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## **Environmental Law Updates for Combating Urban Air Pollution from Transportation Emissions Based on Green Constitution Principles**

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### **ABSTRACT**

This study aims to analyze and reconstruct the law governing the control of urban air pollution from transportation emissions in Indonesia, based on Green Constitution principles. The main problem lies in the weakness of normative regulations and the low effectiveness of law enforcement, despite the constitutional guarantee of the right to a good and healthy environment in Article 28H paragraph (1) and the principle of sustainable development in Article 33 paragraph (4) of the 1945 Constitution of the Republic of Indonesia. This study uses a normative juridical method with a legislative and conceptual approach, analyzing Law Number 32 of 2009 concerning Environmental Protection and Management and its amendments in Law Number 6 of 2023, as well as regulations related to motor vehicle emissions. The results of the study indicate a gap between legal norms and their implementation, characterized by regulatory fragmentation, weak sanctions, and low public compliance with emission tests. Therefore, integrative and transformational legal reform is needed by strengthening state and corporate responsibility, reforming the sanctions system, implementing environmental economic instruments, and utilizing technology for emissions monitoring. This reform is expected to achieve effective and ecologically just environmental protection in accordance with the principles of the Green Constitution.

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### **INTRODUCTION**

The empirical condition of urban air pollution in Indonesia shows an increasingly worrying trend, particularly in large cities such as Jakarta, Surabaya, and Bandung, which consistently record concentrations of fine particulate matter (PM<sub>2.5</sub>), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>) above safe thresholds. (Global Scientists, 2023) When compared to the World Health Organization (WHO) air quality guidelines, the annual PM<sub>2.5</sub> threshold of 5 µg/m<sup>3</sup> is often exceeded many times over. (World Health Organization, 2021) The increasing number of motorized vehicles, both motorcycles and private cars, is a dominant factor driving the decline in air quality, along with uncontrolled urbanization and traffic congestion, which exacerbate the accumulation of pollutants in the urban atmosphere. (Pangestu, 2024) This phenomenon demonstrates the close relationship between urban economic growth, public mobility, and environmental degradation, ultimately giving rise to complex legal issues due to the involvement of various policy sectors.

In terms of pollution sources, the transportation sector has proven to be a major contributor, particularly in urban areas, compared to the industrial sector. (Dewi, 2022) Motorized vehicle emissions produce various hazardous pollutants, including PM<sub>2.5</sub>, carbon

monoxide (CO), nitrogen oxides (NO<sub>x</sub>), and hydrocarbons (HC), most of which originate from private vehicles, which far outnumber public transportation. (Yusrianti, 2015) Furthermore, the presence of older vehicles with inferior technology and the use of low-quality fuel exacerbate this condition. The phenomenon of mass motorization in Indonesia reflects the failure of effective public transportation policies, leaving people dependent on private vehicles. (Susilo, 2017) From an environmental law perspective, this situation indicates that emissions control has not been regulated comprehensively and in an integrated manner, thereby creating an urgent need for legal reform to address the complexity of these pollution sources.

The impact of air pollution extends beyond environmental concerns and significantly affects public health and quality of life. Long-term exposure to air pollutants has been shown to cause various diseases such as acute respiratory infections (ARI), lung cancer, and cardiovascular disorders. (Candrasari, 2023) The economic burden caused by health costs and lost productivity is also significant, especially for vulnerable groups such as children and the elderly. (Siregar, 2020) Furthermore, air pollution contributes to environmental damage such as acid rain and microclimate change in urban areas. (Sulistiani, 2024) From a legal perspective, this condition confirms a violation of the right to a good and healthy environment, as guaranteed in Article 28H, paragraph (1), of the 1945 Constitution of the Republic of Indonesia, and the state has a constitutional obligation to carry out effective legal intervention. (Tinambunan, 2022)

Normatively, Indonesia already has a relatively comprehensive environmental legal framework, including Law Number 32 of 2009 concerning Environmental Protection and Management, which, in Article 3, affirms the purpose of environmental protection to ensure human safety, health, and life. (Dewi D.K., 2018) Furthermore, amendments to Law Number 6 of 2023 concerning the Stipulation of the Job Creation Government Regulation, which replaced Law (Perppu) with Law, have shifted the environmental licensing approach to a risk-based one. Regarding vehicle emissions, there are also regulations regarding emission quality standards, emission testing policies, and the development of electric vehicles. (Ruhayat, 2022) However, these regulations are still sectoral and have not been fully integrated between environmental Law and transportation law. The roles of the central and regional governments are also often unsynchronized, resulting in ineffective implementation of air pollution control policies (Liu et al., 2016; Song et al., 2020).

The main weaknesses in regulating transportation emissions lie in the normative and implementation aspects. Normatively, there is still a lack of clarity in the formulation of obligations and sanctions for emission violations, while in implementation, there is a significant gap in law enforcement. (Devano, 2024) The lack of deterrent sanctions and weak oversight has led to low public compliance with mandatory emissions testing. Regulatory fragmentation between the environmental and transportation sectors further exacerbates this situation, due to the lack of an integrated approach to pollution control. Furthermore, the practice of moral hazard in vehicle testing and the limited capacity of law enforcement officers indicate that the current administrative approach has not deterred, necessitating more structural and systemic reforms. (Rahma, 2025)

The urgency of this research is underscored by several converging factors. Jakarta consistently ranks among the world's most polluted cities, with IQAir listing it as having the worst air quality in Southeast Asia in 2023. The concentration of PM<sub>2.5</sub> in Jakarta often

exceeds WHO guidelines by 5-10 times. The Indonesian government's target of net zero emissions by 2060 requires significant reductions in transportation sector emissions, which currently contribute approximately 25-30% of total urban air pollution. The Constitutional Court has issued several decisions affirming the right to a healthy environment (e.g., Decision No. 34/PUU-XI/2013 on judicial review of environmental law), yet implementation remains weak. Public lawsuits against the government for failure to control air pollution (e.g., citizens' lawsuit against the President and Governor of DKI Jakarta in 2020-2021) demonstrate growing public demand for effective legal intervention. Without urgent legal reform, the health and economic costs of air pollution will continue to escalate, disproportionately affecting vulnerable urban populations.

From a theoretical and philosophical framework, the concept of a Green Constitution provides an important foundation for environmental law reform in Indonesia. This principle places the environment at the heart of the constitution, as reflected in Articles 28H (1) and 33 (4) of the 1945 Constitution, which affirm the principles of sustainable and environmentally conscious development. (Chandra, 2024) However, there is a significant gap between these constitutional principles and the reality of regulation and implementation, which remains dominated by an economic rather than an ecological approach. Therefore, reforming environmental Law to control transportation emissions is a necessity, prioritising the integration of Green Constitution principles, strengthening state and corporate responsibility, reforming the sanctions system, and utilising technology for oversight. This approach aims not only to increase law enforcement effectiveness but also to achieve ecological justice and the sustainable protection of citizens' constitutional rights.

## **METHOD**

This research used a normative juridical research method that focuses on the study of legal norms as a system of rules applicable in legislation, positioning Law as an autonomous and prescriptive normative structure. The approaches used include a statute approach and a conceptual approach. The legislative approach is carried out by examining various relevant regulations, starting from the 1945 Constitution of the Republic of Indonesia, especially Article 28H paragraph (1) and Article 33 paragraph (4), to laws and regulations in the environmental and transportation sectors such as Law Number 32 of 2009 concerning Environmental Protection and Management and Law Number 6 of 2023 concerning the Determination of the Perppu on Job Creation into Law, including implementing regulations related to emission quality standards and air pollution control. Meanwhile, the conceptual approach involves examining emerging legal doctrines, principles, and theories, particularly those related to the Green Constitution, sustainable development, ecological justice, and state responsibility for environmental protection. The legal materials used consist of primary, secondary, and tertiary sources, which are analyzed qualitatively using systematic, grammatical, and teleological legal interpretation techniques to develop comprehensive legal arguments for formulating environmental Law updates to control air pollution from transportation emissions.

## **RESULT AND DISCUSSION**

### **Legal Regulations for Controlling Air Pollution from Transportation Emissions in the Indonesian Legal System**

Legal regulations for controlling air pollution from transportation emissions in the Indonesian legal system are rooted in a strong constitutional foundation, namely the 1945 Constitution of the Republic of Indonesia. Article 28H paragraph (1) affirms that everyone has the right to a good and healthy environment, which implicitly places the state as the party obligated to guarantee the fulfilment of this right through effective legal instruments. Furthermore, Article 33, paragraph (4) of the 1945 Constitution emphasizes that the national economy is organized based on sustainable and environmentally conscious principles, indicating a constitutional obligation to balance economic development and environmental protection. (Fithori, 2024) Thus, controlling air pollution, including that from transportation emissions, is not merely a sectoral policy but a constitutional mandate that must be realized through comprehensive and integrated regulations.

At the legal level, the main provisions are contained in Law Number 32 of 2009 on Environmental Protection and Management, which serves as the *lex generalis* of Indonesia's environmental legal regime. Article 3 letters a and b emphasize that environmental protection and management aim to protect the territory of the Unitary State of the Republic of Indonesia from environmental pollution and/or damage and to guarantee human safety, health, and life. Article 20 establishes environmental quality standards as the primary instrument for pollution control, including ambient air quality standards and emissions standards. In addition, Article 69 paragraph (1) letter a expressly prohibits anyone from carrying out actions that result in environmental pollution. This provision provides a strong legal basis for controlling motor vehicle emissions as a source of air pollution, while also opening up space for law enforcement both administratively, civilly, and criminally. (Maula, 2024)

This regulatory strengthening underwent significant changes through Law Number 6 of 2023, which converted Government Regulation Number 2 of 2022 concerning Job Creation into Law and introduced a risk-based business licensing approach. Within this framework, environmental approval replaces environmental permits as a control instrument, further regulated by amendments to Articles 22 and 36 of Law Number 32 of 2009. While this approach is intended to increase investment efficiency, there is criticism that simplifying licensing could weaken the preventive function of environmental protection. In the context of transportation emissions, this change has implications for the supervision and control of activities that contribute to air pollution, requiring caution to ensure that deregulation does not reduce pre-existing environmental protection standards. (Panggabean, 2023)

In addition to this general framework, technical regulations related to motor vehicle emissions are set out in various implementing regulations, including Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management, which establishes emission quality standards and air pollution control instruments. Furthermore, Law Number 22 of 2009 concerning Road Traffic and Transportation also provides the legal basis for vehicles' obligations to meet technical and roadworthiness requirements, including emission standards as stipulated in Article 48 paragraph (3). Motor vehicle emission testing policies and the development of electric vehicles as part of sustainable transportation are also important instruments in reducing air pollution.

However, these regulations are scattered across various sectoral regulations that have not been fully integrated into a single comprehensive legal framework. (Murdomo, 2021)

From an environmental legal perspective, existing regulations have adopted several fundamental principles, such as the precautionary principle, the prevention principle, and the polluter pays principle, as reflected in the General Explanation and various provisions of Law 32 of 2009. However, the implementation of these principles in controlling transportation emissions remains suboptimal. For example, the polluter-pays principle has not been fully implemented for motor vehicle owners who emit excessive amounts of pollution. In contrast, the precautionary principle has not been firmly internalized in transportation policies, which still tend to favour private vehicles. This indicates a gap between ideal legal norms and policy practices. (Tatawu, 2024)

Although Indonesia has a relatively comprehensive legal framework for controlling air pollution caused by transportation emissions, fundamental issues remain regarding the integration and effectiveness of its regulations. Regulatory fragmentation between the environmental and transportation sectors, weak coordination between the central and regional governments, and the suboptimal application of environmental law principles are key challenges to the implementation of these laws. Therefore, efforts are needed to harmonize and reconstruct the law, integrating various existing instruments into a more cohesive and responsive system to the challenges of urban air pollution, so that the goals of environmental protection, as mandated by the constitution, can be achieved effectively and sustainably.

### **Normative Weaknesses and Problems of Law Enforcement in Urban Transportation Emission Control**

Normative weaknesses in Indonesia's urban transportation emission control are fundamentally rooted in the unclear formulation of legal obligations across various laws and regulations. Although Law Number 32 of 2009 concerning Environmental Protection and Management stipulates a prohibition on pollution in Article 69 paragraph (1) letter a, this norm is still general in nature. It does not specifically define the limits of individual or corporate responsibility regarding motor vehicle emissions. Similarly, the provisions of Article 20 on environmental quality standards have not been fully implemented, and there are no clear operational mechanisms for monitoring individual vehicle emissions. Consequently, a normative gap exists at the implementation level, making it difficult to enforce the law against emissions violations in the urban transportation sector.

Normative weaknesses are also evident in the provisions on sanctions, which do not provide an adequate deterrent effect. In Law Number 32 of 2009, administrative sanctions are regulated in Article 76, while criminal sanctions are regulated in Articles 98 to 103. However, criminal sanctions for vehicle emissions violations are rarely imposed because proving a direct causal relationship between a vehicle and air pollution is difficult. On the other hand, Law Number 22 of 2009 concerning Traffic and Road Transportation, specifically Article 48 paragraph (3), does regulate the technical and roadworthiness requirements of vehicles, including emissions, but is not accompanied by strong and consistent sanctions in practice. This indicates a normative weakness in the design of sanctions that are not adaptive to the cumulative and diffuse nature of air pollution.

Empirically, this weakness is reflected in the low level of public compliance with mandatory motor vehicle emission tests. In several large cities, such as Jakarta and Surabaya,

the implemented emission testing policies have not yielded significant results due to limited public awareness of the law and weak oversight. Many vehicles continue to operate without meeting emission standards, even after being declared to have failed the emission test. This phenomenon reveals a gap between applicable legal norms and social reality (law on the books vs. law in action), indicating that existing regulations have not internalized compliance as part of the community's legal culture.

The problem of law enforcement is also exacerbated by the practice of moral hazard in the implementation of vehicle emission tests. In practice, there have been indications of manipulation of emission test results or the granting of passes without adequate inspection, reflecting the weak integrity of the oversight system. Furthermore, limited institutional capacity, both in terms of the number and competence of law enforcement officers, poses a serious obstacle to the implementation of air pollution control policies. The provisions of Article 63 of Law 32 of 2009, which regulate the division of authority between the central and regional governments, have not been accompanied by effective coordination, leading to frequent overlap or even a lack of oversight in the field.

The dominance of administrative approaches in environmental law enforcement is also a factor contributing to the low effectiveness of transportation emission control. Administrative sanctions such as warnings, government coercion, or administrative fines, as stipulated in Article 76 of Law 32 of 2009, tend not to provide a strong deterrent effect, especially when compared to criminal or civil approaches, which have greater coercive power. However, criminal approaches are often not used due to their perceived inefficiency and difficulty in proving, while civil lawsuits are rarely filed due to their high cost and time requirements. This situation indicates an imbalance in the use of law enforcement instruments that should be complementary.

Compared with practices in other countries, such as several European countries and Japan, which have implemented strict emission standards, technology-based monitoring systems, and sanctions, Indonesia still lags in terms of institutional design and legal policy for air pollution control. These countries rely not only on regulations but also on building integrated systems that integrate transportation, environmental, and law enforcement policies. Therefore, the weaknesses in transportation emission control in Indonesia lie not only in normative aspects but also in empirical issues, including low compliance, weak oversight, and suboptimal institutional design. This underscores the need for legal reform that not only improves norms but also strengthens the legal structure and culture in urban air pollution control.

### **Reconstruction and Reform of Air Pollution Control Laws Based on the Principles of the Green Constitution**

Reconstruction and reform of air pollution control laws, grounded in the principles of the Green Constitution, must strengthen the philosophical and constitutional foundation that a good and healthy environment is a human right guaranteed by the state. This is explicitly stipulated in Article 28H, paragraph (1), of the 1945 Constitution of the Republic of Indonesia, and reinforced in Article 33, paragraph (4), which emphasizes the principle of sustainable, environmentally conscious development. In this context, the state plays not only a regulatory role but also a duty-bearer, obligated to ensure air quality protection through concrete, measurable policies actively. Therefore, legal reform must be directed at strengthening these

constitutional norms into operational regulations, including by revising Law Number 32 of 2009 to explicitly include transportation emission control as part of the state's imperative obligations.

Concretely, legal reconstruction requires integrating ecological principles into all national transportation policies. This can be achieved through harmonization of Law Number 22 of 2009 concerning Road Traffic and Transportation with Law Number 32 of 2009, so that emission standards are no longer treated merely as technical matters, but as legal obligations with clear sanctioning consequences. Concrete actions that can be taken include mandating emissions testing as a requirement for vehicle registration (STNK) renewals nationwide and integrating emissions test data with the digital-based motor vehicle registration system. Furthermore, the government needs to establish low-emission zones in major cities that prohibit high-emission vehicles from operating in certain areas, as a form of implementing the precautionary principle in environmental law.

Strengthening state and corporate responsibility is also a crucial element in this legal reform. Article 69, paragraph (1) of Law 32 of 2009 prohibits everyone from engaging in actions that cause environmental pollution, so responsibility falls not only on individual vehicle users but also on vehicle manufacturers and fuel suppliers. Concrete actions include implementing an extended producer responsibility (EPR) scheme for motor vehicle manufacturers to ensure their products meet emission standards throughout their life cycles. Furthermore, the government can require fuel companies to widely provide low-emission fuels and impose strict sanctions on corporations that fail to meet environmental standards. In this regard, the state must act as an active supervisor, ensuring compliance by all actors in the transportation system.

Reforming the sanctions system is also a crucial part of legal reconstruction. To date, administrative sanctions as stipulated in Article 76 of Law 32 of 2009 have not provided an optimal deterrent effect. Therefore, strengthening sanctions through a combination of administrative, criminal, and economic approaches is necessary. Concrete actions that can be taken include implementing progressive fines for vehicles that fail emissions tests, revoking operating permits for commercial vehicles that violate regulations, and imposing criminal sanctions for serious violations with widespread impacts. Furthermore, an emissions-based environmental tax could be an effective disincentive to reduce the use of high-emission vehicles.

In the digital era, legal reforms must also accommodate the use of technology as a control instrument. The development of technology-based regulations (smart regulations) can be achieved through a real-time emissions monitoring system using air sensors, integrated with the electronic ticketing system (ETLE). Another concrete action is the development of a national data-driven platform that integrates air quality information, vehicle data, and emissions test results, enabling evidence-based policymaking. Furthermore, the government can encourage the use of electric vehicles by providing fiscal and non-fiscal incentives and accelerating the development of supporting infrastructure, such as public electric vehicle charging stations (SPKLU).

Legal reforms based on the Green Constitution must prioritize ecological justice and public participation. This aligns with the participatory principle in Article 65 of Law 32 of 2009, which grants the public the right to participate in environmental protection. Concrete

actions include providing transparent public access to air quality data, involving the public in the formulation of transportation policies, and establishing an effective complaint mechanism for emissions violations. Thus, legal reform does not stop at changing norms, but also encourages systemic transformation involving all stakeholders, thereby bridging the gap between constitutional norms and the empirical reality of controlling urban air pollution.

## CONCLUSION

The conclusion of this study indicates that the control of urban air pollution due to transportation emissions in Indonesia has a fairly strong legal basis, both in the constitution through Article 28H paragraph (1) and Article 33 paragraph (4) of the 1945 Constitution of the Republic of Indonesia, and in the law through Law Number 32 of 2009 concerning Environmental Protection and Management and its amendments in Law Number 6 of 2023. However, substantively, there are still weaknesses in the formulation of norms, particularly regarding standards of obligation and the effectiveness of sanctions. Empirically, there are serious gaps in law enforcement, characterized by low compliance with emission testing requirements, weak oversight, and fragmented regulations across sectors. This situation indicates that the existing legal system is not yet fully capable of effectively protecting the right to a good and healthy environment. Therefore, legal reform grounded in the principles of the Green Constitution is an urgent need to integrate ecological values into the overall legal system and national transportation policy. The recommendations in this study emphasize the importance of concrete, measurable steps in reconstructing transportation emission control laws. The government needs to harmonize regulations across the environmental and transportation sectors and strengthen legal norms by revising laws and regulations to make mandatory emissions testing a binding administrative requirement, accompanied by a stricter, more enforceable sanction system. Furthermore, institutional strengthening and technology-based oversight through an integrated digital system are needed to enhance law enforcement effectiveness. The government also needs to encourage the implementation of economic instruments such as emission-based taxes and incentives for environmentally friendly vehicles, and ensure public participation in air quality monitoring. Thus, legal reform should not only be normative but also implemented and transformational to achieve ecological justice and environmental sustainability for current and future generations.

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