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Designing Accountable Carbon Investment Instruments: An Administrative Law Approach to Energy Transition

Ilham Dwi Rafiqi[1*], Nikmah Mentari[2]

[1-2]Faculty of Law, Hang Tuah University, Indonesia
Email: ilham.rafiqi@hangtuah.ac.id

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Abstract

The acceleration of energy transition in Indonesia requires the development of credible and accountable carbon investment instruments capable of mobilizing sustainable financing while supporting national decarbonization targets. However, the effectiveness of carbon markets and other carbon-based investment mechanisms depends not only on economic incentives but also on the quality of administrative governance that ensures legal certainty, transparency, accountability, and institutional coordination. This article examines the design and governance of carbon investment instruments from the perspective of administrative law, focusing on the role of regulatory frameworks and public institutions in supporting Indonesia's energy transition agenda. Employing a normative juridical approach, the study analyzes relevant legislation, policy instruments, and scholarly literature. The findings reveal that accountable carbon investment instruments require a coherent regulatory design, effective inter-agency coordination, robust monitoring, reporting, and verification (MRV) systems, transparent administrative procedures, and meaningful public participation. The study further demonstrates that administrative law functions as a foundational mechanism for controlling regulatory discretion, preventing regulatory fragmentation, and strengthening institutional accountability in carbon governance. Despite recent regulatory developments, including the introduction of carbon pricing and carbon trading mechanisms, Indonesia continues to face challenges related to institutional overlap, regulatory harmonization, and implementation capacity. Consequently, strengthening administrative governance is essential to ensure that carbon investment instruments contribute effectively to a just energy transition.

Keywords: Carbon Investment Instruments; Administrative Law; Energy Transition; Carbon Governance; Indonesia

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INTRODUCTION

The accelerating climate crisis has positioned the global energy transition as an urgent and unavoidable policy priority (Huang, 2024). Over the past decades, a convergence of scientific, economic, and legal developments has intensified the shift toward low-carbon energy systems, highlighting the central role of regulatory frameworks in shaping sustainable investment flows (Alvarez & Viñuales, 2026). This transition is not merely technological but fundamentally institutional, requiring legal mechanisms capable of directing financial resources toward environmentally sustainable outcomes (Ramos Farroñán et al., 2025).

In this context, carbon investment instruments—such as carbon taxes, emissions trading systems (ETS), and carbon market mechanisms are developing as strategic policy tools to internalize environmental externalities while creating economic incentives for business actors to reduce emissions (Pan et al., 2024). Through these instruments, carbon is no longer positioned solely as waste, but is constructed as an economic asset that has exchange value and can be traded in a regulated market regime. This transformation allows the formation of a carbon price signal which functions as a corrective mechanism for market failures, as well as encouraging cost efficiency in decarbonization efforts (Sunanda et al., 2025).

Indonesia, as one of the developing countries with significant levels of emissions, faces structural challenges in integrating climate policy with economic development needs. Even though several policies have accommodated carbon investment instruments, such as regulating the domestic carbon market and Nationally Determined Contribution (NDC) commitments, the implementation of carbon investment in Indonesia is still not optimal (Kristianto, 2024). Carbon investment instruments in Indonesia are still at an embryonic stage, characterized by several things such as low transaction

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value (financing gap), total transactions on the Indonesian Carbon Exchange since its launch were only around IDR 77–78 billion with a volume of around 1.6 million–4.9 million tons of CO_2e (Indonesia Environment & Energy Center (IEC), 2025). In fact, Indonesia's total emissions reach more than 1 billion tons of CO_2e per year, so the carbon market contribution is still very marginal. Apart from that, there is minimal market participation, there are only around 132 active participants and 8 projects in the domestic carbon market. Transaction volume and value even decreased from 2023 to 2024, indicating a stagnation trend. As well as other structural problems that can affect success, such as weak policy incentives, institutional problems and regulatory governance (Nina Susilo, 2026). This condition indicates the need to redesign carbon investment instruments based on the principle of administrative accountability to ensure the effectiveness, legitimacy and sustainability of energy transition policies.

Research on carbon instruments and the energy transition has developed quite rapidly, but most of it still focuses on fiscal aspects, investment legal certainty and climate justice. One relevant study is the article by Francine Hug, "Do Just Energy Transition Partnerships Collide or Converge with Substantive Investment Law Standards? Case Studies from Indonesia and Vietnam," which analyzes JETPs from the perspective of international investment law (Hug, 2026). In contrast to these studies, this research uses an administrative law perspective to examine the accountability of carbon investment instruments at the national level. Research by Lawrence Daniel Ferwinz Andi Lolo et al. about carbon tax transparency is also relevant because it discusses carbon economic instruments, but focuses on the digitalization of carbon taxes as a supporter of low-carbon development (Lolo et al., 2022). Then the article from Dwi Marlianto "Legal Uncertainty in the Implementation of Carbon Tax on Foreign Investors in the Non-EBT Energy Sector" also has

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similarities in discussing the relationship between carbon policy and the investment climate in Indonesia (Dwi Marlianto, 2025). The difference is that previous research only focused on the issue of regulatory uncertainty for foreign investors, while this research further seeks to design carbon investment instruments that are accountable and capable of supporting the sustainable energy transition agenda. Based on this description, it can be concluded that there has been no research that comprehensively examines the design of carbon investment instruments using a state administrative law approach in the context of the energy transition in Indonesia.

The construction of carbon as a tradable commodity involves complex processes of valuation, standard-setting, and regulatory oversight, which in turn raise critical questions of to what extent carbon investments can effectively contribute to addressing climate change. In this context, the governance of carbon investment instruments cannot rely solely on market-based logic; rather, it necessitates a robust legal framework capable of ensuring transparency, participation, and enforceability. Therefore, designing accountable carbon investment instruments requires more than economic efficiency; it necessitates a comprehensive administrative law framework that aligns regulatory authority with principles of good governance. Based on this, this research asks the main question whether administrative law plays a transformative role in bridging the gap between environmental goals and investment realities, ultimately supporting a just and effective energy transition. To answer this problem construction will be carried out through an assessment of related concepts, principles and regulations. This research will specifically contribute to an accountability-based framework for carbon investment implementation and policy in Indonesia.

RESEARCH METHOD

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This study applies a normative legal research method that focuses on the analysis of legal norms, legal principles, and state administrative law doctrine as the primary foundation for designing accountable carbon investment instruments in Indonesia (Disemadi, 2022). Using a statutory approach, this study comprehensively examines various key regulations, such as Law Number 7 of 2021 concerning the Harmonization of Tax Regulations, Presidential Regulation Number 110 of 2025 concerning the Implementation of Carbon Economic Value Instruments and National Greenhouse Gas Emission Control (hereinafter referred to as Presidential Regulation 110/2025), and Minister of Forestry Regulation Number 6 of 2026. This approach aims to map the existing legal architecture and identify challenges such as regulatory fragmentation and overlapping authority between institutions in cross-sectoral carbon governance (Antony et al., 2026). Conceptually, this study integrates the classic functions of state administration into the energy transition ecosystem. This conceptual approach positions the state as responsible for ensuring that carbon market mechanisms not only pursue economic efficiency but also comply with the principles of good governance (Suteki & Taufani, 2018). Through this combination of methods, the study seeks to formulate an accountable design for carbon investment instruments to support a just and sustainable national decarbonization agenda (Tan, 2021).

RESULT AND DISCUSSION

Administrative Law as a Foundation for Accountable Carbon Investment Governance

Indonesia's energy transition agenda is a consequence of the national commitment to reduce greenhouse gas emissions and achieve the Net Zero Emissions (NZE) target by 2060 or sooner. The main challenge in achieving this target is the significant financing requirements for developing renewable energy,

increasing energy efficiency, and decarbonizing the industrial and electricity sectors (Qurbani & Rafiqi, 2025). In this context, carbon investment instruments have developed as an economic mechanism aimed at internalizing the costs of emissions while creating new financing sources for low-carbon projects. The development of carbon investment instruments in Indonesia is inextricably linked to the shifting paradigm of global environmental policy, which is shifting from a command-and-control regulatory approach to a market-based approach (Rafiqi & Mentari, 2024).

The development of carbon investment instruments within the global energy transition agenda demonstrates that market mechanisms cannot operate effectively without adequate regulatory or policy support. Therefore, this paper will specifically utilize an administrative law perspective to ensure that carbon investment instruments operate appropriately and efficiently. In this context, state administrative law can serve as a normative framework governing the relationship between the state, business actors, financial institutions, and the public in managing carbon policies. Instruments such as carbon trading, carbon offsets, carbon taxes, and energy transition financing schemes require administrative legitimacy to ensure legal certainty, accountability, and institutional coercion. Therefore, the success of carbon investment governance is determined not only by economic efficiency but also by the quality of the administrative arrangements that support its implementation.

Theoretically, modern state administrative law evolved from the concept of the welfare state, which positions the government as the primary actor in controlling public policy through regulatory, distributive, and administrative oversight powers (Levi-Faur, 2014). Within the framework of the energy transition, this function is evident through the establishment of carbon market regulations, the granting of environmental permits, emissions monitoring, and the control of green

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investments. Sareen & Haarstad emphasize that the energy transition is not merely a technological transformation, but also a matter of institutional legitimacy and accountability. They point out that an accountability crisis arises when there is a gap between the power of decision-makers and the communities affected by decarbonization policies. Therefore, energy governance reform must be built through administrative mechanisms capable of ensuring fairness, transparency, and public oversight (Sareen & Haarstad, 2020). Furthermore, the administrative approach places procedures as a central element in the legitimacy of carbon policy. Lövbrand and Stripple further explain that modern carbon market governance is formed through various administrative procedures such as emissions verification, reporting systems, certification mechanisms, and environmental performance standards. Thus, the carbon market is not merely an economic mechanism, but also an administrative space controlled through complex regulatory and oversight techniques. The state continues to play an important role as '*meta-governor*' determining the structure and validity of these procedures (Lövbrand & Stripple, 2012).

In the Indonesian context, the state administrative law approach to the energy transition can be seen through the government's function in implementing *beleid*, *regelendaad*, *bestuursdaad*, and *toezichthoudensdaad*. The government not only forms regulations, but also administers, manages and supervises national energy policies. This model shows that energy governance and carbon investment are basically manifestations of state administrative actions which must be directed towards the greatest prosperity of the people and environmental protection (Azhar & Satriawan, 2018). Furthermore, administrative accountability in carbon investment is not only formal, but also substantive. This means that administrative compliance cannot be used as absolute legitimacy if investment policies or activities continue to cause ecological damage or

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social injustice. This approach emphasizes that administrative supervision must be oriented towards environmental protection and the community's right to a good and healthy living environment. Thus, administrative law functions as an instrument of power control as well as a means of correcting deviations in natural resource governance and carbon investment (Pahlefi et al., 2026).

The urgency of state administrative law in carbon investment governance is also seen in the need for institutional coordination. The energy transition involves many institutions across sectors, starting from the Ministry of the Environment/Environmental Control Agency, Ministry of Forestry, Ministry of Energy and Mineral Resources, Financial Services Authority, to Regional Governments. Without good administrative coordination, regulatory fragmentation and overlapping authority will emerge, which has the potential to create legal uncertainty for investors. Several studies on the governance of the energy transition in Indonesia show that decentralization of authority often results in policy asymmetry between the central and regional governments. This condition affects the effectiveness of implementing low-carbon energy policies and slows down the realization of green investment (Setyowati & Quist, 2022).

From a global perspective, strengthening administrative frameworks is becoming increasingly important as carbon investments today develop within transnational governance networks involving states, international institutions, the private sector and non-governmental organizations. This condition causes a shift in the regulatory model from government to governance. In this system, the state is no longer the only controlling actor, but functions as a coordinator and supervisor of various non-state actors. Therefore, state administrative law must transform to become more adaptive and responsive to the dynamics of the global carbon market, including through

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digitalization of supervision, openness of emissions data, and technology-based environmental audit mechanisms.

Thus, it can be emphasized that state administrative law is the main foundation in building accountable carbon investment governance. Through the principles of legality, transparency, supervision and public participation, administrative law provides legitimacy as well as limits to the use of state authority in managing carbon investment instruments. Without a strong administrative foundation, the energy transition risks producing governance that is elitist, non-transparent and vulnerable to abuse of power. On the other hand, strengthening administrative mechanisms will create a fairer, more credible and sustainable carbon investment system in supporting the national and global decarbonization agenda.

Accountability Mechanisms in Carbon Investment Instruments

Accountability is a key prerequisite for the success of carbon investment instruments in supporting the energy transition and achieving decarbonization targets. Without robust accountability mechanisms, instruments such as emissions trading systems (ETS), carbon offsets, voluntary carbon markets (VCM), and various forms of carbon financing risk losing legitimacy due to greenwashing practices, emissions data manipulation, double counting, and weak oversight of claimed environmental impacts. Therefore, establishing accountability mechanisms aims not only to ensure administrative compliance but also to ensure environmental integrity, market transparency, and the protection of the public interest.

Accountability for carbon investment instruments must be established through an integrated approach. This framework should include at least five key components: (1) *A credible Monitoring, Reporting, and Verification (MRV) system*. In carbon governance, MRV is generally the most fundamental

accountability mechanism in carbon investment instruments. MRV has been incorporated into the governance of emission control and carbon economic value instruments. The current framework specifically Presidential Regulation 110/2025—explicitly positions transparency, monitoring, and evaluation frameworks as integral components of implementing carbon economic value instruments. Technical regulations were also previously established through the Regulation of the Minister of Environment and Forestry Number 21 of 2022 concerning Procedures for the Implementation of Carbon Economic Value, which governs the implementation procedures for carbon economic value, including measurement and verification mechanisms.

An MRV system enables the measurement of emissions, reporting of emission reduction results, and independent verification of claims made by carbon market actors. Bellassen et al. call MRV the "cornerstone" of all carbon pricing and emissions management mechanisms because the quality of the carbon market depends heavily on the accuracy of the information generated by the system. Without a credible MRV, the economic value of carbon becomes unverifiable and loses its basis for legitimacy (Bellassen et al., 2015).

In practice, MRV functions to reduce information asymmetry between regulators, investors and carbon project developers. This system ensures that each carbon credit traded actually represents a real, measurable and verifiable reduction or absorption of emissions. Apart from that, MRV is also an administrative monitoring instrument that allows the government to evaluate the effectiveness of carbon policies and prevent manipulation of emissions data (Gupta et al., 2012). However, various studies show that the effectiveness of MRV often faces challenges in the form of high verification costs, limited data, methodological inconsistencies, and dependence on independent verification parties. In many cases, MRV system

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weaknesses are one of the main factors triggering a crisis of confidence in voluntary carbon markets (Christiansen, 2025).

(2) *Independent third-party verification*. Accountability in carbon investments also relies heavily on the existence of independent verification bodies. Third-party verification ensures that reported carbon emissions and reduction data reflect actual conditions on the ground. This mechanism is not yet regulated in current regulations, but it is becoming regulators do not always have the technical capacity or resources to directly audit all operating carbon projects. The relationship between regulators, companies, and verification bodies is a strategic element in ensuring the integrity of the carbon market. When verification bodies lose their independence due to conflicts of interest or weak oversight mechanisms, the risk of data manipulation and rent-seeking behavior increases significantly. Therefore, accreditation systems, regular audits, administrative sanctions, and verifier performance evaluations are crucial components in designing carbon investment accountability (Shao et al., 2025).

(3) *Transparency and information disclosure*. In addition to technical oversight, accountability requires open information that allows the public to monitor the implementation of carbon investments. The principle of transparency requires that information regarding emission calculation methodologies, project documents, verification results, use of investment funds, and environmental impacts be openly and easily accessible. Transparency is a crucial tool for reducing the risk of 'greenwashing', the practice of claiming environmental benefits that do not reflect actual conditions. Several controversies in the voluntary carbon market demonstrate that a lack of information disclosure often prevents investors and the public from evaluating the validity of traded emission reduction claims. Publication of project data and documentation is an integral part of accountability mechanisms (Sasaki, 2025).

Transparency and openness of information have a relatively strong legal basis. Presidential Regulation 110/2025. In the carbon trading sector, the Financial Services Authority Regulation (OJK Regulation Number 10 of 2026 concerning Amendments to the Financial Services Authority Regulation Number 14 of 2023 concerning Carbon Trading through the Carbon Exchange) has also established reporting obligations, supervision, governance, and mechanisms for organizing carbon exchanges. However, there is still room for strengthening the aspect of substantive information disclosure, especially regarding emission calculation methodology, baseline assumptions, verification results, double counting risks, environmental and social benefits of projects, as well as public access to information that allows the public to carry out meaningful scrutiny. The challenge shifts from simply providing information to ensuring that the information is complete, searchable, accessible and understandable to the public.

Within the framework of state administrative law, transparency also manifests the principle of open government. The government is obligated to provide access to public information related to carbon policies so that the public can exercise social control over administrative actions taken by regulators and business actors. Thus, transparency serves not only as a technical tool but also as a means of democratizing carbon investment governance.

(4) *Effective law enforcement*. Accountability mechanisms will not be effective without adequate law enforcement instruments. Therefore, carbon investment governance must be complemented by a system of administrative, civil, and criminal sanctions for violations. Accountability mechanisms will not be effective without the support of adequate law enforcement instruments. For this reason, carbon investment governance must be equipped with a system of administrative, civil and criminal sanctions for violations that occur. Currently law

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enforcement focuses on administrative and supervisory instruments. PP Number 22 of 2021, for example, regulates guidance, supervision and the imposition of administrative sanctions in the implementation of environmental protection and management. In the context of the carbon exchange, POJK Number 14 of 2023 also regulates supervision and sanctions for the implementation of carbon trading, which was then updated through POJK Number 10 of 2026 to adapt the legal framework to Presidential Decree Number 110 of 2025.

Law enforcement is necessary to ensure that all market actors have a strong incentive to comply with carbon integrity standards. Weak oversight and a low probability of sanctions encourage companies to report inaccurately or overstate their emissions reductions. Conversely, the existence of a strict oversight system and effective sanctions increases compliance rates and strengthens the credibility of the carbon market. In this context, state administrative law provides oversight instruments through administrative audits, permit revocations, certification cancellations, project freezes, and the imposition of administrative fines for detected violations.

(5) *Meaningful public participation*. Developments in environmental governance theory demonstrate that accountability extends not only vertically between regulators and business actors, but also horizontally through public participation. The involvement of civil society, local communities, environmental organizations, and affected groups serves as a crucial oversight mechanism for carbon investment implementation. Public participation enables early identification of risks that might otherwise go undetected through formal administrative mechanisms. In land-based carbon projects, for example, local communities often have more accurate information about the environmental conditions and social impacts of the project. Therefore, public consultation mechanisms, grievance mechanisms, and access to decision-

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making processes must be part of the design of carbon investment accountability (Gupta et al., 2012).

The combination of these five elements allows the creation of carbon investment governance that is not only economically efficient, but also has legal legitimacy, environmental integrity and high social acceptability. However, all these elements can only function optimally if the fundamental aspects of law are improved, especially regulations and institutions. Therefore, the final part of this discussion will explain in full the regulatory design and institutional arrangements in an effort to realize accountability for Carbon Investment in Indonesia.

Regulatory Design and Institutional Coordination

Regulatory design and institutional coordination are the two main pillars in building effective governance of carbon investment instruments in Indonesia. As a country committed to achieving Nationally Determined Contribution (NDC) and Net Zero Emissions targets by the mid-21st century, Indonesia has developed various legal instruments that integrate climate change, carbon trading and energy transition policies. However, the effectiveness of these instruments is highly dependent on the government's ability to create a coherent regulatory framework and institutional coordination system that is able to address the cross-sectoral complexity inherent in carbon governance.

Regulatory design functions as a legal architecture that determines how authority, procedures and monitoring mechanisms are implemented in managing carbon investments. Indonesia's regulatory framework currently relies on several main instruments, such as Law Number 7 of 2021 concerning Harmonization of Tax Regulations, as well as Presidential Regulation 110/2025, which are the main legal basis for implementing national carbon trading. Presidential Regulation 110/2025 introduces various carbon economic mechanisms, including emissions trading, carbon offsets, results-based

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payments, and carbon levies as instruments to control greenhouse gas emissions. Then, the most recent one was followed up in Minister of Forestry Regulation Number 6 of 2026 concerning Procedures for Carbon Trading Through Greenhouse Gas Emission Offsets in the Forestry Sector.

The design of Indonesia's carbon policy reflects a shift from a command-and-control regulatory approach to market-based environmental governance. The state no longer only relies on licensing instruments and administrative sanctions, but also creates economic incentives that encourage business actors to reduce emissions efficiently. This approach is in line with Gunningham's view which emphasizes that modern environmental regulation requires a combination of administrative instruments and market mechanisms to achieve sustainability goals (Gunningham, 2009).

However, various studies show that the design of Indonesia's carbon regulations still faces challenges in the form of fragmentation of norms and lack of optimal harmonization between sectors. Carbon regulations are spread across various legal instruments managed by different ministries and institutions, giving rise to potential policy inconsistencies and legal uncertainty for investors. Several studies highlight that there is still uncertainty regarding the relationship between carbon trading, carbon rights, forestry governance, green investment, and the international carbon trading system based on Article 6 of the Paris Agreement (Yoel et al., 2025).

The quality of regulation is determined not only by the substance of the rules, but also by the level of coherence between the legal instruments that govern them. The Organization for Economic Co-operation and Development (OECD) emphasizes that good regulation must meet the principles of consistency, coordination, and predictability to create a stable investment environment. In the Indonesian context, the need for regulatory coherence is increasingly pressing because carbon investment is

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directly related to the energy, forestry, land, capital markets, and international trade sectors. One of the main challenges is harmonizing domestic regulations with international standards, particularly the mechanism of Article 6 of the Paris Agreement, global carbon integrity standards, and international trade policies such as the European Union's Carbon Border Adjustment Mechanism (CBAM). Inconsistencies between national regulations and international standards have the potential to reduce the competitiveness of Indonesia's carbon credits in the global market and hinder the flow of green investment.

Apart from that, the issue of recognizing carbon rights and benefit sharing still requires clearer regulation. Unclear status of carbon rights can lead to conflict between the government, investors, indigenous communities and land rights holders. Therefore, regulatory reform also needs to be directed at strengthening legal certainty regarding carbon ownership, distribution of economic benefits, and protection of local community rights.

Another aspect that is no less important in regulatory design is preventing 'regulatory capture'. In the Indonesian energy sector, research shows that the influence of economic interest groups can influence the policy formation process, resulting in regulations that benefit industry players more than the public interest. Similar risks may arise in the development of carbon investment instruments due to the high economic value traded in the carbon market. Transparency, public participation, and independent oversight must be an integral part of the institutional design of carbon trading. This accountability mechanism can be realized through information disclosure, public consultation, administrative audits, supervision by independent institutions, as well as public access to objection and dispute resolution mechanisms. This approach is in line with the principles of good governance which places transparency

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and accountability as the main conditions for the legitimacy of public policy.

The characteristics of carbon governance are basically 'cross-sectoral governance'. Therefore, the success of carbon investment is not only determined by the quality of regulations, but also by the effectiveness of coordination between government agencies. In Indonesia, carbon management involves various institutions, including: Ministry of the Environment/Environmental Control Agency, Ministry of Forestry, Ministry of Energy and Mineral Resources, Ministry of Finance, Ministry of Investment/BKPM, Financial Services Authority (OJK), Indonesian Carbon Exchange (IDXCarbon), and local governments. The complexity of these actors creates significant coordination challenges. Literature on natural resource governance in Indonesia shows that overlapping authority between institutions often results in administrative conflicts, policy asymmetry and weak implementation of regulations. Similar problems are also starting to appear in carbon trading governance, especially regarding the division of supervisory authority, carbon credit registration and emissions verification mechanisms.

Cross-sector coordination becomes increasingly important when a policy involves many organizations with interdependent goals. In the Indonesian context, the energy transition and carbon investment are clear examples of a '*whole-of-government approach*' that is becoming increasingly relevant. This model emphasizes the importance of cross-sector policy integration through structured administrative coordination mechanisms. It is not enough for the government to just form regulations, but must also create a coordination system that is able to unite various sectoral interests into a common goal of decarbonizing the economy.

To transform the conceptual design into an effective operational framework and implement a whole-of-government

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approach, inter-authority coordination is structured through three concrete pillars, namely the Institutional Coordination Model, Clarity in the Distribution of Supervisory Responsibilities, and Data Sharing Mechanisms & System Interoperability. The institutional coordination model has been implemented by the Indonesian Government by forming a Steering Committee based on Article 96 of Presidential Regulation 110/2025 which regulates cross-ministerial forums related to the implementation of NEK instruments to achieve NDC and control GHG emissions for development. As for supervisory responsibilities, they are regulated in various separate arrangements, but if they are mapped based on the domain of function and authority of each institution:

Table 1. Government Authority in the Implementation of Carbon Investment

Institution	**Roles and Responsibilities**	**Coordination Model**	**Data Sharing and Interoperability Mechanisms**
Coordinating Ministry for Food Affairs / Chair of the Steering Committee	Aligning sectoral decarbonization targets, addressing regulatory fragmentation, and leading the determination of policy direction for the Carbon Economic Value (NEK).	Leading the cross-ministerial NEK Steering Committee to realize a whole-of-government approach.	Accessing an integrated executive dashboard for the periodic evaluation of progress toward NDC and Net Zero Emissions targets.
Ministry of Environment	Oversees environmental integrity, establishes emission baselines and offset methodologies, issues emission reduction certificates, and	Coordinates with technical ministries and local governments regarding the registration and validation of emission reduction projects.	Manages the National Registry System for Climate Change Control (SRN-PPI), which is integrated via API with carbon exchanges and technical ministries.

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	regulates carbon rights.		
Ministry of Energy and Mineral Resources	Establishes and oversees emission caps for industrial and energy facilities, and monitors sectoral emission compliance.	Coordinates with the Ministry of Environment (KLH) on setting emission quota allocations and cap-and-trade mechanisms.	Links sectoral emission reporting systems (such as SIMPEL/APPLE-Gatrik) to the SRN-PPI for periodic emission verification.
Ministry of Finance	Oversees the implementation of fiscal instruments, the governance of carbon taxes/levies, and the provision of green investment incentives.	Harmonizes carbon tax policies with carbon market mechanisms through the Steering Committee.	Exchanges carbon trading transaction data between SRN-PPI and IDXCarbon to serve as the basis for carbon tax/levy collection.
Otoritas Jasa Keuangan (OJK) & IDXCarbon	Oversee the reliability of the carbon exchange, trading mechanisms, and investor protection, as well as prevent price or market manipulation.	Coordinate with the Ministry of Environment and Forestry (KLH) and the Ministry of Finance (Kemenkeu) to ensure the legitimacy of carbon trading instruments.	Integrate real-time exchange transaction data with the SRN-PPI system to prevent double counting.
Ministry of Investment / BKPM	Oversee the fulfillment of green investment commitments and facilitate streamlined	Coordinate with sectoral ministries to ensure legal certainty regarding	Synchronize green investment realization data with the national carbon registry system.

	licensing for carbon projects.	carbon investments for investors.	
Local Government	Oversees the implementation of carbon projects in the region, ensures benefit-sharing, and protects the rights of indigenous and local communities.	Implements multi-level governance through regular coordination between central and local governments.	Handles regional-level emission data reporting and project verification directly linked to the SRN-PPI.

Source: Author, 2026

Likewise, the mechanisms for data sharing & system interoperability are basically regulated in current regulations, but are spread across various technical regulations and across ministries. For this reason, the government needs to build a real-time automatic data exchange protocol (API Integration) between the government's National Climate Change Control Registry System (SRN-PPI) with the Carbon Exchange trading platform (IDXCarbon), sectoral emissions reporting systems (such as SIMPEL/APPLE-Gatrik ESDM), as well as the OJK monitoring system. This integrated data sharing ensures transparency of information, strengthens the credibility of the MRV system, and technically prevents double recording or double counting of carbon credits traded in both domestic and international markets.

Another very important aspect is administrative accountability. In the energy transition, the government is not only required to achieve emission reduction targets, but also ensure that the decision-making process takes place in a transparent and participatory manner. The just energy transition concept emphasizes that energy transformation must pay attention to social justice, protection of vulnerable groups, and community involvement in the policy process. This is in line with the '*multi-level governance approach*', namely a management

system that involves interaction between the central government, regional governments, state-owned enterprises, the private sector, civil society and international organizations. In the Indonesian context, the decentralized characteristics of government mean that the success of the energy transition depends not only on national policies, but also on the administrative capacity of local governments in implementing the low-carbon energy agenda.

Furthermore, to create carbon investment through a just energy transition, an '*adaptive administrative governance*' model is also needed, namely governance that is able to adapt to technological changes, global energy market dynamics and developments in international climate policy. This need is increasingly urgent considering that the energy transition is taking place amidst rapid changes in green investment, carbon trading, and demands for achieving Indonesia's targets through Nationally Determined Contribution (NDC) and Net Zero Emissions.

CONCLUSION

This study concludes that the development of accountable carbon investment instruments is a crucial pillar for the success of the energy transition agenda in Indonesia. A state administrative law approach provides a crucial normative foundation for transforming carbon from mere waste into a credible economic asset through regulatory (*regelendaad*), management (*bestuursdaad*), and oversight (*toezichthoudensdaad*). Without a robust administrative framework, carbon market instruments risk falling into greenwashing practices and losing public legitimacy. The research findings suggest that the accountability of carbon investment instruments in Indonesia must be built on five key integrated components: a credible Monitoring, Reporting, and Verification (MRV) system, independent third-party verification, information transparency,

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effective law enforcement, and meaningful public participation. Although the government has introduced various regulations such as Presidential Regulation 110/2025, implementation still faces structural challenges in the form of regulatory fragmentation, unclear carbon rights status, and overlapping authority between institutions. Therefore, a redesign of governance that prioritizes regulatory coherence and institutional coordination through a whole-of-government approach is needed. Strengthening adaptive and responsive administrative law will not only increase market confidence and the international competitiveness of domestic carbon credits, but also ensure a just energy transition while prioritizing environmental protection and public welfare. Ultimately, the effectiveness of carbon investments is determined not only by economic efficiency but also by the quality of the administrative integrity that underpins them.

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DECLARATION OF GENERATIVE AI USE

The authors declare that no generative artificial intelligence tools were used in the preparation of this manuscript.

COMPETING INTERESTS

The authors have declared that no competing interests exist.