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## Implementation of Carbon Tax as an Effort to Improve The Economy and Preserve The Environment

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**Abstract:** Climate change has become a global challenge that needs to be addressed together. Indonesia is one of the countries that is vulnerable to climate change. The decline in environmental quality that has an impact on natural disasters can be detrimental to various parties. In Indonesia, Law Number 32 of 2009 concerning Protection and Management of the Environment has been enacted, which contains systematic and integrated efforts to preserve the environment and as an effort to prevent pollution and/or environmental damage. In addition, regulations have also been issued on carbon taxes in Article 13 of Law Number 7 of 2021 concerning Harmonization of Tax Regulations. The main objective of the carbon tax is to change the behavior of economic actors to switch to low-carbon economic activities, but the implementation of the carbon tax is currently still being postponed. The research methodology is a literature review, in the form of normative legal, qualitative. The data presented are secondary data obtained from various literature sources. This study concludes that in order to reduce the worsening environmental damage and also increase revenue from the Tax sector, it is necessary to implement a Carbon Tax, but the Law that has been issued has been postponed, with various considerations, so that the carbon tax can be implemented and run effectively, there is a need for improved regulations that not only function as economic tools, but also as drivers of behavioral change and technological development to achieve sustainability goals.

**Keyword:** Carbon Tax, Environment, Greenhouse Effect, Global Warming

### INTRODUCTION

Global warming driven by greenhouse gas emissions has triggered a wide range of extreme phenomena, including heatwaves, droughts, and wildfires (Mukono, 2020). Heatwaves, characterized by temperatures that remain far above normal over a certain period, are occurring with increasing frequency and pose serious threats to public health, agricultural productivity, and ecosystem stability (Solomon, 2023). According to reports, the global average temperature is projected to rise by approximately 2.0°C to 4.9°C by the end of this century, in line with projections issued by the Intergovernmental Panel on Climate Change. Data further indicate a substantial increase in both the frequency and duration of heatwaves across various regions of the world.

Climate change has caused droughts to become an increasingly frequent phenomenon (Pinontoan, Odi R., Oksfrian J. Sumampouw, 2022). Research indicates that shifts in rainfall patterns associated with global warming have contributed to the growing occurrence of droughts across many parts of the world (Faradiba, 2023). Human activities, particularly carbon dioxide (CO<sub>2</sub>) emissions and deforestation, also play a significant role in reducing soil moisture, resulting in droughts that are more prolonged and severe (Rahimi, 2021). Rising global temperatures can diminish soil moisture, decrease agricultural productivity, and potentially trigger wider food crises (Cohen, Itay, Sara I Zandalinas, Clayton Huck, Felix Fritschi, 2020). Sudan, for example, has experienced decades of drought, changing rainfall patterns, and prolonged flooding. Approximately 15 million people in the country are suffering from severe hunger, with children and pregnant women among the most vulnerable groups. In 2022, continuous flooding severely disrupted the planting season. These conditions represent the consequences of ecosystem degradation that humanity must ultimately bear.

Forest fires are also occurring with increasing frequency as a consequence of climate change, particularly in regions that are already dry. High temperatures caused by heatwaves, combined with reduced humidity, create ideal conditions for the outbreak of wildfires. Rising temperatures and declining rainfall significantly elevate the risk of forest fires, leading to ecosystem destruction and increased greenhouse gas emissions from the burning of organic matter within forests (Sulkan, 2020). Data indicate that wildfire hotspots have intensified alongside climate change, with impacts being felt across various regions, including subarctic areas that are experiencing rapid warming (Rieksta, Jolanta, Tao Li, Anders Michelsen, 2021). In Indonesia, records show that as of 7 October 2024, the Indonesian National Police had handled 2,408 disaster reports, with fires representing the most frequent type of disaster, accounting for 935 cases or approximately 38.82% of all reported disasters nationwide.

Overall, the interaction between heatwaves, droughts, and forest fires illustrates the complex nature of climate change impacts. It is therefore essential to understand and mitigate these effects through sustainable and science-based approaches in order to reduce their adverse consequences for both the environment and society. As industrialization continues to expand and develop, the risk of environmental degradation also increases, making strict environmental regulations indispensable for environmental protection. More than three decades ago, countries around the world agreed to address climate change through the United Nations Framework Convention on Climate Change, which was adopted by the United Nations in 1992. Its primary objective is to stabilize greenhouse gas concentrations in the atmosphere. This commitment is implemented through Nationally Determined Contributions (NDCs), under which every country, including Indonesia, is encouraged to contribute to reducing the impacts of climate change.

In the context of environmental policy, carbon taxation has emerged as an important instrument for reducing greenhouse gas emissions (Barus, Eykel Bryken, 2020). This tax is designed to provide incentives for companies and individuals to reduce their reliance on fossil fuels, which significantly contribute to carbon dioxide (CO<sub>2</sub>) emissions and global warming (Mehmet, 2020). By imposing charges on carbon emissions, carbon taxes encourage the adoption of clean technologies, improved energy efficiency, and greater investment in renewable energy sources (Putri, Rumanintya L, Desak N S Werastuti, Ni W Rustiarini, Agung Sutoto, Eko Wahyono, Budi Wardono, Armen Zulham, 2024).

Research indicates that carbon taxation can significantly reduce greenhouse gas emissions. For instance, a well-designed carbon tax system has the potential to reduce global emissions by up to 21.5% (Liu, Boming, Jin Dong, Byungkwon Park, Jianming Lian, 2024). Furthermore, such policies can accelerate the transition toward a sustainable economy by encouraging behavioral changes within industrial and household sectors, while also

promoting innovation in environmentally friendly technologies (Xue, Huihui, Shenxi Lin, Wanting Wang, Kunao Fu, 2022).

The success of carbon taxation largely depends on effective design and implementation. It is essential to balance economic and environmental considerations while ensuring that such policies do not impose excessive burdens on society (Mehmet, 2020). Transparent reporting and verification mechanisms, together with the active involvement of stakeholders, are also necessary to enhance the effectiveness of carbon tax policies (Maysyuk, 2021).

Therefore, carbon taxation constitutes a strategic policy instrument for reducing greenhouse gas emissions. When implemented appropriately, this policy not only contributes to emission reduction but also promotes the transformation toward a more sustainable economy. Consequently, appropriate regulatory frameworks are required to ensure its effectiveness.

Sweden became a pioneer in the implementation of carbon taxation by introducing a carbon tax in 1991. This policy successfully reduced greenhouse gas emissions by approximately 27% between 1990 and 2016, while the country's economy continued to grow (Barus, Eykel B, 2022). Finland also adopted a similar policy aimed at reducing dependence on fossil fuels and promoting renewable energy development. In Indonesia, carbon taxation has been regulated under Article 13 of Law Number 7 of 2021 concerning the Harmonization of Tax Regulations, which establishes a minimum tariff of IDR 30 per kilogram of CO<sub>2</sub> equivalent. However, its implementation has been delayed pending the development of a carbon market mechanism, despite the fact that many other countries have already implemented similar policies effectively.

Based on the foregoing discussion, the author intends to conduct research focusing on two principal issues: first, the efforts toward environmental preservation through the implementation of carbon taxation in Indonesia; and second, the issue of legal certainty regarding the implementation of Article 13 of Law Number 7 of 2021 concerning the Harmonization of Tax Regulations.

## METHOD

This research employs a literature review approach, specifically a normative juridical and qualitative method (Ali, 2021). It is conducted through the examination of relevant legal materials and statutory regulations, including an analysis of the implementation of carbon taxation based on the provisions stipulated in Law Number 7 of 2021 concerning the Harmonization of Tax Regulations, as well as Law Number 32 of 2009 on Environmental Protection and Management. The data used in this study consists of secondary data obtained from online sources, national seminar materials, and both national and international academic journals, in order to provide a conceptual analysis of carbon tax implementation in Indonesia. Subsequently, the collected data will be analyzed in detail to explain the implementation of carbon taxation in Indonesia.

## RESULT AND DISCUSSION

### **Environmental Conservation Efforts through the Implementation of Carbon Taxation in Indonesia**

Environmental conservation is an obligation for every citizen without exception. When the environment is well preserved, the sustainability of human life is also better secured (Aulia, Muhammad Reza, Qhishthina Atikah, Hartini Hartini, Sri Rosmiati Sani, 2025). One of the efforts of the Government of Indonesia in promoting environmental protection is the enactment of Law Number 32 of 2009 concerning Environmental Protection and Management.

“Environmental protection and management refers to systematic and integrated efforts undertaken to preserve environmental functions and to prevent environmental pollution and/or environmental damage, which include planning, utilization, control, maintenance, supervision, and law enforcement.” The objectives of environmental protection and management are set out in Article 3 of Law Number 32 of 2009, namely:

- a. To protect the territory of the Republic of Indonesia from environmental pollution and/or environmental damage.
- b. To ensure human safety, health, and life.
- c. To guarantee the continuity of life for living organisms and the preservation of ecosystems.
- d. To maintain the sustainability of environmental functions.
- e. To achieve harmony, balance, and environmental equilibrium.
- f. To ensure justice for both present and future generations.
- g. To guarantee the fulfillment and protection of the right to a healthy environment as part of human rights.
- h. To control the utilization of natural resources in a wise and sustainable manner.
- i. To realize sustainable development.
- j. To anticipate global environmental issues.

In its implementation, Article 1 paragraph (2) of Law Number 32 of 2009 divides environmental protection and management efforts into six components, namely planning, utilization, control, maintenance, supervision, and law enforcement.

According to Hukum Online, a carbon tax is a tax imposed on products that generate carbon emissions, such as fossil fuels. In this context, carbon emissions are not limited to carbon dioxide (CO<sub>2</sub>), but also include methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and other gases containing fluorine (F).

Based on Law Number 7 of 2021 concerning the Harmonization of Tax Regulations (HPP), Article 13 regulates several key provisions regarding carbon taxation, including:

1. Carbon tax is imposed on carbon emissions that have a negative impact on the environment.
2. This policy takes into account the carbon market roadmap and/or carbon tax roadmap, which includes strategies for reducing carbon emissions, priority sector targets, alignment with the development of new and renewable energy, and harmonization with other policies.
3. It is based on the principles of fairness and affordability, while considering the business climate and the impact on low-income communities.
4. The tax rate is set equal to or higher than the carbon price in the carbon market, with a minimum rate of IDR 30.00 per kilogram of carbon dioxide equivalent (CO<sub>2</sub>e).
5. State revenue from the carbon tax is allocated through the State Budget (APBN) and may be used for various purposes, such as climate change mitigation, social assistance for affected low-income households, renewable energy subsidies, and others.
6. Taxpayers participating in carbon emission trading may be granted carbon tax reductions.
7. The carbon tax officially came into effect on 1 April 2022, initially focusing on entities operating coal-fired power plants through a cap-and-tax scheme, in line with the implementation of the carbon market in the coal power sector.

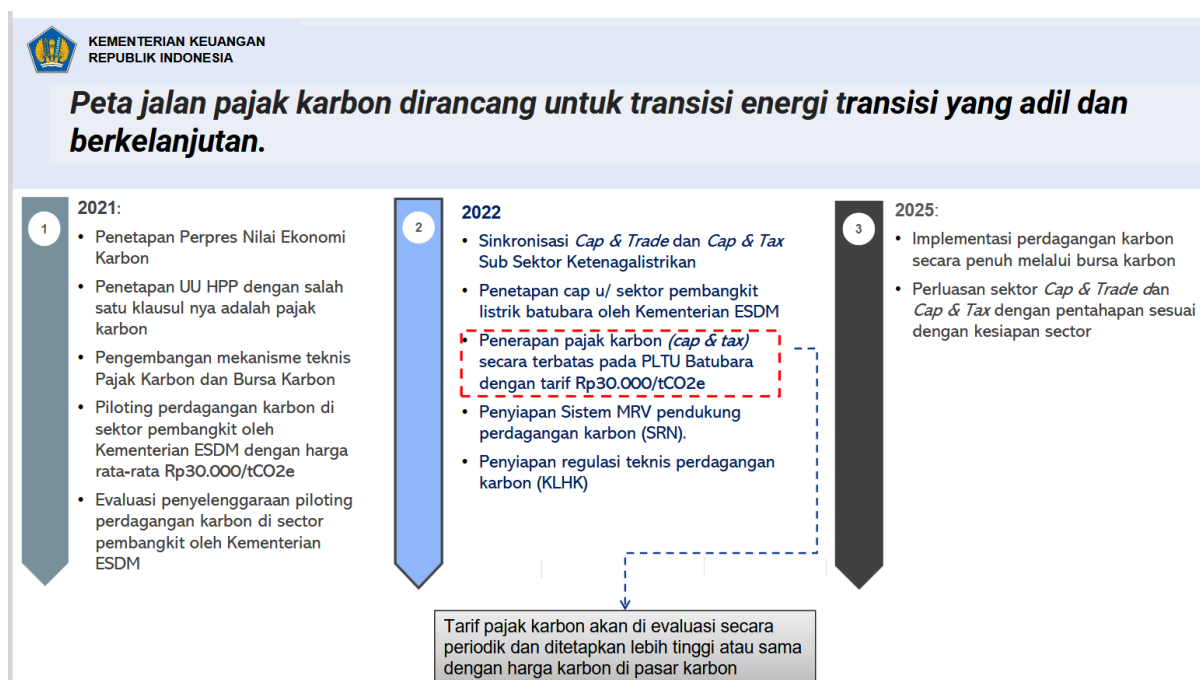
Various policy instruments, management approaches, and regulatory frameworks have been developed to address environmental degradation. However, these efforts have not been fully effective, as environmental damage continues to occur. So far, responsibility for environmental management has often been placed on organizations or business actors that attempt to mitigate its impacts (Yuniar Rahmatiar, 2018). The implementation of carbon taxation in Indonesia can serve as an effective step toward environmental conservation, as

this policy is designed to provide incentives for companies and individuals to reduce greenhouse gas emissions by imposing a tax on the amount of carbon emissions they produce. In addition to mitigating the impacts of climate change, carbon taxation also supports the transition toward a sustainable economy, in line with Indonesia's international commitments to reduce greenhouse gas emissions (Saidal Siburian, M. M., 2020).

One important aspect of carbon taxation is its potential as a new source of government revenue. According to research by Pratama et al. (Pratama, Bintang A, Muhammad A Ramadhani, Putri M Lubis, 2022), carbon tax is estimated to generate significant revenue, reaching approximately IDR 23.651 trillion in 2025 from the energy sector. This indicates that, in addition to reducing emissions, carbon taxation can also strengthen national fiscal independence, which is essential for supporting sustainable development programs. The implementation of carbon taxation can also encourage industries to shift toward more environmentally friendly practices.

With the enactment of Law Number 7 of 2021 concerning the Harmonization of Tax Regulations (HPP), the carbon tax roadmap is outlined into four main categories:

- a. Greenhouse gas emissions will continue to be reduced until 2030 as part of the pathway toward Net Zero Emissions (NZE) by 2060. The government targets a 29% emission reduction through its own efforts and up to 41% with international support by 2030.
- b. The three main sectors targeted for emission reductions are energy, transportation, and forestry, which together account for 97% of the total emission reduction target.
- c. The government will integrate carbon tax policies, carbon trading mechanisms, and other sectoral technical policies, including the phase-out of coal, the development of new and renewable energy, and the enhancement of biodiversity, in order to achieve NZE 2060.
- d. The carbon tax roadmap will take into account emission reduction strategies under the Nationally Determined Contribution (NDC), priority sector targets, and the development of new and renewable energy. These aspects will be further regulated through a Government Regulation.



**Tabel 1. carbon tax roadmap as published on the official Energy and Mineral Resources website (<https://gatrik.esdm.go.id>),**

Several concrete measures have been undertaken, including the implementation of a carbon tax starting on 1 April 2022 with a rate of IDR 30.00 per kilogram of CO<sub>2</sub>e, initially applied to coal-fired power plants. Preparations for this implementation began in 2021 through the development of a carbon trading mechanism. This policy forms part of Indonesia's commitment to achieving Net Zero Emissions (NZE) by 2060. This momentum needs to be continuously maintained and upheld as a shared responsibility.

By reducing dependence on fossil fuels and encouraging the use of renewable energy sources, carbon taxation can significantly reduce the carbon footprint. As explained by Harris and Ramadhan, carbon tax represents an initial step in the transition from fossil-based energy to new and renewable energy, supporting Indonesia's commitment to reducing carbon emissions by 29% to 41% in accordance with the Paris Agreement. In this context, collaboration between carbon taxation and carbon trading schemes, such as the REDD+ program, can enhance environmental sustainability in Indonesia. Research by Sunny Firdaus (Firdaus, Sunny U, 2024) shows that the synergy between these two instruments can strengthen environmental resilience to climate change while also supporting sustainable economic growth. By reducing dependence on fossil fuels and encouraging the use of renewable energy sources, carbon taxation can significantly reduce the carbon footprint. As explained by Harris and Ramadhan, carbon tax represents an initial step in the transition from fossil-based energy to new and renewable energy, supporting Indonesia's commitment to reducing carbon emissions by 29% to 41% in accordance with the Paris Agreement. In this context, collaboration between carbon taxation and carbon trading schemes, such as the REDD+ program, can enhance environmental sustainability in Indonesia. Research by Sunny Firdaus shows that the synergy between these two instruments can strengthen environmental resilience to climate change while also supporting sustainable economic growth.

The existence of carbon taxation is also expected to encourage green technological innovation. As stated by M.K. Anser (Anser, Muhammad K, Shujaat Abbas, Abdelmohsen A Nassani, Mohamed Haffar, Khalid Zaman, 2021), the implementation of carbon tax can stimulate the development of innovative carbon mitigation techniques to achieve environmental sustainability goals. Thus, carbon taxation functions not only as an economic instrument, but also as a driver of behavioral change and technological advancement in order to achieve broader sustainability objectives.

It is important to design and implement carbon taxation effectively in order to achieve the expected outcomes. This includes ensuring that tax rates do not place excessive burdens on industries and that the revenue generated is properly allocated to projects supporting renewable energy and emission reduction initiatives (Mehmet, 2020). Challenges in the implementation of carbon taxation must be carefully considered to ensure success in achieving emission reduction targets in Indonesia.

Overall, carbon taxation has significant potential to contribute to environmental conservation efforts in Indonesia. It not only helps reduce greenhouse gas emissions, but also fosters the development of a more sustainable economic system and supports broader environmental policy objectives.

### **Legal Certainty in the Implementation of Article 13 of Law Number 7 of 2021 concerning the Harmonization of Tax Regulations**

The implementation of Article 13 of Law Number 7 of 2021 concerning the Harmonization of Tax Regulations (HPP Law) regulates the imposition of a carbon tax as an instrument to reduce greenhouse gas emissions in Indonesia. This policy is expected to provide legal certainty in supporting the transition toward a sustainable economy. The carbon tax is primarily applied to high-emission sectors, such as coal-fired power plants, which are

major contributors to carbon dioxide (CO<sub>2</sub>) emissions in Indonesia (Wibisono, Adrian H, 2024).

Legal certainty regarding carbon taxation under Article 13 is crucial to encourage taxpayer compliance and reduce public resistance, which often arises from a lack of understanding of the benefits of this policy. Research indicates (Arifin, Amalia H, 2024) that carbon tax can serve as an effective tool for governments in environmental management and climate change mitigation, while also potentially increasing state revenue. Therefore, strengthening the legal framework and ensuring transparency in the use of carbon tax revenues are necessary to support programs focused on emission reduction.

Challenges in the implementation of this policy also arise from potential criticism regarding the use of carbon tax revenues. As stated by Tjoanto and Tambunan (Arifin, Amalia H, 2024), public trust in the government's management of carbon tax revenue significantly influences societal acceptance of this policy. Therefore, transparency in the management of carbon tax revenues must be a top priority for the government in order to strengthen the legitimacy of the policy.

The Government of Indonesia has postponed the implementation of the carbon tax twice since it was mandated under the HPP Law. The first postponement occurred on 1 April 2022, followed by a second postponement on 1 July 2022. To date, there is still no clear timeline regarding when this delay will be lifted. The Minister of Finance, Sri Mulyani, explained that the postponement was necessary to provide time for economic actors to prepare for and adapt to the new taxation system. She also emphasized that the implementation of the carbon tax will be carried out gradually, taking into account the development of the carbon market and the achievement of Nationally Determined Contributions (NDC) targets, as well as aligning with post-pandemic economic recovery efforts related to COVID-19.

Several reasons have been identified for the postponement, including the government's ongoing process of drafting and harmonizing the HPP Law with Presidential Regulation (Presidential Regulation No. 98 of 2021 on the Implementation of Carbon Economic Value) concerning the implementation of Carbon Economic Value (NEK). In addition, the government is currently focusing on maintaining price stability and public purchasing power, particularly during the Ramadan period, which has contributed to the decision not to prioritize the implementation of the carbon tax at this stage.

The Minister of Finance, Sri Mulyani Indrawati, stated that the postponement of the carbon tax was due to the fact that the implementation plan was not yet fully prepared. The carbon tax roadmap has not been 100% finalized; therefore, the government requires additional time to properly prepare its implementation in the middle of the year.

The postponement of the carbon tax in Indonesia has become an important issue affecting the country's efforts to reduce greenhouse gas emissions and fulfill its international commitments on climate change. Although carbon taxation has been regulated under Law Number 7 of 2021, its implementation faces various challenges and uncertainties, both in terms of regulation and execution (Barus, Eykel B, 2022). One of the main causes of the delay is the lack of detailed regulatory provisions governing carbon tax rates, as well as the mechanisms for determining tax rates and the tax base, which have not yet been clearly specified (Meila, Kaca D, Astari Dianty, 2024). Tjoanto and Tambunan (2022) emphasize that carbon tax policy must be integrated with other policy instruments and properly managed in order to effectively achieve emission reduction objectives. Without regulatory clarity, companies and industries find it difficult to adapt to a policy that has not been fully implemented.

Maghfirani (Maghfirani, Hilwa N, Namira Hanum, 2022) highlights that the implementation of the carbon tax, which was planned to begin in 2022 in the coal-fired

power plant sector, still faces numerous challenges, including sectoral readiness and its potential impact on the economy. For instance, industry actors express concern that high tax rates may reduce their competitiveness in the international market. In addition, Lolo (Lolo, Lawrence Daniel Ferwinz Andi, Achmad D Maulana, 2022) suggests that Indonesia should consider best practices from other countries, such as Sweden and Finland, which have successfully implemented carbon taxation without compromising economic growth. This indicates the need for a more integrated and strategic approach in formulating carbon tax policy in Indonesia.

The transformation of carbon tax implementation to support economic and environmental sustainability has become increasingly crucial. Revenue generated from carbon taxation can be used to finance sustainability projects; however, without legal certainty and transparency in policy execution, public trust in the use of these funds may decline. Research by Rahmasari (Rahmasari, Dina, Salma A Iskandar, 2024) emphasizes the importance of a normative legal approach and comparative analysis with policies in other countries to ensure that carbon taxation functions optimally without placing undue burdens on society, particularly low-income groups.

## CONCLUSION

### Conclusion of This Study:

Along with the development of industry and technology, the world is currently facing a serious environmental crisis, including climate change, pollution, biodiversity loss, and deforestation, all of which threaten the sustainability of the planet and life within it. Indonesia is also experiencing similar impacts, such as flooding, drought, air pollution, and increasingly extreme temperature rises. Various efforts have been developed to address environmental damage through policies, management systems, and regulatory instruments. One of the regulations enacted is Law Number 32 of 2009, which provides systematic and integrated efforts to preserve the environment as well as to prevent environmental pollution and/or environmental damage. However, environmental conditions continue to deteriorate. Subsequently, in 2021, Law Number 7 of 2021 concerning the Harmonization of Tax Regulations was enacted. Under Article 13 of this law, the government introduced a carbon tax, which is a tax imposed on products that generate carbon emissions and have negative environmental impacts. This policy is expected not only to serve as an environmental protection measure but also to improve the economy through tax revenues that can be allocated to environmental restoration.

Legal certainty in the implementation of Article 13 of Law Number 7 of 2021 on the Harmonization of Tax Regulations is essential to encourage taxpayer compliance and reduce public resistance, which often arises from a lack of understanding of the benefits of this policy. Therefore, strengthening the legal framework and ensuring transparency in the use of carbon tax revenues for emission reduction programs is necessary. This effort is reflected in the Carbon Tax Roadmap, which is designed to support a fair and sustainable energy transition from 2021 through its implementation phase. However, due to regulatory readiness, the development of carbon market mechanisms, unstable economic conditions, business readiness, and the preparedness of emission reporting, monitoring, and verification systems, the government has postponed the implementation of the carbon tax. Indonesia has delayed this policy twice since it was mandated under the HPP Law. The first postponement occurred on 1 April 2022, followed by a second postponement on 1 July 2022. The delay in implementing the carbon tax reflects the complex challenges in its execution. Strategic measures and multi-stakeholder involvement are required to ensure successful implementation while prioritizing environmental sustainability and social justice. Considering the absence of clear legal certainty, the government needs to promptly formulate

detailed regulations and clear mechanisms to avoid further uncertainty and to encourage the implementation of carbon taxation as part of global climate change commitments.

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