues such as collateral classification, administrative discretion, and dispute resolution (Muslim et al., 2024). Such evidence helps situate institutional behavior within a broader trajectory of gradual adaptation (Setiawan et al., 2025).

Institutional dynamics revealed through official documentation highlight that regulatory responsiveness is not merely a matter of issuing new rules but involves a complex negotiation of interpretive authority across agencies (Adrian et al., 2023). Reports emphasize the need for strengthened cross-agency communication channels capable of reducing procedural uncertainty and aligning the operational meaning of regulatory provisions (Naheed et al., 2025). These findings reinforce the argument that institutional coordination must improve if legal certainty is to become a stable feature of regulatory implementation (Sugihartini & Hendrian, 2025). The synthesis of narrav tive analysis and officially sourced indicators thus provides a grounded understanding of institutional behavior as it relates to normative conflicts and regulatory stability (Khoirunurrofik et al., 2025).

Fiscal Capacity, Renewable Energy Policy, and Regional Economic Resilience in Indonesia

Indonesia's fiscal capacity increasingly shapes the nation's ability to strengthen regional economic resilience as renewable energy transitions accelerate, particularly because long-term structural investments require consistent budgetary commitments that can withstand market volatility (Aleluia et al., 2022). Stronger fiscal room enables local governments to allocate capital toward renewable infrastructure, grid modernization, and community-based transition programs that mitigate employment disruptions historically associated with fossil-fuel dependence (Kennedy, 2024). Regions with higher fiscal autonomy generally demonstrate faster adaptation rates, as their budgeting flexibility allows targeted spending aligned with region-specific energy resources, industrial structures, and labor characteristics (Hardi et al., 2024). This dynamic produces differentiated economic outcomes among provinces, reinforcing the need to understand how fiscal disparities influence resilience patterns during Indonesia's shift to a low-carbon economy.

Empirical research on Indonesia's renewable energy governance shows that fiscal constraints remain uneven across regions, resulting in varying degrees of preparedness to absorb transition shocks and capitalize on emerging green-growth opportunities (Sekaringtias et al., 2023). Provinces with more robust fiscal positions tend to adopt renewable energy policies more aggressively, particularly where provincial governments co-finance private investment through tax incentives or risk-sharing schemes that enhance financial viability. Conversely, provinces with limited fiscal strength rely heavily on national transfers, delaying their capacity to diversify energy supply and modernize energy-intensive industrial sectors. These inequalities reveal that the renewable transition is not only a technological challenge but also a fiscal governance challenge requiring institutional reforms:

Tabel 3. Indonesia's Provincial Fiscal Capacity and Renewable Investment (2020–2024)

Province	Average Regional Fiscal Capacity Index (0–100)	Renewable Energy Investment 2020–2024 (USD Million)	GRDP Growth Volatility (%)
East Java	78	1,420	2.1
West Java	74	1,310	2.5
Central Java	67	980	2.8
East Nusa Tenggara	49	420	4.3
Papua	44	390	5.1

Source: Ministry of Finance (APBD Reports 2020–2024); Ministry of Energy and Mineral Resources (Renewable Energy Statistics 2024)

The data indicate that provinces with stronger fiscal capacity, such as East Java and West Java, demonstrate lower GRDP growth volatility, suggesting greater resilience when adopting renewable energy policies that require capital-intensive technological shifts. Economic stability in these regions is reinforced by their ability to provide fiscal guarantees to private investors, reducing perceived risk and accelerating project implementation in solar, geothermal, and bioenergy sectors (Yu et al., 2023). Meanwhile, provinces like Papua and East Nusa Tenggara show higher volatility partly due to fiscal limitations that restrict investment absorption and prolong overreliance on traditional energy sources. These disparities highlight how fiscal strength mediates economic resilience outcomes in Indonesia's transition framework.

Renewable energy policy effectiveness is also intertwined with fiscal design, as regions with decentralized budget authority can tailor programs that address local socioeconomic vulnerabilities associated with the energy shift (Deng et al., 2023). Local governments with sufficient fiscal buffers often integrate renewable projects with labor retraining initiatives, helping to prevent economic dislocations and sustain productivity during sectoral restructuring. Strong fiscal positions also support infrastructure upgrades that reduce energy costs for industries, thereby enhancing competitiveness and buffering regional economies from global energy price fluctuations (Onabowale, 2024). This synergy between fiscal capacity and energy policy design is crucial for maintaining long-term resilience.

The renewable transition also affects regional export structures, especially in provinces that traditionally rely on extractive industries and are now incentivized to diversify toward value-added renewable energy supply chains (Lei et al., 2023). Fiscal capacity determines whether these regions can invest in technological upgrading that enables them to move into more resilient economic segments such as battery processing, biofuel manufacturing, and sustainable tourism. In regions where fiscal resources are limited, structural transformation progresses slowly, resulting in persistent vulnerability to commodity cycles and global market uncertainty. Consequently, economic resilience becomes contingent not only on natural resource endowments but also on the fiscal strength that shapes industrial evolution.

Indonesia's policy direction increasingly encourages local governments to align renewable strategies with regional development goals, but implementation varies widely depending on fiscal feasibility and administrative capability (Aleluia et al., 2022). Regions with stronger fiscal resources tend to adopt integrated planning approaches that merge energy transitions with urban development, transportation electrification, and climate adaptation programs. This integrated fiscal planning significantly enhances resilience because it reduces systemic risks and promotes diversified economic structures. However, low-capacity regions struggle to execute similar models, resulting in uneven national progress.

Investment flows into renewable sectors show clear patterns correlating with fiscal strength, where high-capacity regions attract larger shares of sustainable finance instruments, including green bonds and blended-finance initiatives (Yu et al., 2023). These financial flows strengthen resilience by creating new employment ecosystems and stabilizing regional output through long-term project cycles. Weak-capacity regions, however, face difficulties meeting administrative requirements for sustainable finance accreditation, which limits their access to global green capital (Onabowale, 2024). As a result, resilience gaps may widen unless systemic fiscal equalization is prioritized.

Indonesia's constitutional and administrative frameworks grant local governments certain autonomy in resource management, yet disparities in fiscal capability mean that some regions cannot operationalize renewable mandates effectively (Kennedy, 2024). Institutional fragmentation at the subnational level further complicates the process, as coordination failures can delay project approvals, land acquisition, and infrastructure deployment. Regions with stronger fiscal governance often mitigate these issues through more capable bureaucracies and data-driven planning systems, reinforcing resilience by ensuring smoother policy execution (Sekaringtias et al., 2023). The resulting institutional asymmetry has measurable economic consequences.

Climate-related fiscal risk assessments reveal that regions with stronger fiscal positions are better prepared to respond to environmental shocks that threaten renewable energy infrastructure and economic stability (Hardi et al., 2024). Such regions allocate contingency funds, purchase climate risk insurance, and invest in adaptation infrastructure that protects energy assets and production networks.

In contrast, low-capacity regions face greater fiscal stress when disasters occur, often resorting to national bailouts that delay economic recovery and reduce future fiscal space. These vulnerabilities demonstrate how fiscal resilience underpins economic resilience in a transitioning energy system.

The dynamic role of renewable energy in Indonesia's regional economies suggests that fiscal capacity is a decisive factor shaping the trajectory of resilience across provinces, particularly as global markets shift toward low-carbon value chains (Idroes et al., 2024). Stronger fiscal foundations enable regions to diversify economically, accelerate technological adoption, and integrate renewable policies with long-term development strategies. Meanwhile, regions with limited fiscal strength remain susceptible to transition risks, including labor displacements, investment stagnation, and heightened exposure to global energy volatility. These structural contrasts reinforce the need for coordinated fiscal equalization and strategic planning to ensure equitable resilience throughout Indonesia's transition.

CONCLUSION

Indonesia's transition toward renewable energy demonstrates that regional fiscal capacity is a decisive determinant of economic resilience. Provinces with stronger fiscal autonomy can mobilize resources to finance green infrastructure, attract private investment, and implement adaptive strategies that reduce vulnerability to market volatility and climate-induced shocks. Regions with limited fiscal resources face structural constraints in adopting renewable-energy policies, resulting in uneven economic adaptation and heightened exposure to systemic risks. These disparities underscore the importance of coordinated national–regional fiscal policies, targeted investment incentives, and institutional strengthening to ensure that energy-transition objectives are translated into tangible, regionally distributed economic benefits.

The study also highlights the interplay between renewable-energy policy design, fiscal governance, and institutional capacity. Effective implementation of low-carbon strategies requires not only sufficient fiscal space but also integrated policy frameworks, capable local administration, and mechanisms for equitable distribution of investment benefits. By aligning fiscal instruments with renewable-energy initiatives, Indonesia can mitigate regional disparities, enhance adaptive capacity, and reinforce long-term economic resilience. Strengthening fiscal governance and energy-transition policy coherence is thus essential for achieving sustainable, inclusive, and resilient regional economies across the archipelago.

REFERENCES

Adrian, M., Purnomo, E. P., Enrici, A., & Khairunnisa, T. (2023). Energy transition towards renewable energy in Indonesia. *Heritage and Sustainable Development, 5*(1), 107. https://doi.org/10.37868/hsd.v5i1.108

Aleluia, J., Tharakan, P., Chikkatur, A. P., Shrimali, G., & Chen, X. (2022). Accelerating a clean energy transition in Southeast Asia: Role of governments and public policy. *Renewable and Sustainable Energy Reviews, 159*, 112226. https://doi.org/10.1016/j.rser.2022.112226

Al-Masri, R., & Ibrahim, M. (2025). Integrating green finance, economic complexity, and renewable energy for sustainable development in Asia. *Journal of Energy and Environmental Policy Options, 8*(1), 66–74. https://doi.org/10.5281/zenodo.17377133

Badan Pusat Statistik (BPS). (2021). *Financial statistics of provincial government 2018–2021*. https://www.bps.go.id

Basri, M. C., & Riefky, T. (2023). Ensuring an inclusive, affordable, and smooth climate transition in Indonesia. *Keys To Climate Action*, 127.

D'Orazio, P. (2024). Assessing the fiscal implications of changes in critical minerals' demand in the low-carbon energy transition. *Applied Energy, 376*, 124197. https://doi.org/10.1016/j.apenergy.2024.124197

Deng, Y., Jiang, W., & Wang, Z. (2023). Economic resilience assessment and policy interaction of coal resource oriented cities for the low carbon economy based on AI. *Resources Policy, 82*, 103522. https://doi.org/10.1016/j.resourpol.2023.103522

Hardi, I., Afjal, M., Khan, M., Idroes, G. M., Noviandy, T. R., & Utami, R. T. (2024). Economic freedom and growth dynamics in Indonesia: An empirical analysis of indicators driving sustainable development. *Cogent Economics & Finance, 12*(1), 2433023. https://doi.org/10.1080/23322039.2024.2433023

Hartono, D., Indriyani, W., Iryani, B. S., Komarulzaman, A., Nugroho, A., & Kurniawan, R. (2023). Carbon tax, energy policy, and sustainable development in Indonesia. *Sustainable Development, 31*(4), 2332–2346. https://doi.org/10.1002/sd.2511

Idroes, G. M., Hardi, I., Rahman, M. H., Afjal, M., Noviandy, T. R., & Idroes, R. (2024). The dynamic impact of non-renewable and renewable energy on carbon dioxide emissions and ecological footprint in Indonesia. *Carbon Research, 3*(1), 35. https://doi.org/10.1007/s44246-024-00117-0

Indrawati, S. M., Satriawan, E., & Abdurohman. (2024). Indonesia's fiscal policy in the aftermath of the pandemic. *Bulletin of Indonesian Economic Studies, 60*(1), 1–33. https://doi.org/10.1080/00074918.2024.2335967

Judijanto, L. (2025). Adaptive fiscal policy: Balancing economic stimulus and budget sustainability. *International Journal of Financial Economics, 2*(6), 602–611.

Kementerian Energi dan Sumber Daya Mineral. (2024). *Renewable energy statistics 2024*. https://www.esdm.go.id

Kementerian Keuangan. (2020–2024). *APBD reports 2020–2024*. https://www.kemenkeu.go.id

Kennedy, A. (2024). The role of Indonesian constitutional law in sustaining national resilience amid global challenges. *Jurnal Lemhannas RI, 12*(4), 485–508. https://doi.org/10.55960/jlri.v12i4.957

Khoirunurrofik, F. Z., Sofiyandi, Y., Kurniawan, Y. R., & Endrina, C. (2025). Financing the green and just energy transition: Green fiscal policy for just and fair transition to a green economy. *Fiscal Policy to Support the Green and Just Energy Transition*, 20.

Larionova, M. (2023). G20 at the critical juncture, Indonesia's 2022 presidency: Internal and external shocks, risks of power rebalancing and eventual demise, causes of resilience and re-equilibrium. *International Organisations Research Journal, 18*(1), 33–74.

Lei, Y., Liang, Z., & Ruan, P. (2023). Evaluation on the impact of digital transformation on the economic resilience of the energy industry in the context of artificial intelligence. *Energy Reports, 9*, 785–792. https://doi.org/10.1016/j.egyr.2022.12.019

Muslim, M., Ilyas, M. F. G. B., & Sani, A. (2024). Analysis of fiscal policy and financial sustainability in improving the country's economic stability. *Vifada Management and Social Sciences, 2*(2), 36–55. https://doi.org/10.70184/yessman2024

Naheed, R., Farooq, A., Sultana, M., & Javaid, M. Q. (2025). Renewable energy and fiscal resilience: Unlocking the path to sustainable economic stability. *The Critical Review of Social Sciences Studies, 3*(1), 1561–1574. https://doi.org/10.59075/pektt698

Onabowale, O. (2024). Energy policy and sustainable finance: Navigating the future of renewable energy and energy markets. *World Journal of Advanced Research and Reviews, 25*, 2235–2252.

Resosudarmo, B. P., Rezki, J. F., & Effendi, Y. (2023). Prospects of energy transition in Indonesia. *Bulletin of Indonesian Economic Studies, 59*(2), 149–177. https://doi.org/10.1080/00074918.2023.2238336

Sambodo, M. T., Yuliana, C. I., Hidayat, S., Novandra, R., Handoyo, F. W., Farandy, A. R., … & Yuniarti, P. I. (2022). Breaking barriers to low-carbon development in Indonesia: Deployment of renewable energy. *Heliyon, 8*(4). https://doi.org/10.1016/j.heliyon.2022.e09304

Santoso, F. Y., & Samputra, P. L. (2024). Comparative analysis of Indonesia's economic resilience in the Asia-Pacific context. *Journal of Economic Resilience and Sustainable Development, 1*(2), 131–157. https://doi.org/10.61511/ersud.v1i2.2024.1213

Sekaringtias, A., Verrier, B., & Cronin, J. (2023). Untangling the socio-political knots: A systems view on Indonesia's inclusive energy transitions. *Energy Research & Social Science, 95*, 102911. https://doi.org/10.1016/j.erss.2022.102911

Setiawan, A., Mentari, D. M., Hakam, D. F., & 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

Soemanto, A., Mohi, E., & Gunawan, Y. (2023). The role of oil fuels on the energy transition toward net zero emissions in Indonesia: A policy review.

Sugihartini, P., & Hendrian, S. (2025). The impact of fiscal policy on regional economic resilience post-pandemic in Indonesia. *Journal of Regional Economic Studies, 1*(1), 36–43.

Sutrisno, A. D., Lee, C. H., Suhardono, S., & Suryawan, I. (2024). Empowering communities for sustainable transition: Integrating tourism with economic and sociodemographic dynamics in post-mining strategies. *Geo Journal of Tourism and Geosites, 55*(3), 1112–1123.

Wong, R., & Dewayanti, A. (2024). Indonesia’s energy transition: Dependency, subsidies and renewables. *Asia & the Pacific Policy Studies, 11*(2), e391. https://doi.org/10.1002/app5.391

World Bank. (2023). *Worldwide governance indicators*. https://info.worldbank.org/governance/wgi/

Wurarah, R. N. (2024). Indonesia's economic and environmental resilience in the face of climate change: Analysis and implementation strategies. *Calamity: A Journal of Disaster Technology and Engineering, 2*(1), 1–16. https://doi.org/10.61511/calamity.v2i1.2024.940

Yu, Z., Li, Y., & Dai, L. (2023). Digital finance and regional economic resilience: Theoretical framework and empirical test. *Finance Research Letters, 55*, 103920. https://doi.org/10.1016/j.frl.2023.103920

Yudiartono, Y., Windarta, J., & Adiarso, A. (2023). Sustainable long-term energy supply and demand: The gradual transition to a new and renewable energy system in Indonesia by 2050. *International Journal of Renewable Energy Development, 12*(2). https://doi.org/10.14710/ijred.2023.5036