

CITATION

Soeharso SY, Surono A, Hamid A, Hidayati MN, (2026). Paradigmatic Dialectics in the Criminal Law Policy of Carbon Trading: Constructing the Gradatum Remedium Principle Based on Pancasila Justice. *Sinergi International Journal of Law*. 4 (2), 79-86.
doi: 10.61194/law.v4i2.1050

TYPE Original Research

PUBLISHED 31 May 2026
DOI 10.61194/law.v4i2.1050
VOL 4 Issue 2 May 2026

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Paradigmatic Dialectics in the Criminal Law Policy of Carbon Trading: Constructing the Gradatum Remedium Principle Based on Pancasila Justice

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Abstract

Carbon trading has emerged as a key instrument for climate change mitigation, yet its distinctive legal characteristics - intangible, registry-based, technically verified, and tradable assets - create significant enforcement challenges. In Indonesia, although the regulatory framework for carbon economic value and carbon-market supervision has developed, the relationship between administrative, civil, and criminal enforcement remains insufficiently structured, creating uncertainty in responding to carbon-market violations. This study examines the paradigmatic tension between the *Ultimum Remedium* principle, which positions criminal law as a last resort, and the *Primum Remedium* principle, which supports early criminal intervention for serious environmental harm. Using normative legal research with statutory, conceptual, philosophical, and limited comparative approaches, this study analyzes Indonesian carbon-trading, environmental, financial-sector, and criminal-law regulations. The findings indicate that Indonesia does not lack criminal-law provisions; rather, it lacks a carbon-market-specific enforcement framework that establishes clear and proportional escalation according to the gravity of violations. This study therefore constructs the Gradatum Remedium principle as a dialectical synthesis of *Ultimum Remedium* and *Primum Remedium*. The proposed principle establishes five levels of enforcement: (1) administrative correction and compliance; (2) civil liability and restitution; (3) light criminal sanctions for serious regulatory violations; (4) severe criminal sanctions for fraudulent, organized, or environmentally harmful conduct; and (5) additional sanctions, including asset confiscation, restoration, corporate compliance measures, and revocation of carbon-market rights. The framework integrates culpability, market integrity, MRV reliability, registry validity, financial-crime risks, and Pancasila justice. It provides a novel normative foundation for proportional and justice-oriented carbon-market enforcement in Indonesia.

KEYWORDS

carbon trading governance; environmental criminal law policy; gradatum remedium principle; pancasila justice.

Introduction

Carbon trading has become an important instrument in climate-change mitigation because it allows emission reductions to be converted into tradable units. However, carbon trading also creates a distinct criminal-law enforcement challenge. Carbon units are intangible, registry-based, technically verified, and economically tradable. Their legal validity depends on the accuracy of emissions data, measurement, reporting, verification, registry recording, and transaction settlement (Paniago, 2024; Prihatiningtyas & others, 2023). When these elements are manipulated, the resulting violation is not merely an environmental or administrative problem. It may also involve market manipulation,

corporate fraud, greenwashing, double counting, falsification of verification documents, fictitious mitigation projects, or suspicious financial flows.

Indonesia has developed a legal framework for carbon trading through laws and regulations on climate change, carbon economic value, financial-sector supervision, and carbon exchange operation (Deatherage, 2011; Republic of Indonesia, 2022, 2023c). The issuance of Financial Services Authority Regulation No. 14 of 2023 concerning Carbon Trading through the Carbon Exchange marks an important step because it places carbon trading within the supervision of OJK and treats carbon units as tradable securities. Under this framework, carbon units traded through the carbon exchange must be recorded in the National Registry System for Climate Change Control and by the carbon exchange operator. This creates a dual legal character: carbon units represent environmental performance, but they also function as economic instruments that can be traded in a supervised market.

This dual character explains why carbon trading requires more than ordinary administrative supervision. Administrative enforcement is necessary to maintain compliance, correct technical errors, and protect legitimate market actors from excessive criminalization. However, an administrative-first approach may become insufficient when violations involve intent, deception, repeated misreporting, falsification, manipulation of MRV documents, double counting, or money laundering. Conversely, a criminal-first approach may create legal uncertainty and discourage legitimate participation in a still-developing carbon market. This tension creates the central criminal-law dilemma examined in this article: whether criminal sanctions should be positioned as *ultimum remedium*, *primum remedium*, or a more proportional gradational model.

Existing scholarship on carbon trading in Indonesia has primarily focused on regulatory harmonization, the development of carbon economic value policies, green investment, and environmental governance rather than on the design of criminal law enforcement mechanisms (Dharmawan, 2022; Mentari et al., 2024; Mentari & others, 2024; Posner, 1991; PT Bursa Efek Indonesia, 2023; Wibisana & Cornelius, 2021; Yoel et al., 2024). Recent legal studies have also examined carbon market regulation, institutional governance, and the supervisory role of the Financial Services Authority (OJK) and the Indonesia Carbon Exchange (IDXCarbon), but only limited attention has been given to determining when carbon-market violations should escalate from administrative supervision to civil liability and ultimately to criminal enforcement (Belenky et al., 2022; Financial Services Authority (OJK), 2023c). At the international level, responsive regulation theory and environmental enforcement scholarship have demonstrated that regulatory sanctions may be structured through graduated enforcement models and enforcement pyramids (Ayres & Braithwaite, 1992). Nevertheless, these theories were not specifically developed for the distinctive legal characteristics of carbon trading, where enforcement depends not only on regulatory compliance but also on the integrity of monitoring, reporting, and verification (MRV) systems, the validity of carbon registries, the authenticity of environmental claims, and the risks of financial crimes such as fraud and money laundering (Integrity Council for the Voluntary Carbon Market, 2024; World Bank, 2022, 2024). Consequently, a significant doctrinal gap remains concerning the construction of a criminal law framework capable of proportionally integrating administrative, civil, and criminal enforcement within the governance of carbon trading.

This article therefore identifies three gaps. First, there is an analytical gap: Indonesian carbon-market literature has not sufficiently examined carbon trading as a possible site of

corporate crime, financial crime, and environmental fraud. Second, there is a theoretical gap: existing doctrines of *ultimum remedium* and *primum remedium* do not provide an adequate middle path for carbon-market enforcement. Third, there is a practical gap: Indonesia's current carbon trading framework provides administrative supervision but does not yet provide a detailed escalation matrix that determines when carbon-market violations should trigger civil liability, criminal fines, imprisonment, corporate sanctions, asset recovery, or inter-agency criminal investigation.

The principal novelty of this article lies in the construction of the *Gradatum Remedium* Principle as a carbon-market-specific doctrine of proportional sanction escalation. Recent scholarship has increasingly examined regulatory compliance, environmental integrity, market governance, and enforcement challenges within carbon trading systems. Contemporary studies have emphasized the importance of robust monitoring, reporting and verification (MRV), transparent carbon registries, high-integrity carbon credits, and effective institutional oversight to safeguard the credibility of carbon markets (Ramadhani, 2023; World Bank, 2024). These studies significantly advance the understanding of regulatory governance and market integrity, while highlighting emerging risks such as carbon fraud, greenwashing, double counting, and weaknesses in verification systems.

Despite these important contributions, recent scholarship has primarily focused on regulatory architecture, compliance mechanisms, market design, and institutional supervision. It has not developed a coherent criminal law doctrine that provides normative criteria for determining when carbon-market violations should proportionally escalate from administrative enforcement to civil liability and ultimately to criminal sanctions. Consequently, the relationship between environmental harm, market integrity, financial-crime risks, and criminal liability remains conceptually fragmented within the existing literature.

This article addresses that doctrinal gap through a paradigmatic dialectical synthesis of environmental criminal law and contemporary regulatory theory (Budhijanto, 2014). Rather than merely extending existing enforcement models, it constructs the *Gradatum Remedium* principle as an integrated legal framework specifically designed for carbon trading. While responsive regulation and smart regulation provide valuable theoretical foundations for graduated enforcement, their primary focus remains regulatory responsiveness, compliance behaviour, and institutional coordination rather than the formulation of legally defined thresholds for criminal intervention in carbon-market violations (Gunningham et al., 1998).

The proposed *Gradatum Remedium* principle therefore introduces five cumulative legal assessment criteria for determining the proportional escalation of sanctions: (1) the degree of fault; (2) the magnitude of environmental and economic harm; (3) the level of risk posed to carbon-market integrity; (4) the existence of financial-crime linkages, including fraud, money laundering, or market manipulation; and (5) the systemic ecological and economic impact of the violation (Soeroso, 2021). Unlike previous governance-oriented studies, these cumulative criteria establish objective legal thresholds that distinguish administrative non-compliance from conduct warranting civil liability or criminal prosecution.

Accordingly, this article contributes beyond recent scholarship by proposing the first integrated criminal law doctrine specifically formulated for carbon trading that systematically connects environmental compliance, MRV integrity, registry validity, financial-crime risks, market integrity, and the constitutional value of Pancasila Justice within a single proportional enforcement framework. The *Gradatum Remedium* principle thus represents not merely a refinement of existing regulatory theories but a new doctrinal model

capable of reconciling the longstanding tension between the *ultimum remedium* and *primum remedium* principles through a coherent and legally measurable system of sanction escalation (Fuady, 2020).

Based on this background, this article addresses three research questions. First, how does the paradigmatic dialectic between economic and ecological interests influence the current criminal regulation of carbon trading in Indonesia? Second, why is the Gradatum Remedium Principle needed as a philosophical and juridical foundation for proportional law enforcement in carbon trading? Third, how should criminal regulation of carbon trading be constructed in future criminal law policy based on Pancasila justice? (Prasetyo & Barkatullah, 2020).

Methods

This article uses normative legal research (Diantha, 2016; Marzuki, 2005). It examines legal norms, doctrines, principles, and regulatory structures concerning carbon trading, environmental protection, financial-sector supervision, anti-money laundering, and criminal law (Mochtar & Hiariej, 2023). The article does not use empirical fieldwork, interviews, surveys, or psychological observation. Therefore, the method is not socio-legal or mixed-method research. The analysis is doctrinal and prescriptive: it evaluates existing legal instruments and constructs a normative model for future criminal law policy (Ibrahim, 2019).

The article applies four approaches. First, the statutory approach is used to examine Indonesian laws and regulations related to carbon economic value, carbon exchange supervision, environmental protection, financial-sector governance, anti-money laundering, and criminal law. Second, the conceptual approach is used to analyze *ultimum remedium*, *primum remedium*, *Gradatum Remedium*, corporate crime, carbon-market integrity, proportionality, and Pancasila justice. Third, the philosophical approach is used to examine the balance between legal certainty, investment protection, ecological justice, and public welfare. Fourth, a limited comparative approach is used to draw lessons from responsive regulation, environmental enforcement pyramids, and documented carbon-market fraud cases (Akbar, 2022; Poesoko, 2018).

The primary legal materials include the 1945 Constitution of the Republic of Indonesia; Law No. 32 of 2009 concerning Environmental Protection and Management (Republic of Indonesia, 2009); Law No. 16 of 2016 concerning the Ratification of the Paris Agreement (Republic of Indonesia, 2016); Law No. 8 of 2010 concerning the Prevention and Eradication of Money Laundering (Republic of Indonesia, 2010); Law No. 1 of 2023 concerning the Criminal Code (Republic of Indonesia, 2023a); Law No. 4 of 2023 concerning the Development and Strengthening of the Financial Sector (Republic of Indonesia, 2023b); regulations concerning Carbon Economic Value, including Presidential Regulation No. 110 of 2025 (Republic of Indonesia, 2021, 2025); Financial Services Authority Regulation No. 14 of 2023 concerning Carbon Trading through the Carbon Exchange (Financial Services Authority (OJK), 2023b); and OJK Circular Letter No. 12/SEOJK.04/2023 concerning the Organization of the Carbon Exchange (Financial Services Authority (OJK), 2023a).

Secondary legal materials consisted of peer-reviewed journal articles, academic books, institutional reports, legislation, judicial decisions, and documented cases concerning carbon trading, environmental criminal law, corporate crime, financial crime, anti-money laundering, greenwashing, climate governance, responsive regulation, and environmental enforcement. To ensure transparency and

comprehensiveness, the literature search was conducted using Scopus, Web of Science, HeinOnline, ScienceDirect, SpringerLink, Google Scholar, SSRN, and official institutional repositories, including those of the World Bank, OECD, United Nations Development Programme (UNDP), Integrity Council for the Voluntary Carbon Market (ICVCM), and the Indonesian Government. The primary search terms included "carbon trading", "carbon market regulation", "carbon market fraud", "environmental criminal law", "environmental enforcement", "sanction escalation", "responsive regulation", "smart regulation", "greenwashing", "money laundering", "carbon registry", "MRV integrity", and "climate justice".

The literature search focused primarily on publications issued between 2020 and 2025 in English and Indonesian to capture recent developments in carbon market governance and environmental law enforcement, while seminal theoretical works published prior to 2020 were selectively included where necessary to explain the conceptual foundations of responsive regulation, smart regulation, and environmental criminal law. The inclusion criteria comprised peer-reviewed journal articles, authoritative books, official reports, legislation, and judicial decisions that directly addressed carbon trading governance, regulatory enforcement, environmental compliance, or criminal liability. Materials that were duplicated, lacked academic credibility, were unrelated to carbon markets, or focused exclusively on technical or engineering aspects without legal relevance were excluded from the analysis.

The selected materials were analysed qualitatively through statutory, conceptual, comparative, and doctrinal approaches to identify converging and diverging legal perspectives. This analytical process enabled the identification of three principal research gaps: (1) the absence of a coherent doctrinal framework governing proportional sanction escalation in carbon trading; (2) the lack of normative legal criteria distinguishing administrative, civil, and criminal enforcement within carbon-market regulation; and (3) the unresolved theoretical tension between the *ultimum remedium* and *primum remedium* principles in addressing carbon-market offences (Soekanto & Mamudji, 2010). These three gaps provide the analytical foundation for constructing the *Gradatum Remedium* principle as the principal contribution of this study.

The legal materials are analyzed qualitatively through legal interpretation, legal systematization, legal argumentation, comparative doctrinal analysis, and conceptual construction (Susanti, 2019). The analysis proceeds in four stages. First, the article maps the legal position of carbon units and carbon trading in Indonesia. Second, it identifies the enforcement gap between administrative supervision and criminal enforcement. Third, it compares Indonesia's enforcement problem with doctrinal models and documented carbon-market fraud experience (Situmeang, 2023). Fourth, it constructs the *Gradatum Remedium* principle as a proportional enforcement framework based on Pancasila justice.

Result and Discussion

Legal Finding 1: Carbon Units Have a Dual Environmental-Financial Character

The first legal finding is that carbon units in Indonesia possess a dual environmental-financial legal character. On the one hand, they represent certified greenhouse gas emission reductions or emission allowances generated under climate-change mitigation mechanisms. On the other hand, they function as tradable financial instruments within the carbon market. This dual legal status is expressly recognized in Article 3(1) of Financial Services Authority Regulation (POJK) No. 14/POJK.04/2023, which provides that "Carbon Units constitute Securities (Efek)", thereby bringing carbon trading within the regulatory framework of Indonesia's capital market

and financial services sector.

Furthermore, Article 3(2)(a) and (b) of POJK No. 14/POJK.04/2023 requires that any Carbon Unit traded through the Carbon Exchange must first be registered (a) in the National Registry System for Climate Change Control (Sistem Registri Nasional Pengendalian Perubahan Iklim—SRN PPI and SRUK) and (b) with the Carbon Exchange Operator. This dual-registration requirement establishes that the legal validity of a Carbon Unit depends not only on compliance with market trading rules but also on the authenticity, traceability, and integrity of the underlying environmental records maintained within the national registry system. Consequently, defects in the monitoring, reporting and verification (MRV) process, registry records, or project documentation may affect not only environmental compliance but also the legal validity of the Carbon Unit as a tradable security, thereby creating potential administrative, civil, and criminal consequences.

This dual character creates a special enforcement challenge. A false or manipulated carbon unit may appear valid in market form if it has passed through documentation and registry processes. Yet, its environmental substance may be defective if the underlying emissions reduction, verification data, project documentation, or ownership claim is false. This is why carbon trading cannot be governed only as a technical environmental issue or only as a financial-market issue. It requires coordination between environmental supervision, financial-market supervision, registry governance, and criminal-law enforcement.

Legal Finding 2: Existing Rules Provide Supervision but Not a Carbon-Specific Criminal Escalation Framework

The second legal finding is that Indonesia already has several relevant legal instruments, but these instruments do not yet form an integrated criminal escalation framework for carbon-market violations. POJK No. 14 of 2023 gives OJK authority to regulate, license, supervise, and develop carbon trading through the carbon exchange. It also authorizes OJK to supervise the carbon exchange operator, supporting market infrastructure, service users, transactions, settlement, governance, risk management, consumer protection, and other parties, products, or activities related to carbon trading through the carbon exchange.

However, the sanction structure in POJK No. 14 of 2023 is primarily administrative. Article 33 provides administrative sanctions, including written warning, monetary fine, restriction of business activities, suspension of business activities, revocation of business license, cancellation of approval, and cancellation of registration. These sanctions are important for market discipline, but they do not clearly determine when carbon-market misconduct should be referred to criminal investigators, PPATK, prosecutors, or other competent authorities.

Therefore, the legal problem should not be characterised as a complete criminal law vacuum. Several existing statutory provisions may already be invoked depending on the factual circumstances of a carbon-market violation. Under Law No. 32 of 2009 on Environmental Protection and Management, environmental offences may be prosecuted under Articles 98 and 99, while Article 116 expressly recognises corporate criminal liability. Furthermore, Law No. 8 of 2010 on the Prevention and Eradication of Money Laundering provides criminal liability for laundering proceeds of crime through Articles 3, 4, and 5, with corporate criminal liability recognised under Article 6. Carbon-market misconduct may also fall within the financial regulatory framework established by Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (P2SK Law), which places carbon trading within Indonesia's financial-sector architecture under the supervision of the Financial Services Authority (OJK). In

addition, where carbon-market misconduct involves fraudulent representations, forged project documentation, falsified monitoring, reporting and verification (MRV) data, manipulated registry records, or deceptive transactions, the relevant provisions of the Indonesian Criminal Code (Law No. 1 of 2023) may also apply, including Article 391 on forgery of documents, Article 392 on forgery of authentic documents and securities, Article 394 on false statements in authentic deeds, and Article 492 on fraud.

Accordingly, the legal deficiency does not lie in the absence of substantive criminal provisions capable of addressing carbon-market misconduct. Rather, it lies in the absence of a carbon-market-specific sanction escalation framework that systematically determines when enforcement should remain administrative, when it should proceed to civil liability, and when it should culminate in criminal prosecution. The current legal framework does not clearly resolve four fundamental questions: (1) under what circumstances should a carbon-market violation remain subject to administrative sanctions; (2) when should it trigger civil liability, restitution, or compensation; (3) when should it be escalated into criminal prosecution; and (4) which competent authority should initiate the escalation process and coordinate environmental, financial, and criminal evidence among the relevant institutions. Consequently, although substantive criminal provisions exist across environmental, financial, anti-money laundering, and criminal legislation, their fragmented application creates legal uncertainty regarding proportional enforcement in carbon trading, thereby justifying the construction of the *Gradatum Remedium* principle.

Legal Finding 3: Comparative Experience Shows That Carbon Markets Are Vulnerable to Fraud and Financial Crime

Comparative experience supports the need for a clearer sanction-escalation model. The European Union Emissions Trading System (EU ETS) demonstrates that emissions trading can make a substantial contribution to greenhouse gas emission reductions when supported by robust institutional governance, effective monitoring, reporting and verification (MRV), and a credible compliance regime (Ammara et al., 2024; Ammara & others, n.d.; Bayer & Aklın, 2020; Journal of Al Azhar Indonesia, 2024). At the same time, European experience also illustrates that carbon markets are vulnerable to sophisticated forms of financial crime when regulatory coordination and market oversight are inadequate. During the early phases of the EU ETS, carousel value-added tax (VAT) fraud involving emission allowances resulted in estimated losses of approximately €5 billion across several member States, prompting coordinated enforcement actions by Europol and national authorities (Cahyani, 2024). These experiences demonstrate that the effectiveness of carbon markets depends not only on sound market design but also on an integrated legal framework capable of proportionately escalating enforcement from regulatory compliance measures to criminal prosecution where market manipulation, fraud, or other serious offences threaten market integrity.

INTERPOL has likewise identified carbon trading as an emerging area of transnational environmental and financial crime. In its Guide to Carbon Trading Crime, INTERPOL explains that carbon markets are particularly vulnerable to criminal exploitation because carbon credits are intangible assets whose legal validity depends upon complex regulatory, environmental, and financial verification systems (INTERPOL, 2013) Section 4, pp. 11–21). Specifically, the report identifies several recurring criminal risks, including fraudulent manipulation of emissions measurements to obtain excessive carbon credits, the sale of carbon credits that do not exist or belong to another party, false or misleading claims concerning environmental or financial benefits, exploitation of weak regulatory frameworks for money laundering and other

financial crimes, corruption and manipulation within verification processes, and cyber-attacks targeting national carbon registries and trading platforms (INTERPOL, 2013) Sections 4.1–4.9, pp. 11–21).

These risks are directly relevant to Indonesia because the legal validity of Carbon Units depends not only on market transactions but also on the integrity of monitoring, reporting and verification (MRV), the accuracy of the National Registry System (SRN-PPI and SRUK), the legitimacy of ownership claims, and the transparency of carbon-market transactions. Consequently, weaknesses at any stage of this regulatory chain may simultaneously compromise environmental integrity, market integrity, and legal certainty, thereby reinforcing the need for a structured sanction-escalation framework such as the *Gradatum Remedium* principle.

Recent enforcement in the United States voluntary carbon market further illustrates the same regulatory challenge. On 2 October 2024, the United States Attorney's Office for the Southern District of New York (SDNY) announced criminal charges against Kenneth Newcombe, former Chief Executive Officer of CQC Impact Investors LLC (formerly C-Quest Capital LLC), and Tridip Goswami, the company's former Head of Carbon and Sustainability Accounting, alleging their involvement in a multi-year scheme to submit false and misleading data in support of applications for carbon credits and to obtain more than US\$100 million in investment (Leong, 2021). On the same date, the Commodity Futures Trading Commission (CFTC) commenced a parallel civil enforcement action alleging that materially false and misleading information had been provided to carbon-credit registries and third-party verifiers in order to obtain carbon credits beyond those legitimately earned. These proceedings remain pending, and the allegations have not been adjudicated by a court. Nevertheless, the case demonstrates how alleged misconduct in carbon markets may simultaneously involve environmental misrepresentation, inaccurate monitoring, reporting and verification (MRV) data, fraudulent financial representations, and market integrity concerns. It further illustrates that effective enforcement requires close coordination among environmental regulators, carbon-credit registries, financial-market supervisors, and criminal law enforcement agencies in assessing technical and financial evidence.

Dialectical Tension: Administrative-First Enforcement and Its Counterargument

The administrative-first approach should not be rejected entirely. It has a strong doctrinal justification. In a developing carbon market, administrative supervision can protect legal certainty, reduce overcriminalization, encourage compliance, and give regulated actors an opportunity to correct technical mistakes. This is consistent with proportionality because not every reporting error, procedural delay, or documentation defect should be treated as a crime. In this sense, *ultimum remedium* remains important for minor violations that do not involve intent, serious harm, market manipulation, or financial-crime risk.

However, administrative-first enforcement becomes problematic when it is applied too rigidly. Carbon-market violations can involve technical documents that appear formally valid while concealing false emissions data, duplicate claims, fictitious projects, or manipulated verification. If all violations must pass through prolonged administrative procedures before criminal authorities can act, enforcement may become too slow to prevent asset transfer, market distortion, or loss of evidence. Therefore, the problem is not administrative enforcement itself. The problem is the absence of clear legal criteria for deciding when administrative handling is no longer sufficient.

Primum remedium also has limitations. A criminal-first

approach may create fear among legitimate market participants and discourage investment in carbon projects. It may also violate proportionality if technical negligence is treated the same as intentional fraud. This article therefore does not argue for replacing *ultimum remedium* with *primum remedium*. Instead, it proposes *Gradatum Remedium* as a dialectical synthesis. The model preserves administrative correction for minor violations while allowing criminal escalation when objective legal thresholds are met.

Doctrinal Novelty of *Gradatum Remedium*

The *Gradatum Remedium* Principle builds on, but differs from, existing graduated enforcement and responsive regulation doctrines. Responsive regulation uses an enforcement pyramid, beginning with persuasion and escalating toward stronger sanctions when regulated actors fail to comply. Smart regulation expands this idea by emphasizing regulatory pluralism and the involvement of state, market, and third-party actors. These models are useful, but they are general regulatory theories. They do not specifically address the evidentiary and institutional complexity of carbon trading (Prihatiningtyas et al., 2023).

Gradatum Remedium differs from existing models in three important respects. First, its escalation logic is not based solely on repeated non-compliance or the regulatory attitude of the regulated actor. Instead, it relies on objective legal indicators that are specific to carbon trading, including falsified monitoring, reporting and verification (MRV) documents, duplicate carbon-unit claims, manipulated registry data, fictitious mitigation activities, misleading environmental claims, and suspicious financial transactions. Second, it integrates environmental law and financial-sector law within a single sanction-escalation framework, recognising that Carbon Units simultaneously function as evidence of environmental performance and as tradable financial instruments.

Third, the five graduated enforcement levels are doctrinally derived from Pancasila Justice by translating its constitutional values into concrete criteria for determining the threshold, type, and intensity of legal intervention. Gradation I-administrative correction and compliance-reflects the principles of Just and Civilized Humanity and Social Justice by requiring proportionate, corrective, and non-punitive responses to minor violations, while ensuring due process and an opportunity to remedy non-compliance. Gradation II-civil liability and restitution-operationalises Social Justice by prioritising restoration, compensation, and recovery of ecological or economic losses where the violation causes identifiable harm but does not yet warrant criminal punishment. Gradation III-light criminal sanctions-derives from the principles of Humanity and Justice by requiring criminal intervention where culpability and the seriousness of the violation exceed the capacity of administrative or civil remedies, while maintaining proportionality and procedural safeguards (Margono, 2023). Gradation IV-severe criminal sanctions for fraudulent, organised, or environmentally harmful conduct-reflects Social Justice, Humanity, and the Unity of Indonesia by protecting environmental integrity, market integrity, and the public interest against conduct that produces substantial or systemic harm. Gradation V-additional sanctions, including asset confiscation, restoration obligations, corporate compliance measures, and, where legally justified, revocation of carbon-market rights-operationalises Social Justice and the principle of Democracy through accountable, evidence-based, and reviewable decisions aimed at preventing continued harm and restoring public interests. Across all five levels, the principle of Belief in One Almighty God provides the ethical foundation of honesty, good faith, and integrity in carbon-market conduct, while the five principles collectively require that enforcement escalation be based on objective indicators of culpability, harm,

Table 1. The Five Gradations of Gradatum Remedium

Gradation	Type of violation	Legal response	Triggering criteria
Gradation I: Administrative correction	Minor technical violation, late reporting, incomplete documentation, non-material registry error	Warning, correction order, administrative fine	No intent, no material harm, no market-integrity risk
Gradation II: Civil liability or restitution	Violation causing measurable economic or environmental loss	Compensation, restitution, restoration obligation	Quantifiable harm, identifiable injured party, recoverable loss
Gradation III: Light criminal sanction	Repeated negligence, reckless reporting, repeated failure to correct data, conduct that threatens market integrity	Criminal fine, corporate compliance order	Repetition, recklessness, significant compliance failure, market-integrity risk
Gradation IV: Severe criminal sanction	Intentional fraud, falsification, double counting, manipulation of MRV data, fictitious project claims	Imprisonment and fine, corporate criminal liability	Mens rea, deception, significant gain or loss, intentional manipulation
Gradation V: Additional sanctions	Systemic corporate crime, corruption, money laundering, organized manipulation, serious ecological-economic harm	License suspension, revocation of rights, asset recovery, restitution, corporate sanctions	Systemic impact, AML risk, corruption, organized conduct, threat to public interest

market-integrity risk, and the effectiveness of available remedies. Thus, Gradatum Remedium is not merely a hierarchy of sanctions, but a Pancasila-based proportionality framework in which each escalation level corresponds to the increasing seriousness, consequences, and public-interest implications of the violation.

Thus, the contribution of Gradatum Remedium is not the mere idea that sanctions can escalate. That idea already exists in regulatory theory. The contribution lies in constructing a carbon-market-specific escalation doctrine that determines when administrative correction, civil liability, criminal fines, imprisonment, corporate sanctions, asset recovery, and restitution should apply based on fault, harm, market-integrity risk, financial-crime linkage, and systemic ecological-economic impact.

The Five Gradations of Gradatum Remedium

The Gradatum Remedium model consists of five enforcement gradations (see [table 1](#)).

This model prevents both under-enforcement and overcriminalization. It prevents under-enforcement because serious carbon-market violations are not trapped indefinitely within administrative procedures. It prevents overcriminalization because minor technical violations remain subject to administrative correction rather than immediate criminal prosecution.

Operational Criteria and Procedural Safeguards

Criminal escalation should occur when objective indicators show that a violation is no longer merely technical or administrative. These indicators may include intentional falsification of emissions data; use of duplicate or previously claimed carbon units; manipulation of MRV documents; submission of false satellite imagery or project-location data; repeated misreporting after administrative warning; concealment of beneficial ownership; suspicious financial flows connected to carbon transactions; evidence of bribery, corruption, or money laundering; or organized use of carbon units to mislead buyers, investors, or regulators.

However, automatic escalation does not mean automatic punishment. It only means that the case moves from administrative examination to coordinated criminal assessment when threshold indicators are met. The accused party must still receive due-process protection, including notice of alleged violation, access to relevant evidence,

opportunity to respond, impartial investigation, presumption of innocence, and judicial review.

The evidentiary threshold should also be differentiated. Administrative correction may rely on documentary non-compliance or reporting inconsistency. Civil liability requires proof of measurable loss or damage. Criminal fines require proof of reckless or repeated non-compliance that creates market-integrity risk. Imprisonment and corporate criminal liability require stronger evidence of intent, deception, falsification, or unlawful gain. Additional sanctions require proof of systemic impact, organized conduct, corruption, money laundering, or serious ecological-economic harm.

Institutionally, escalation should involve coordination among the relevant environmental authority, OJK, PPATK, police investigators, prosecutors, and other competent authorities. OJK should remain central for exchange-related supervision. The environmental authority should assess MRV validity, project documentation, registry integrity, and environmental substance. PPATK should assess suspicious financial flows. Police investigators and prosecutors should handle criminal investigation and prosecution when the threshold for criminal escalation is met.

Compatibility with Indonesian Law

Gradatum Remedium can be integrated into Indonesian law without replacing existing legal instruments. POJK No. 14 of 2023 can remain the basis for carbon exchange supervision and administrative sanctions. Environmental law can remain relevant for environmental harm, restoration, and environmental criminal liability. Anti-money-laundering law can apply when carbon transactions are used to disguise proceeds of crime. Financial-sector law can apply when carbon-unit transactions affect market integrity. The Criminal Code can apply to general fraud, falsification, corporate crime, and related offenses.

The added value of Gradatum Remedium is to connect these legal instruments through an escalation framework. It does not create criminal punishment without legal basis. Rather, it provides a doctrinal structure for identifying which legal route should be activated based on the seriousness and character of the violation.

Conclusion

This article answers the first research question by showing that the criminal regulation of carbon trading in Indonesia is shaped by a tension between economic and ecological interests. On one hand, Indonesia needs legal certainty and administrative proportionality to support a developing carbon market. On the other hand, carbon trading involves intangible, registry-based, and financially tradable units that may be vulnerable to fraud, falsification, double counting, greenwashing, and money laundering. This creates a legal dilemma that cannot be solved by a rigid choice between *ultimum remedium* and *primum remedium*.

In response to the second research question, this article argues that the *Gradatum Remedium* principle is needed because Indonesia's current framework does not yet provide a carbon-market-specific escalation pathway. POJK No. 14 of 2023 provides supervision and administrative sanctions, but it does not by itself define when carbon-market violations should move into civil liability, criminal fines, imprisonment, corporate sanctions, asset recovery, or inter-agency criminal investigation. The need for *Gradatum Remedium* is therefore not based on a claim of total legal vacuum, but on the more precise problem of fragmented escalation.

In response to the third research question, this article constructs *Gradatum Remedium* as a five-level enforcement model consisting of administrative correction, civil liability or restitution, light criminal sanction, severe criminal sanction, and additional sanctions. Movement between these gradations should depend on objective criteria: fault, harm, repetition, market-integrity risk, economic gain, financial-crime linkage, and systemic ecological-economic impact. This model reflects Pancasila justice because it balances legal certainty, investment protection, ecological responsibility, social justice, and public welfare.

The article contributes to environmental criminal law by developing a carbon-market-specific enforcement doctrine. Its novelty does not lie merely in the idea of sanction escalation, which already exists in responsive regulation and enforcement pyramid literature. Its contribution lies in adapting escalation theory to the specific legal structure of carbon trading, where environmental integrity, registry validity, financial-market supervision, and criminal enforcement must be connected in one proportional framework.

Recommendations

Based on the normative legal analysis, this article proposes staged legal reform rather than immediate emergency regulation.

First, in the short term, OJK, the relevant environmental authority, PPATK, police investigators, and prosecutors should develop joint technical guidelines for identifying and escalating carbon-market violations. These guidelines should define indicators of fraud, falsification, double counting, manipulated MRV documents, suspicious financial flows, fictitious projects, and misleading environmental claims. This recommendation is proportionate to the article's normative method because it improves coordination without requiring immediate statutory overhaul.

Second, in the medium term, sectoral regulations on carbon trading should include a violation matrix that distinguishes administrative, civil, light criminal, severe criminal, and additional sanction categories. This matrix should identify responsible institutions, evidentiary thresholds, reporting obligations, referral procedures, and due-process safeguards.

Third, in the long term, legislative amendment may be considered if existing laws remain insufficient to address carbon-specific fraud, registry manipulation, double counting,

and money-laundering risks. The amendment may be placed in environmental law, financial-sector law, or a specific carbon-market statute. However, any amendment should avoid excessive criminalization and should preserve legal certainty for legitimate carbon-market participants.

A Government Regulation in Lieu of Law (Perppu) should not be the primary recommendation. It should only be considered if the government can demonstrate constitutional urgency, a concrete legal vacuum, and the inadequacy of ordinary legislative procedures. Without such justification, a Perppu may create legal uncertainty and weaken the proportionality that *Gradatum Remedium* seeks to protect.

Author contributions

All authors are senior lecturers at the Faculty of Law, Universitas Pancasila, Jakarta, Indonesia, and contributed to the development of this manuscript based on their academic expertise in Indonesian law, criminal law policy, environmental law, and carbon trading regulation.

Dr. Silverius Y. Soeharso, M.M., MPsi., M.H., contributed to the conceptualization of the study, formulation of the main research problem, development of the theoretical framework on *Ultimum remedium*, *Primum remedium*, and the *Gradatum Remedium* principle, and preparation of the initial manuscript draft.

Prof. Dr. Agus Surono, S.H., M.H., contributed to the analysis of Indonesian legal instruments, including regulations on carbon economic value, environmental law, financial-sector supervision, and criminal law. Agus also supported the construction of the normative legal argument and reviewed the consistency of the manuscript with Indonesian legal doctrine.

Prof. Dr. Adnan Hamid, S.H., M.H., M.M., contributed to the literature review, comparative legal analysis, development of the discussion on carbon-market enforcement risks, and refinement of the manuscript structure. Prof. Adnan Hamid, contributed to strengthening the relationship between the article's research gap, findings, and policy recommendations, as well as reviewing the manuscript for conceptual consistency and legal argumentation.

The authors extend special appreciation to Dr. Maslihat Nur Hidayati, S.H. M.H., for his valuable advice, critical insights, and role as a constructive discussion partner throughout the development of this manuscript. His input helped sharpen the authors' reflections on the legal, conceptual, and policy dimensions of carbon trading regulation and the *Gradatum Remedium* Principle.

All authors contributed to revising the manuscript, reviewing the final version, and approving the manuscript for submission. All authors agree to be accountable for the accuracy, integrity, and academic quality of the work.

Funding

This research was funded independently using the authors' own resources. The study was not conducted under any research contract, commissioned project, or externally funded grant. No funding agency, sponsor, or external institution influenced the design of the research, selection of legal materials, analysis, interpretation, conclusions, or preparation of the manuscript.

Acknowledgements

The authors express their sincere appreciation to the Doctorate Program in Law, Faculty of Law, Universitas Pancasila, Jakarta, Indonesia, for providing an academic

environment that supports legal research and scholarly discussion. The authors also acknowledge the contribution of previous academic works, legal materials, institutional documents, and public regulatory sources that supported the development of this article.

The authors are grateful for the constructive comments

and suggestions provided during the manuscript review process. These inputs helped improve the clarity of the research gap, the consistency of the methodology, the operationalization of the Gradatum Remedium principle, and the overall coherence of the manuscript. Any remaining errors or shortcomings are the sole responsibility of the authors.

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