



# Recommendations For Carbon Economic Value Governance Regulation: A Normative Analysis Of Carbon Trading In Indonesia

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**Abstract:** This research examines the weaknesses of carbon trading regulations in Indonesia, particularly within the framework of Law Number 32 of 2009 on Environmental Protection and Management (UUPPLH) in the context of climate change mitigation. Indonesia, as a country that has ratified the Paris Agreement, faces challenges in regulating carbon trading mechanisms to reduce greenhouse gas emissions. Although UUPPLH provides a legal basis for environmental management, it does not explicitly address carbon trading aspects, such as verification, monitoring, and transaction transparency. The study also recommends strengthening the legal system based on the principles of precaution, justice, and transparency, which would enhance the integrity of Indonesia's carbon market. The precautionary principle emphasizes the need for stricter environmental impact assessments to avoid unforeseen damage, while the principles of justice and transparency ensure equitable benefit distribution and open access for all stakeholders. By introducing clearer and more inclusive regulations, Indonesia is expected to manage carbon trading sustainably, reduce the potential for misuse, and effectively achieve emission reduction targets. This research also proposes improvements to policies to prevent carbon crimes and enhance oversight mechanisms. The research method used is normative juridical with legislative and conceptual approaches to analyze legal gaps and provide recommendations for strengthening regulations aligned with international legal principles and Indonesia's domestic needs.

**Keywords:** Carbon Trading; Environmental Legal Regulation; Justice; Precautionary Principle; Transparency

## 1. Introduction

As a member of the United Nations (UN), Indonesia has signed and ratified the Paris Agreement to United Nations Framework Convention on Climate Change / UNFCCC through Law Number 16 of 2016 (Wendra & Sutrisno, 2023).

The Intergovernmental Panel on Climate Change (IPCC) periodically provides comprehensive, objective, open, and transparent assessments of climate change (Deo & Prasad, 2022), including causes, impacts, and mitigation and adaptation options. The IPCC brings together scientists from around the world to advance knowledge about human-induced climate change (Rusbiantoro, 2008). The IPCC was established in 1988 by two UN organizations, namely the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to conduct a systematic review of the technical/scientific literature that has been reviewed and published (Hanarisanty & Pratama, 2022).

The IPCC report in its Sixth Synthesis of Assessments (AR6), published in March 2023, emphasizes the urgency of climate action to limit global warming to 1.5°C. Some of the key points of the AR6 Synthesis Report that are relevant to Indonesia include Increasing Global Warming, Worse Climate Change in the Short Term (Rahman et al., 2024).

Indonesia as an archipelagic country, flanked by two oceans and two continents, is an agrarian and developing country that is highly vulnerable to the impacts of climate

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change, such as sea level rise, floods, droughts, and extreme weather patterns that affect crop yields (Ainurrohmah & Sudarti, 2022). The IPCC report is an important basis for Indonesia to formulate more effective policies and measures to adapt and mitigate climate change.

The IPCC report emphasizes the importance of strengthening efforts to reduce greenhouse gas emissions both independently and with international cooperation. In response to these challenges, countries have begun to develop carbon trading mechanisms as part of market-based climate change mitigation strategies (Valentika & Turisno, 2024). Carbon trading is a medium for internalizing negative externalities due to greenhouse gas (GHG) emissions, which is in line with the environmental economic principle "polluter pays principle".

Not wanting to be left behind, Indonesia has also shown its commitment to the issue of climate change, one of which is through the stipulation of (Presidential Regulation Number 98 of 2021 Concerning the Implementation of Carbon Economic Value for the Achievement of Nationally Determined Contribution Targets and Control of Greenhouse Gas Emissions in National Development, n.d.)

Presidential Regulation Number 98 of 2021 concerning the Implementation of Carbon Economic Value (NEK) and its derivative regulations at the technical ministry level. Since the regulation was issued, discussions about the economic value of carbon and carbon trading have begun to receive attention from both the Indonesian people, environmental service business actors and the international community. However, this regulatory framework is derivative and administrative in nature, and does not yet have a normative basis and legal substance at the level of the law. Meanwhile, Law No. 32 of 2009 concerning Environmental Protection and Management (PPLH), which is the foundation of national environmental law, has not explicitly accommodated carbon trading schemes (Hutagalung et al., 2025), both in terms of governance, supervision, and sanctions.

Carbon trading is one of the rapidly growing policy instruments in an effort to overcome the global climate crisis. This mechanism gives economic value to carbon emissions, thus allowing businesses, states, and other institutions to trade rights to carbon emissions or sequestration. Globally, this scheme has been implemented through a cap and trade approach and offsetting in various countries such as the European Union, the United States, Australia, and several Southeast Asian countries. Carbon trading is the fastest growing commodity market in the world. In 2024, Bloomberg's Global Carbon Market Outlook predicts that prices in various carbon markets will increase to USD238/ton by 2050.

Given the rapid development of the carbon market and the nature of carbon credits as an intangible asset, it increases vulnerability to potential carbon crimes. Therefore, it is necessary to strengthen the legal framework and increase the capacity of law enforcement officials to anticipate the risk of carbon crimes that occur in carbon trading transactions (Kusumaningtyas, 2024). Achmad Santosa, an environmental law expert in an interview on one of the national news stated that there are a number of forms of crime that have the potential to occur in carbon trading. Citing reports published by the Environmental Crime Program Interpol 2023, Deloitte Forensic Australia 2009, and the International Organization of Securities Commission, 2023<sup>4</sup>, there are various modes and types of crimes in carbon trading, including, First, Sale of carbon credits that either do not exist or belong to someone else. The intangible nature of carbon credits allows for the separation of carbon rights ownership from its physical projects.

Second, Manipulating measurements to fraudulently claim additional carbon credits. Measurement Reporting and Verification manipulation to fraudulently claim additional carbon credits occurs in Clean Development Mechanisms projects, which generate carbon credits based on the difference in emissions that occur from the project compared to the usual scenario.

Third, Exploitation of weak regulations to commit financial crimes. The recent global financial crisis has clearly shown that current market regulatory methods are

vulnerable to manipulations such as tax evasion and money laundering. This is due to rapid investment growth, inadequate legal regulation and the intangible nature of carbon credits. The complexity of the carbon market that is difficult to regulate as well as weak regulation makes the carbon market easier to manipulate.

More fundamentally, normatively juridical, the regulation of carbon trading in Indonesia does not yet have a solid legal basis, especially at the legal level. Law Number 32 of 2009 concerning Environmental Protection and Management (PPLH) has not explicitly regulated the mechanism of carbon trading, both in terms of legal definition, legal subjects and objects, to governance and sanctions, both administrative, civil and criminal for violations, fraud and other unlawful acts in carbon trading. This legal vacuum poses a serious challenge in the implementation of a transparent, fair, and sustainable carbon market. Without a strong legal foundation, the carbon market in Indonesia is vulnerable to being used by business actors as a form of "greenwashing" rather than substantive mitigation efforts.

Based on the background of the above problems, it is very urgent and necessary to strengthen and develop regulations for the prevention and control of carbon crimes, including supervision and law enforcement and potential violations that occur in Indonesia. Therefore, the problems that will be discussed further in this study are, First, What are the weaknesses of carbon trading regulations in Indonesia based on Law Number 32 of 2009 concerning Environmental Protection and Management? second, how to recommend the carbon trading legal system based on the principles of precautionary, justice, and transparency.

## **2. Materials and Methods**

The research method applied is normative juridical, or often called doctrinal law research. It can be understood briefly as research that traces the existence of the law in a certain jurisdiction. Legal researchers in this case seek to collect and then analyze related legal regulations, such as Law Number 32 of 2009 concerning Environmental Protection and Management, therefore, this is also usually assisted by a legislative approach and a conceptual approach. (Tan, 2021).

## **3. Results and Discussion**

### ***3.1 Weaknesses of Carbon Trading Regulations in Indonesia Based on Law Number 32 of 2009 concerning Environmental Protection and Management***

As a country that has ratified the Paris Agreement through Law Number 16 of 2016, Indonesia is responsible for mitigating and adapting to climate change, including by developing a carbon trading mechanism (Law Number 16 of 2016 Concerning Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change, n.d.). Although Law Number 32 of 2009 concerning Environmental Protection and Management (UUPPLH) provide a general legal framework for environmental management (Efendi, 2016), There are several legal weaknesses or loopholes related to carbon trading that need to be considered, given the rapid development of the carbon market and the potential for crime that can arise. Based on the UUPPLH, below will be an analysis related to weaknesses or legal gaps in the regulation of carbon trading in Indonesia .

**Void of Specific Provisions on Carbon Trading.** The UUPPLH generally regulates environmental protection and management issues, but does not include more specific arrangements regarding carbon trading as one of the market mechanisms for climate change mitigation. Carbon trading refers to the purchase and sale of carbon credits that can be used by countries or companies to offset the greenhouse gas emissions they produce. The UUPPLH does not contain provisions on the establishment of a carbon trading system (Fenetiruma & Priyanto, 2025), verification of carbon credits, or regulatory mechanisms that support this.

Absence of Regulations That Guarantee Clarity and Security of Carbon Transactions (Halimanjaya et al., 2022). One of the important issues in carbon trading is the security of transactions related to the credibility and verification of the carbon credits being traded. Carbon as an intangible asset requires clear standards in terms of verification and recording of transactions to avoid fraudulent practices or carbon crimes, such as double recording or manipulation of emission data. The UUPPLH does not provide clear provisions regarding the mechanism for verification, certification, and supervision of carbon transactions that can ensure the transparency and validity of carbon credits.

A fairly important thing is the lack of Regulation on the Role of the Private Sector in Carbon Trading. Carbon trading involves not only the state, but also the private sector (Setiawan & Christina, 2024). Indonesia has great potential to involve the private sector in emission reduction projects that can generate carbon credits. However, the UUPPLH does not regulate in detail the participation of the private sector in the carbon market, including incentives and regulations that can encourage this sector to actively contribute to emission reductions. Without adequate regulation, the private sector may feel that there is no legal guarantee or certainty in participating in carbon trading.

In addition, there is an unclear Regulation on Supervision and Law Enforcement. In the context of carbon trading, there needs to be strict oversight to ensure that the carbon trading system runs effectively and in accordance with international standards. The UUPPLH does not explicitly mention oversight mechanisms related to carbon trading, such as oversight of companies that buy or sell carbon credits, as well as possible violations related to the manipulation of emissions data or the unauthorized use of carbon credits. Without clear enforcement mechanisms, there is potential for abuse of the carbon market (Adiwarman, 2024).

The absence of regulations on carbon trading between countries is also a matter that must be considered. As part of the Paris Agreement, Indonesia is committed to international cooperation in reducing greenhouse gas emissions. However, the UUPPLH does not contain clear rules on how carbon trading between countries can be conducted, especially in relation to different mechanisms for the recognition and transfer of carbon credits between countries. Without a clear legal basis, Indonesia could find it difficult to participate in international carbon trading mechanisms that can be part of climate change mitigation efforts.

Insynchronization with Climate Change and Carbon Trading Policy. Although Indonesia has ratified the Paris Agreement, which emphasizes the importance of reducing emissions and using market-based mechanisms, policies and regulations that are more detailed and in sync with these goals have not been fully reflected in the UUPPLH. Without rules that clarify how the carbon trading system can be implemented and integrated with other climate change mitigation policies, the potential to achieve emissions reduction targets will be limited.

The need for regulations on environmental impact assessments related to carbon projects. One of the challenges in carbon trading projects is how to manage the environmental impact of the resulting projects, such as land management for carbon sequestration or REDD+ (Reducing Emissions from Deforestation and Forest Degradation) projects. The UUPPLH regulates environmental impact assessments (EIAs), but there is no provision that links these impact assessments directly to projects that generate carbon credits. This is necessary to ensure that projects that generate carbon credits actually provide real environmental benefits and do not actually damage ecosystems.

Lack of Guidance on Financing and Incentives for Emission Reductions. In order to encourage emission reduction through carbon projects, clear incentives and financing are needed, both from the public and private sectors. The UUPPLH does not provide sufficient guidelines on how financing schemes or incentives for carbon reduction and trading projects can be properly structured. Without incentives or financial support, projects that generate carbon credits may not thrive optimally.

### 3.2 *Recommendations for a Carbon Trading Legal System Based on the Principles of Precautionary, Justice, and Transparency*

Continuing the previous analysis, it is important to suggest a legal system of carbon trading based on the principles of precautionary, justice, and transparency. These three principles can provide a solid basis for Indonesia to develop effective, fair, and transparent regulations in the carbon trading system that support climate change mitigation and prevent unintended adverse impacts.

The precautionary principle emphasizes the importance of precautions even though scientific evidence regarding potential risks is not yet fully available (Kriebel et al., 2001). In the context of carbon trading, this principle is particularly relevant to prevent environmental risks that can arise from the implementation of emission reduction projects, such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation) projects or tree planting (Aryal et al., 2024).

The implementation of the Precautionary Principle in the Carbon Trading Legal System starts from a more stringent Environmental Impact assessment. Every project involved in carbon trading should be required to conduct a more comprehensive Environmental Impact Assessment (EIA) (Gibson & Fonseca, 2022). For example, REDD+ projects that aim to reduce deforestation must be assessed for their impact on biodiversity, local communities, and existing ecosystems. This will identify potential damage or imbalances that may arise after the project begins, such as degradation of soil quality or unexpected disturbances to the ecosystem balance.

Furthermore, the provisions for Dealing with Scientific Uncertainty. Carbon trading involves a lot of scientific uncertainty regarding the carbon sequestration capacity in projects, such as reforestation projects or land management. The legal system must take this uncertainty into account by creating conservative standards (Kocher, 2024) in calculating the amount of carbon credits that can be obtained from a project. Regulations should require the use of careful calculations and backup recording in case of an unexpected change in the desired outcome of the project.

Finally, it needs continuous supervision and evaluation. Carbon projects must be monitored continuously to ensure that they continue to function as promised and do not cause further damage to the environment (Wang et al., 2021). An independent third-party continuous evaluation mechanism should be put in place, including retesting of carbon sequestration capacity at clear and regular intervals.

The principle of fairness emphasizes on the fair sharing of benefits and responsibilities in carbon trading, especially between developing and developed countries, as well as between the public and private sectors (Prihatiningtyas et al., 2023). Indonesia, as a developing country, must ensure that carbon trading not only benefits those with more resources, but also provides fair benefits to local communities and vulnerable communities. The implementation of the Principle of Justice in the Carbon Trading Legal System starts from the empowerment of Local Communities and Indigenous Peoples. Local communities and indigenous peoples should be actively involved in emission reduction projects. For example, in a REDD+ project, communities living around forests that are objects of conservation should be given the right to participate in decision-making, and they should be able to enjoy the economic benefits of the project, such as ecotourism-based income or cooperation in agroforestry projects. The legal system must ensure that agreements with local communities include fair compensation and that they do not lose access to the natural resources that are part of their daily lives.

It is also necessary to carry out a fair distribution of benefits. Carbon trading systems should be designed to ensure that the economic benefits derived from carbon credits are distributed equitably between developed countries, developing countries, and local communities. Indonesia may consider establishing community-based carbon projects that provide direct funding for sustainable development in the affected areas.

Next, pay attention to Incentives for Developing Countries. Indonesia, as a country that is highly vulnerable to the impacts of climate change, needs to gain better access to international carbon markets with financial and technical incentives. For example, de-

veloped countries that buy carbon credits from Indonesia should support green technology and development capacity to strengthen mitigation efforts at the domestic level.

The third principle is the Principle of Transparency. Transparency is a fundamental principle in carbon trading that ensures that all aspects of carbon transactions are accessible to the public and related parties, thus preventing potential fraud, data manipulation, or corruption. Given that carbon credits are intangible assets, the principle of transparency is essential to ensure that Indonesia's carbon market functions with integrity. The implementation of the Transparency Principle in the Carbon Trading Legal System is carried out by providing Open and Accessible Data. All information related to emission reduction projects, including carbon credits, verification methodologies, emissions calculations, and social and environmental impacts should be publicly provided and accessible to the public. For example, data on the amount of carbon credits generated by a project and who buys it should be available in a platform that is accessible to the general public.

Second, Verification by Independent Parties is also quite important. The verification process must be carried out by an independent third party that has international credibility. These verification bodies must be accredited in accordance with international standards, such as those set by the Gold Standard or Verified Carbon Standard (VCS), and the results of the verification must be publicly published.

Integrated Information Platform. Indonesia can build a digital platform that enables real-time monitoring of carbon transactions, emission calculations, and verification of the credibility of carbon credits. The platform should be accessible to the public, government agencies, and non-governmental organizations (NGOs) focused on the environment, to ensure that no transactions are hidden or manipulated.

Finally, Periodic Reports and Public Audits. All listed carbon projects must provide periodic reports that include an evaluation of the social and environmental impacts of the project. In addition, these reports should be audited by a third party and audit results should be published transparently so that the public can assess the success or failure of the project.

### ***3.3 Recommendations for the Carbon Trading Legal System in Indonesia.***

To realize a carbon trading legal system based on the principles of precautionary, justice, and transparency, Indonesia needs to develop policies and regulations that include the following: (a) Establishment of Special Regulations on Carbon Trading. Indonesia needs to develop specific laws or regulations that explicitly regulate carbon trading mechanisms, in terms of verification, audit, certification, and supervision. (b) Community Participation in Decision Making. All projects that generate carbon credits must involve local communities in the planning and implementation process, as well as ensure that they derive equitable economic benefits. (c) Institutional Strengthening. Establish an independent agency responsible for the verification and monitoring of carbon projects to ensure that the data collected is accurate and transparent. (d) Technology Incentive and Support System: The government should provide fiscal incentives or green technology subsidies to companies or countries that develop emission reduction projects that can generate legitimate and sustainable carbon credits.

## **4. Conclusions**

Although the UUPPLH provides a legal basis for environmental management, there are several weaknesses and legal gaps that need to be addressed in relation to carbon trading. Indonesia needs to develop additional regulations that can accommodate carbon trading mechanisms, including clearer arrangements regarding carbon credit verification, transaction supervision, private sector engagement, and participation in international carbon markets. Tackling carbon crime and implementing effective law enforce-

ment mechanisms are also indispensable to ensure the integrity of the carbon market in Indonesia

Applying the principles of precautionary, justice, and transparency in the carbon trading legal system in Indonesia will strengthen the sustainability of a fair and effective carbon market. Through regulations that ensure environmental safety, social justice, and information transparency, Indonesia can play an active role in mitigating climate change, increasing the credibility of carbon trading, and reducing the potential for carbon abuse or crime. It will also ensure that Indonesia can achieve its emission reduction targets in a sustainable and socially responsible manner. A phased implementation strategy should begin with establishing specific regulations on verification, monitoring, and private sector participation, coupled with robust public awareness and stakeholder involvement. Gradually, this transition from administrative to legal frameworks can be achieved through pilot projects, capacity building, and aligning policies with international standards, ensuring political, technical, and social acceptance.

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