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Environmental Law as an Instrument for Accelerating Renewable Energy in Indonesia: A Normative Analysis of Permitting, Ecological Justice, and Energy Transition Governance

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ABSTRACT
This article analyzes the role of environmental law in accelerating the development of renewable energy in Indonesia. The main issue examined is the lack of alignment between environmental protection mandates, energy transition targets, and a permitting framework that still tends to treat renewable energy projects as ordinary administrative matters rather than instruments for reducing ecological risks. The research employs a normative legal methodology with legislative, conceptual, and energy policy data analysis approaches. The findings indicate that environmental law has not yet been sufficiently established as an enabling regulatory framework to accelerate renewable energy in a fair manner. Major obstacles stem from the dominance of fossil fuels in the energy mix, regulatory fragmentation, uncertainty regarding incentives, limited local institutional capacity, and weak mechanisms for meaningful participation. This article emphasizes that accelerating renewable energy requires risk-based permitting reforms, harmonization of climate and energy policies, strengthening of ecological justice, and the design of local benefits so that the energy transition is not only low-emission but also legally and socially legitimate.

INTRODUCTION

The acceleration of renewable energy in Indonesia is not merely a matter of power generation technology, but an environmental law issue that determines the direction of the protection of the right to a good and healthy environment. The Constitution establishes the environment as a right of citizens, while the Law on Environmental Protection and Management provides the foundation for pollution prevention, damage control, and the enforcement of state responsibility in natural resource governance. Within this framework, renewable energy must be understood as a legal instrument to reduce the externalities of fossil fuels, not merely as an investment commodity. This position aligns with the literature that positions the energy transition as a legal, economic, and social agenda requiring regulatory certainty, environmental instruments, and protection for affected groups (Karim et al., 2020; Nurhidayah et al., 2024; Wahyuni et al., 2023). The acceleration of renewable energy in Indonesia is not merely a matter of power generation technology, but an environmental law issue that determines the direction of the protection of the right to a good and healthy environment. The Constitution establishes the environment as a right of citizens, while the Law on Environmental Protection and Management provides the foundation for pollution prevention, damage control, and the enforcement of state responsibility in natural resource governance. Within this framework, renewable energy must be understood as a legal instrument to reduce the externalities of fossil fuels, not merely as an investment commodity. This position aligns with the literature that positions the energy transition as a legal, economic, and social agenda requiring regulatory certainty, environmental instruments, and protection for affected groups (Karim et al., 2020; Nurhidayah et al., 2024; Wahyuni et al., 2023).

The gap between climate commitments and the realization of renewable energy demonstrates that the primary issue is not a lack of potential. The Ministry of Energy and Mineral Resources (ESDM)

states that Indonesia's potential for new and renewable energy reaches approximately 3,686 GW, encompassing solar, wind, hydro, bioenergy, geothermal, and ocean energy (Ministry of ESDM, 2023). A study by Pambudi et al. (2023) also indicates Indonesia's substantial technical potential for renewable energy, although estimated figures vary due to differences in calculation methods and resource categories. Challenges, however, arise in policy design, investment attractiveness, regulatory certainty, grid integration, electricity pricing, and environmental governance which currently fail to distinguish low-emission renewable projects from high-risk energy projects (Adharani et al., 2023; Kurniawan et al., 2022; Resosudarmo et al., 2023). National legal instruments have provided a substantial normative foundation. Law No. 30 of 2007 on Energy incorporates the principles of utility, rationality, efficiency, justice, and sustainability. Law No. 30 of 2009 on Electricity regulates electricity supply, public interest, and the state's role. Law No. 32 of 2009 on Environmental Protection and Management provides a foundation for prevention through strategic environmental assessments, environmental impact assessments (EIA), UKL-UPL, quality standards, environmental permits, monitoring, and administrative, civil, and criminal sanctions. At the policy level, Government Regulation No. 79 of 2014 on the National Energy Policy, Presidential Regulation No. 22 of 2017 on the National Energy Master Plan (RUEN), and Presidential Regulation No. 112 of 2022 on accelerating the development of renewable energy for electricity supply reinforce the direction of the transition. The problem is that many of these norms have not yet formed a coherent and operational renewable energy environmental legal regime (Amalia et al., 2024; Imawan, 2022; Nasera et al., 2025).

Previous studies have examined renewable energy regulations, energy policies, and a just transition. Karim et al. (2020) compared the regulatory frameworks for renewable energy in Indonesia and India. Wahyuni et al. (2023) highlighted the tension between green legislation and state control in the draft law on new and renewable energy. Nurhidayah et al. (2024) emphasized the social implications of energy transition policies, while Resosudarmo et al. (2023) examined the prospects of Indonesia's energy transition toward net-zero emissions. On the environmental front, Adharani et al. (2023), Handayani et al. (2025), and Sawaludin et al. (2025) demonstrate that environmental law must be directed not only toward mitigating impacts but also toward accelerating the adoption of cleaner energy options. An academic gap that still needs to be clarified is how environmental law can function as an instrument for accelerating renewable energy without compromising the principles of precaution, public participation, and ecological justice. Based on these issues, this article aims to analyze the role of environmental law in accelerating renewable energy in Indonesia. The article's contribution lies in the formulation that environmental law must operate through four functions: corrective against fossil fuel dominance, preventive against ecological risks of energy projects, facilitative toward renewable energy investments that meet environmental standards, and distributive regarding the benefits and burdens of the transition. Thus, environmental law does not merely function as a permitting mechanism but becomes a governance architecture to ensure that the energy transition proceeds swiftly, lawfully, and fairly.

RESEARCH METHODS

This study employs a normative legal method using a legislative approach, a conceptual approach, and a policy analysis approach. The primary legal materials analyzed include the 1945 Constitution of the Republic of Indonesia, Law No. 30 of 2007 on Energy, Law No. 30 of 2009 on Electricity, Law No. 32 of 2009 on Environmental Protection and Management, Law No. 16 of 2016 on the Ratification of the Paris Agreement, Government Regulation No. 79 of 2014 on National Energy Policy, Government Regulation No. 22 of 2021 on the Implementation of Environmental Protection and Management, Presidential Regulation No. 22 of 2017 on the National Energy Roadmap (RUEN), and Presidential Regulation No. 112 of 2022 on the acceleration of renewable energy development for electricity supply. Secondary legal materials were obtained from journal articles, reports from international institutions, government reports, and energy policy studies relevant to environmental law, renewable energy, the " " licensing governance, and a just transition. The analysis was conducted qualitatively by assessing the consistency of legal norms, the adequacy of legal instruments, and the alignment between energy policy targets and environmental protection principles. Quantitative data was used sparingly to clarify legal issues, particularly regarding the energy mix, fossil fuel dominance, and renewable energy potential. This data is not treated as primary statistical data but rather as policy data

that helps explain the urgency of legal reform for renewable energy (Ember, 2025; Ministry of Energy and Mineral Resources, 2023, 2024a; Pambudi et al., 2023).

The analytical framework of this article is built upon three criteria. First, regulatory coherence, which refers to the extent to which environmental law, energy law, and electricity law shape a mutually supportive direction for the transition. Second, the effectiveness of instruments, which refers to the ability of environmental permits, EIA, UKL-UPL, quality standards, incentives, and oversight to accelerate renewable energy without compromising environmental protection. Third, ecological justice, namely the ability of the law to ensure meaningful participation, benefit-sharing, protection of local communities, and reduction of social risks from energy transition projects (Bosselmann, 2016; Heffron & McCauley, 2018; Jenkins et al., 2016).

RESULTS AND DISCUSSION

The Dominance of Fossil Fuels and the Urgency of Reforming Environmental Laws

Energy mix data indicates that Indonesia is not yet on a path consistent with its energy transition targets. The 13.09% share of renewable energy in 2023 highlights a significant gap from the targets of the National Energy Policy and the National Energy Roadmap (RUEN), particularly as coal, crude oil, and natural gas still dominate over 86% of the national energy mix (Ministry of Energy and Mineral Resources, 2024a; Government Regulation No. 79 of 2014; Presidential Regulation No. 22 of 2017). This situation indicates that environmental legal challenges cannot be adequately addressed through downstream pollution control alone. Environmental law must be applied from the stages of energy selection, spatial planning, project financing, permitting, and electricity procurement to ensure that low-emission energy sources receive stronger legal certainty. The dominance of fossil fuels also creates an asymmetrical ecological burden. Coal-fired power plants generate higher emissions, particulate matter, waste, and health risks compared to many renewable energy sources. The literature on Indonesia's energy transition indicates that reliance on coal is shaped by the political-economic configuration, long-term power contracts, the interests of the extractive industry, and an energy pricing structure that does not yet fully reflect social and environmental costs (Resosudarmo et al., 2023; Setyowati, 2020; Sugiwan & Managi, 2016). Within the framework of environmental law, this situation demands the internalization of environmental costs and corrections to policy designs that indirectly perpetuate fossil fuels.

Presidential Regulation No. 112 of 2022 has become a key instrument as it regulates the acceleration of renewable energy development for electricity supply, including restrictions on the construction of coal-fired power plants with certain exceptions. However, the effectiveness of these regulations heavily depends on the consistency of their implementing policies, electricity supply business plans, pricing schemes, grid readiness, and environmental oversight capabilities. Without harmonization with environmental and spatial planning laws, the acceleration of renewable energy may be hindered by lengthy administrative processes or, conversely, risk creating new conflicts if public participation is ignored (Handayani et al., 2025; Nasera et al., 2025; Taufik, 2024).

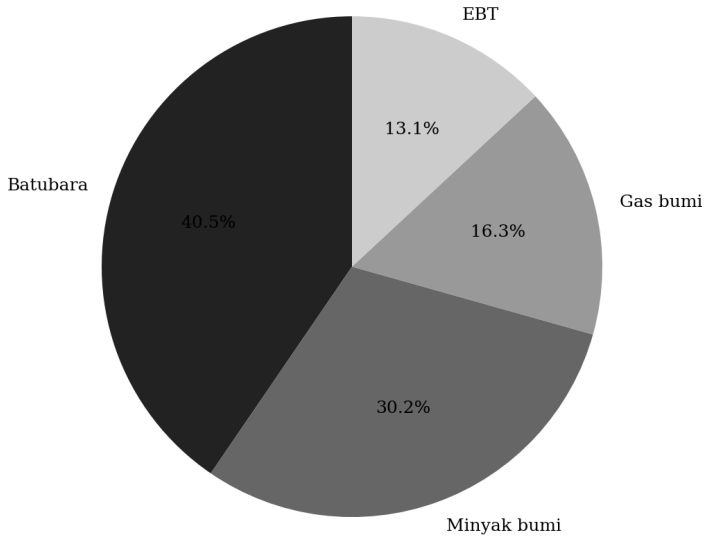

Figure 1 Indonesia's National Energy Mix in 2023
National Energy Council as cited by the Ministry of Energy and Mineral Resources (2024a).

Environmental law has long been understood as a restrictive regime—a mechanism to ensure that business activities do not exceed the environment's carrying capacity and resilience. In the context of renewable energy, this function remains important but is insufficient. Environmental law must evolve into enabling regulation—a legal framework that accelerates low-emission activities provided they adhere to the principles of precaution, ecosystem protection, and meaningful participation. This shift in function is relevant because while renewable energy generally contributes to emission reductions, each project type still carries specific risks, such as land-use changes, land conflicts, biodiversity disruption, landscape alterations, and social impacts on local communities (Adharani et al., 2023; Bosselmann, 2016; Pambudi et al., 2023). Risk-based permitting designs must distinguish project characteristics. Rooftop solar power plants, for example, do not share the same risk profile as large-scale hydro dams, geothermal projects in sensitive areas, or biomass projects dependent on land supply chains. Therefore, EIA and UKL-UPL should not be applied with a one-size-fits-all approach. Low-risk projects require expedited procedures, clear technical standards, and grid connection certainty. Projects with high ecological risks still require in-depth studies, public consultations, mitigation plans, and post-permit monitoring. This principle aligns with the concept of environmental approval reform for renewable energy, which emphasizes simplifying procedures without compromising the quality of environmental protection (Handayani et al., 2025; Sawaludin et al., 2025).

Indonesia's main issue is not merely the abundance of regulations, but the fragmentation among them. Energy regulations fall under the energy and electricity regime, environmental regulations under the PPLH regime, while investment policies and business facilitation often operate under the logic of economic acceleration. If these three regimes are not harmonized, environmental law may devolve into ineffective formal procedures, while renewable energy policies lose their driving force ( ). Harmonization must be achieved by integrating emission reduction targets, environmental protection, investment certainty, and community rights into a single regulatory framework (Amalia et al., 2024; Wahyuni et al., 2023).

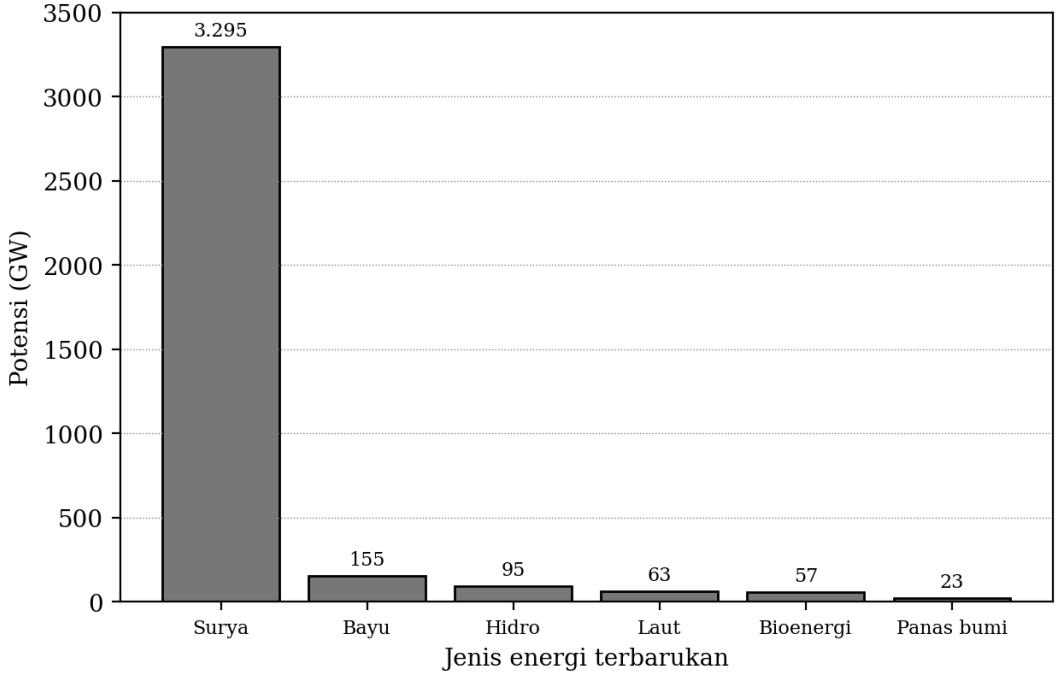

Figure 2 Indonesia's Renewable Energy Potential by Energy Source
Ministry of Energy and Mineral Resources (2023) and the national renewable energy presentation as compiled in Indonesia's renewable energy document.

Ecological justice and meaningful participation in renewable energy projects

Renewable energy is not inherently fair. Low-emission power plants can still cause injustice if project locations encroach on living spaces, limit communities' access to livelihoods, or shift ecological risks onto local communities. The literature on energy justice emphasizes three key dimensions: distributive justice, procedural justice, and recognition justice (Heffron & McCauley, 2018; Jenkins et al., 2016; McCauley & Heffron, 2018). In the language of Indonesian environmental law, these three dimensions can be interpreted as a balanced distribution of benefits and burdens, public access to information and participation, and recognition of local knowledge, vulnerable groups, and the right to a good and healthy environment. Meaningful participation must be incorporated from the planning stage, not after project decisions are nearly finalized. This principle is crucial because energy conflicts often arise not merely due to opposition to technology, but because communities feel they are merely treated as objects of public outreach. In renewable energy projects, public consultations must include information on benefits, risks, land-use changes, compensation distribution, environmental management plans, complaint mechanisms, and local benefit models. Environmental law must shift participation from a mere formality in documents to a deliberative mechanism capable of influencing project design (Nurhidayah et al., 2024; Setyowati, 2020; Taufik, 2024). Ecological justice is also linked to labor transitions and regional economies. Coal phase-out can impact workers, coal-producing regions, and local economic chains. Conversely, renewable energy development can create new jobs, but these do not always absorb those who lose jobs in the fossil fuel sector. Therefore, environmental law must be integrated with social protection, workforce retraining, local industry development, and project benefit-sharing. Without such a framework, the energy transition risks creating new inequalities even if it succeeds in reducing emissions (Asian Development Bank, 2023; ILO, 2015; Taufik, 2024).

Indonesia's renewable energy legal framework still faces normative fragmentation. The Energy Law mandates diversification and conservation but lacks sufficient detail to regulate the acceleration of renewable energy. The Electricity Law provides the foundation for electricity supply, but procurement practices and market structures still significantly determine project bankability. The Environmental Protection and Management Law (PPLH) provides environmental instruments but does not explicitly distinguish permitting pathways for low-emission projects. At the same time, the draft law on new and renewable energy has sparked debate because the term "new energy" risks conflating renewable energy with other technologies that have different risk profiles, such as nuclear power, coal downstream processing, or unconventional energy sources (Karim et al., 2020; Wahyuni et al., 2023).

The conflation of "new energy" and "renewable energy" can undermine legal clarity. Renewable energy refers to naturally renewable sources such as solar, wind, hydro, geothermal, sustainable bioenergy, and ocean energy. New energy is not necessarily low-risk and is not necessarily renewable. From an environmental law perspective, this distinction is crucial because each technology requires different safety standards, oversight, land-use planning, and accountability mechanisms. A legal framework that is too broad risks creating regulatory greenwashing—the use of green labels to justify projects that may not actually result in tangible reductions in ecological risk (Imawan, 2024; Wahyuni et al., 2023). A stronger legal architecture can be established through specific renewable energy legislation or a comprehensive revision of existing energy regulations. Its core provisions must include binding targets, stable pricing schemes, mandatory renewable electricity procurement, interconnection priorities, risk-based permitting standardization, spatial planning integration, energy storage regulations, consumer-prosumer protection, and local benefit mechanisms. This framework must align with the Paris Agreement, SDG 7, the National Energy Policy, the National Energy Master Plan (RUEN), and national electricity planning (IRENA, 2023; Ministry of Energy and Mineral Resources, 2024b; Republic of Indonesia, 2022). First, environmental permitting needs to shift from a general administrative approach to a risk-based system focused on technology and location. Rooftop solar and small-scale solar projects can undergo simpler approval procedures if they meet technical, safety, and spatial planning standards. Large-scale hydropower, geothermal projects in sensitive areas, and land-based biomass projects require more rigorous ecological and social assessments. This model does not weaken environmental law; rather, it makes the law function more precisely by directing oversight resources toward projects with higher risks (Handayani et al., 2025; Nasera et al., 2025).

Second, environmental law must integrate economic instruments. Carbon taxes, carbon trading, fiscal incentives, the elimination of misdirected fossil fuel subsidies, and green financing can serve as corrective mechanisms for energy prices that do not reflect environmental costs. Economic instruments must not stand alone; they must be linked to environmental standards, transparency of emissions data,

and oversight. Without such integration, economic instruments risk becoming mere accounting mechanisms that do not substantially alter the energy structure (Asian Development Bank, 2023; IEA, 2022; Resosudarmo et al., 2023).

Third, renewable energy policies must be situated within the framework of spatial planning and environmental carrying capacity. Solar, wind, hydro, geothermal, bioenergy, and ocean energy each require different amounts of space. Projects imposed without spatial consistency can lead to land conflicts, ecosystem degradation, or social resistance. Therefore, strategic environmental assessments, regional spatial plans, and local energy planning must be operationally linked. Local governments must not merely act as project recipients; regions must possess the capacity to assess spatial suitability, manage public participation, and ensure benefits for local communities (Ministry of Energy and Mineral Resources, 2024b; Government Regulation No. 22 of 2021; Presidential Regulation No. 22 of 2017). Fourth, strengthening oversight and law enforcement must remain the foundation. Renewable energy must not be exempted from environmental responsibility simply because it claims to have low emissions. Every project remains obligated to comply with environmental standards, implement management and monitoring plans, make data publicly available, and provide remediation mechanisms in the event of damage. The principle of strict liability in Indonesian environmental law, although subject to certain limitations, demonstrates that high-risk activities cannot be exempted from restoration liability. With strong oversight, the acceleration of renewable energy does not turn into ecological deregulation, but rather becomes smart regulation that distinguishes risks and accelerates cleaner technologies (Law No. 32 of 2009; Bosselmann, 2016). Fifth, the law must incorporate standards for local benefits. Renewable energy development will be more readily accepted if communities receive tangible benefits, such as access to electricity, job opportunities, training, community ownership schemes, social benefit funds, and protection of living spaces. International experience shows that the energy transition is more stable when communities are not merely treated as affected parties but also as beneficiaries and social watchdogs. This aligns with the principle of a just transition, which demands a balance between decarbonization, social protection, and democratic participation (Heffron & McCauley, 2018; ILO, 2015; Jenkins et al., 2016).

Based on the above, environmental law must be positioned as the primary instrument for restructuring incentives, procedures, and responsibilities in the energy transition. Accelerating renewable energy cannot be achieved solely through installed capacity targets. Such acceleration requires legal certainty, proportional procedures, ecological oversight, meaningful participation, and benefit-sharing. Without these elements, Indonesia may possess significant renewable energy potential but remain trapped in fossil fuel dominance and governance conflicts.

CONCLUSION

Environmental law holds a strategic position in accelerating renewable energy in Indonesia because it links the constitutional mandate for a good and healthy environment, emission reduction obligations, permitting governance, and justice for affected communities. This study demonstrates that the primary barriers to renewable energy do not lie in resource potential, but rather in regulatory fragmentation, fossil fuel dominance, uncertainty regarding incentives, permitting procedures that are not sufficiently risk-based, and weak mechanisms for meaningful participation. Legal reforms must be directed toward establishing a coherent renewable energy framework, clearly distinguishing between renewable energy and other high-risk energy categories, simplifying permitting for low-risk projects, strengthening oversight for high-risk projects, integrating spatial planning and strategic environmental assessments, and ensuring local benefits. With this direction, environmental law will not only serve as an instrument for impact control but also as a transformative tool to drive a rapid, low-emission, legally sound, and ecologically just energy transition.

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