



## Penerapan Pajak Karbon di Indonesia: Peraturan, Tantangan, dan Dampaknya

### *THE IMPLEMENTATION OF CARBON TAX IN INDONESIA: REGULATIONS, CHALLENGES, AND ITS IMPACTS*

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#### ABSTRAK

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Pemerintah Indonesia menerapkan aturan pajak karbon melalui UU No. 7 Tahun 2021 sebagai langkah mengatasi perubahan iklim. Meskipun dianggap sebagai solusi lingkungan dan pendapatan negara, kebijakan ini menghadapi tantangan. Pajak karbon diharapkan mampu mengurangi emisi dan mendorong energi bersih. Namun, terdapat risiko gangguan ekonomi yang dapat mempengaruhi kelompok berpendapatan rendah. Meskipun dapat meningkatkan pendapatan negara, disisi lain pajak dapat menaikkan biaya produksi dan harga barang, merugikan daya saing produk domestik di pasar global. Penelitian ini menggunakan studi literatur untuk menganalisis tantangan, regulasi, dan dampak implementasi pajak karbon di Indonesia. Hasil penelitian diharapkan dalam penerapan pajak karbon di Indonesia untuk mempertimbangkan banyak faktor, termasuk penentuan momen yang tepat. Waktu pelaksanaan menjadi keputusan krusial karena berdampak pada ekonomi secara keseluruhan, termasuk struktur ekonomi dan pola konsumsi masyarakat. Penerapan pajak karbon dengan menggunakan pendekatan yang tepat dapat menjadi lebih efektif dalam mengurangi emisi dan mendorong transisi menuju ekonomi yang lebih berkelanjutan.

**Kata kunci:** Pajak Karbon, Pajak Lingkungan, Perubahan Iklim.

#### ABSTRACT

*Through Law No. 7 of 2021, the Indonesian government has enacted carbon tax regulations to address climate change. While seen as an environmental and revenue solution, the policy encounters challenges. The carbon tax aims to reduce emissions and promote clean energy but poses economic risks for low-income groups. Despite potential national revenue gains, it may escalate production costs and prices, impacting domestic product competitiveness globally. Utilizing literature studies, this research analyzes the challenges, regulations, and impact of the implementation of the carbon tax in Indonesia. The study underscores the importance of considering various factors, including timing, for effective implementation. Strategic timing affects the overall economy, economic structure, and societal consumption patterns. A well-thought-out approach can enhance the carbon tax's effectiveness in reducing emissions and fostering a sustainable economic transition.*

**Keywords:** Carbon Tax, Environmental Tax, Climate Change

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## INTRODUCTION

Greenhouse gases, also known as carbon emissions, encompass various types of gases that contribute to global warming. Global warming is primarily caused by carbon emissions and/or greenhouse gases, which are the main contributing factors. Carbon emission gases found in the atmosphere originate from various human activities. Naturally, the earth has contained greenhouse gases such as carbon dioxide (CO<sub>2</sub>) in the atmosphere (Barus & Wijaya, 2022). Examples of greenhouse gas compounds include methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), sulfur hexafluoride (SF<sub>6</sub>), nitrous oxide (N<sub>2</sub>O), and various other gas compounds (Barus & Wijaya, 2022).

The detrimental impacts of global warming are profound and can affect the survival of all life forms on this planet. These impacts include the melting of polar ice sheets, which has the potential to lead to rising sea levels (DJPP, 2017). This rise can result in coastal areas being inundated, forcing humans to seek new habitats to protect their survival (DJPP, 2017). Furthermore, global warming also has the potential to alter weather patterns in unpredictable ways, as described by the OECD (2020). These impacts will significantly affect farmers, as changing weather patterns can lead to widespread crop failures and food supply shortages. Therefore, minimizing greenhouse gas emissions has become a shared responsibility of all nations worldwide. This action is of paramount importance as it can protect the earth from the negative consequences of global warming on the lives of all creatures on this planet.

The Indonesian government has taken concrete steps towards achieving sustainable development by implementing the Pigouvian tax

principle in the form of a carbon tax. According to the Tax Foundation (2019), a Pigouvian tax refers to a type of tax imposed on output or production that has negative externalities on parties outside the market. The imposition of this tax is typically calculated based on the extent of the damage or harm suffered by entities outside the market due to these negative effects. Therefore, the carbon tax is a concrete example of a Pigouvian tax applied by the government with a specific purpose, which is to reduce carbon emissions. This measure is aimed at reducing the negative effects of carbon emissions production.

Carbon tax refers to a form of tax applied to each carbon emission that has harmful environmental impacts. This concept encompasses gases such as methane, carbon dioxide, greenhouse gases, and other gases (Tax Foundation, 2020). Generally, carbon taxes are applied to various economic activities that contribute to carbon emissions, both in the production and consumption phases. In production, companies that produce carbon gas emissions during the manufacturing process are subject to carbon taxes. On the other hand, from a consumer perspective, products and services that result in carbon gas emissions are subject to carbon taxes. According to the Tax Foundation (Tax Foundation, 2020), the primary goal of implementing carbon taxes is to minimize carbon gas emissions as a trigger for harmful global climate change. With this approach, it is expected that the impacts of climate change can be mitigated, thus creating a better environment.

If we look at it from a functional perspective, as outlined by Selvi et al. (2020), taxes, in this case, carbon taxes, can serve as a regulatory instrument. Taxes serve various

functions, and one of them is as a regulatory tool (Sidabutar et al., 2020). This regulatory function reflects the government's use of taxes to achieve specific objectives. The implementation of carbon taxes is considered to have a regulatory function because it is carried out with a clear intention, which is to reduce carbon emissions. Taxpayers' tax obligations and rights can be effectively fulfilled when they have an adequate understanding of tax regulations (Indrianto et al., 2022).

In regulating the implementation of a carbon tax, the government has enacted Law Number 7 of 2021 on Tax Regulation Harmonization. Through this law, the application of carbon tax is mandatory for activities that generate carbon emissions or for the purchase of goods with high carbon content (Undang-Undang Republik Indonesia Nomor 7 Tahun 2021 Tentang Harmonisasi Peraturan Perpajakan, 2021). The primary objective of implementing this carbon tax is to incentivize both the public and industries to engage in environmentally friendly economic activities with minimal carbon emissions. This step reflects the government's sincere commitment to achieving net-zero emissions by 2050.

Based on data obtained from the Directorate General of Climate Change Control, which is part of the Ministry of Environment and Forestry, in 2021, Indonesia recorded a total carbon emissions of 536,830,000 metric tons of carbon dioxide equivalent (Anugrah, 2022). The imposition of carbon taxes on transactions involving activities that produce carbon emissions or goods with carbon content has significant potential to increase state revenue. Not only does it bring economic benefits, but the implementation of carbon taxes also has a constructive impact on reducing carbon

emissions production. Its effects are evident, especially in mitigating the carbon footprint of the energy sector, which is the main contributor to carbon emissions in Indonesia.

There is some previous research that dealt with different aspects of carbon tax. Barus & Wijaya (2022) employed a qualitative descriptive approach, utilizing a combination of interviews and a literature review for data collection. The findings revealed that Sweden, boasting the world's highest carbon tax rate, effectively curbed carbon emissions without detriment to its economy. Strikingly similar results were observed in Finland, the pioneer in implementing a carbon tax globally, as it managed to reduce carbon emissions successfully while maintaining a positive economic outlook. Tjoanto & Tambunan (2022) focus on scrutinizing diverse factors that may present obstacles during the implementation of carbon tax policies in Indonesia, and propose effective strategies for the Indonesian government to surmount these challenges. Employing a qualitative approach, this research relied on an extensive literature review for data collection. The findings underscore that the hurdles encountered by the government in executing carbon tax policies in Indonesia stem from elements within the political system and governance, economic and business spheres, as well as public resistance.

Selvi et al., (2020) assess the imperative need for implementing a carbon tax in Indonesia. Conducted through a comprehensive literature review, the research relies on secondary data sourced from various online platforms and international journals. The study's outcomes strongly advocate for the implementation of carbon taxes in Indonesia, emphasizing the critical role they play in addressing the worsening

environmental conditions that impact public health, meeting international emission reduction targets, and serving as a compelling reason to reduce dependence on fossil fuels.

Indonesia's decisive steps in managing the implementation of carbon taxes as a response to carbon emissions issues are reflected in the Tax Regulation Harmonization Law (*UU HPP*). However, the text of this law leans more towards a general conceptual framework for the implementation of carbon taxes, while technical aspects, such as setting rates based on carbon market price fluctuations and detailed criteria for carbon tax implementation, still await further elaboration. As a result, the implementation of carbon taxes in Indonesia is currently facing challenges that need to be addressed (Pratama et al., 2022). As a step towards finding a clear solution, it is crucial to estimate the projected revenue that can be generated through carbon taxes and the concrete impact on carbon emissions reduction. This approach aligns with practices adopted by countries worldwide. Therefore, it is recommended to further investigate the aspects related to carbon taxes in Indonesia through more in-depth research.

This research aims to meticulously examine relevant regulations, identify potential challenges that may arise, and analyze the potential impacts of carbon emissions reduction through the implementation of carbon taxes in Indonesia. This analytical approach represents a novel contribution as it has been infrequently explored in previous research (Maghfirani et al., 2022). Therefore, the primary mission of this research is to provide an in-depth perspective on the tangible effects that may result from the implementation of carbon taxes on efforts to reduce carbon emissions in Indonesia.

The objective of this research is to enrich the literature related to carbon taxes in Indonesia while identifying the challenges and impacts of carbon emissions reduction. It is hoped that the results of this research will play a role in supporting the Ministry of Finance in formulating policies related to carbon tax revenue targets. Additionally, it is also expected to serve as a guideline for the relevant ministries responsible for monitoring carbon emissions levels post the implementation of carbon taxes in Indonesia.

The implementation of a carbon tax in Indonesia necessitates comprehensive analysis, considering its yet-to-be-applied status. In this context, various factors must be considered to ensure that this policy not only imposes an additional burden on the overall population but also does not disrupt their consumption patterns. Therefore, in-depth research is essential regarding the economic, social, and environmental implications of carbon tax implementation. A thoughtful strategy is needed to minimize negative impacts while promoting a shift toward more sustainable consumption patterns.

## **RESEARCH METHODS**

This research focuses on carbon tax implementation, highlighting how imbalances in its application can significantly impact the overall economy. The methodology employed is a Systematic Literature Review (SLR). The systematic literature review approach is a proven method that provides a transparent and reproducible process for the selection, analysis, and reporting of a specific topic (Cook et al., 1997). Consequently, this approach distinguishes itself from narrative literature reviews by

conducting a comprehensive and potentially more objective search (Massaro et al., 2016).

The scholarly literature indexed in Scopus, Sinta, and Google Scholar containing research on the implementation of the carbon tax was selected. The choice of Scopus, Sinta, and Google Scholar was based on their status as widely accessed repositories of citation/scholarly literature data, offering a broader and reputable range of journal publications. The data sources for this literature search were obtained from the Scopus website at <https://scopus.com/>. The search for articles utilized the keywords "carbon tax" on Scopus and "*pajak karbon*/carbon tax" on Sinta and Google Scholar, with a time frame limited to the years 2020–2023.

## RESULTS AND DISCUSSION

### Carbon Tax Regulation in Indonesia

The implementation of carbon taxation is carried out to minimize carbon emissions through the imposition of mandatory tariffs payable to the government. Economic actors, both producers and consumers in specific sectors, bear responsibility for activities that trigger carbon dioxide compounds. Furthermore, the implementation of carbon taxation can generate revenue for the government, which can be used to finance climate change mitigation programs. Similarly, environmental taxation can also stimulate economic growth when the per capita gross domestic product is high (Hassan et al., 2020). In the Indonesian Environmental Tax Law (*HPP*), the government of Indonesia has explicitly shown its commitment to implementing the concept of carbon taxation. The regulations concerning carbon taxation will focus on products with high carbon footprints or actions that emit carbon emissions, by the government's specified guidelines regarding

timing and amounts. Article 13, paragraph 1 of this law mandates that carbon taxation will apply to environmentally harmful carbon emissions. The law provides a detailed description of carbon emissions, including substances such as nitrous oxide (N<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), and methane (CH<sub>4</sub>). Furthermore, Article 13, paragraph 5, explains that individuals and entities involved in activities that produce carbon emissions will be responsible for paying carbon taxes. The scope of the carbon taxation object encompasses not only the purchase of goods with high carbon impacts but also activities that generate carbon emissions.

To determine the total carbon tax that must be paid, taxpayers need to establish the calculation basis based on the amount of carbon emissions arising from products with carbon content and/or activities that result in carbon emissions. The magnitude of these emissions will be regulated by the ministry authorized to measure the emissions produced by the product or activity. Once the tax calculation basis is identified, the next step is to calculate the amount of tax to be remitted. In this calculation process, the calculation basis will be multiplied by the carbon tax rate. Detailed information about the carbon tax rates is explained in Article 13, paragraph 8 of the Environmental Tax Law (*HPP*). This article asserts that the minimum carbon tax rate should be equal to or higher than the carbon price in the carbon market per kilogram of carbon dioxide equivalent (CO<sub>2</sub>e) or a comparable measure. Therefore, carbon tax rates may change in response to fluctuations in carbon prices in the market. However, the government has established a threshold for the carbon tax rate at Rp30 per kilogram of CO<sub>2</sub>e. This step is taken to ensure that the carbon tax rate will not fall below the Rp30 per kilogram of

CO<sub>2</sub>e threshold, even if carbon prices in the market fluctuate.

In Indonesia, the approach to implementing carbon taxation involves an innovative strategy known as "cap and tax." This approach combines two main concepts: the cap and trade system and carbon taxation. Under the cap and trade scheme, a maximum limit (cap) is set on the amount of emissions allowed to be produced by companies. This approach not only encourages emission reduction but also provides incentives for companies to adopt environmentally friendly sustainable technologies (Kristanti & Saptono, 2022). On the other hand, a different perspective emerges, where companies are granted permits to produce emissions with predetermined limits. If a company successfully reduces emissions below the established limit, the difference between the maximum emission limit and the actual emissions generated becomes an asset for the company. The Indonesian government plans to issue Emission Permit Certificates (*Sertifikat Izin Emisi* or *SIE*) as proof of this difference. However, if a company exceeds the set limit, it is required to pay taxes for the excess emissions. The calculation of carbon tax is done by multiplying the difference between emissions that exceed the limit by the applicable carbon tax rate. Nevertheless, the government also provides incentives in the form of carbon tax reductions to companies involved in carbon trading in the same market. Carbon trading involves transactions where emission permits or SIEs are purchased from other companies that have emissions below the maximum limit. The amount of carbon tax deduction granted is adjusted based on the number of SIEs successfully obtained by a company with emissions exceeding the established limit.

### **Challenges in Implementing Carbon Tax in Indonesia**

In the implementation of carbon taxation regulations, the Indonesian government needs to consider several crucial aspects. One of them is that the timing of carbon tax policy implementation should be chosen carefully, considering the appropriate timing (Maghfirani et al., 2022). The timing and momentum of policy implementation have a significant impact because the imposition of carbon taxes can influence the economic structure. The introduction of carbon taxation has the potential to trigger an increase in services and the prices of goods that have a carbon content in their production processes. Rising prices can affect consumer patterns in the consumption of these goods and services. This decrease in consumption could potentially slow down Indonesia's economic recovery process.

To mitigate the negative impact on the economy resulting from the implementation of carbon taxation, the government needs to adopt supportive complementary policies. These complementary policies aim to complement carbon tax policies and reduce potential economic distortions that may arise. One effective strategy for complementary policies is to provide incentives to promote the development of renewable energy sources (Tjoanto & Tambunan, 2022). By implementing such incentives, producers are allowed to manufacture goods using environmentally friendly energy sources, thereby reducing carbon emissions. This can prevent a significant increase in the prices of goods and services and help maintain stable levels of consumer consumption. Without government incentives to encourage the use of renewable energy sources, producers

may be more inclined to simply pay carbon taxes as a simpler and more certain option. This could hinder carbon emission mitigation efforts and reduce the motivation to transition to clean energy sources. In this context, special attention is needed to ensure that the incentives provided are appropriate and effective in encouraging the development of renewable energy sources. In this way, the implementation of carbon taxation can be more effective in reducing high-emission energy use and promoting a transition toward a more sustainable economy.

### **Impact of Implementation of Carbon Tax in Indonesia**

Carbon is generated through various human activities, including activities in the oil and gas industry, mineral mining, as well as livestock farming and agriculture. Carbon emissions come in various forms, including Methane Gas, Carbon Dioxide, and Carbon Monoxide, and are released into the atmosphere, where there are concerns that this can lead to harmful climate change (climate change). The negative impacts of climate change include a rise in global average temperatures by several degrees, which can result in the melting of polar ice caps (Salim & Sidiq, 2022). The melting polar ice caps lead to changes in coastlines and pose a real threat to many at-risk islands. The more carbon is released into the atmosphere, the higher the risk to Earth's ecosystems. Some countries have taken concrete steps to minimize carbon emissions by imposing taxes on companies that continue to emit carbon into the air. Each country applies varying tax rates in line with its policies. In Europe, carbon tax rates range from USD 1 to USD 100 per ton of CO<sub>2</sub> released into the air. The higher the amount

of carbon dioxide produced, the greater the production cost burden borne by companies.

However, the consequences of this tax will ultimately affect the prices of goods produced and also consumers who spend money to purchase them. In the mining sector, the amount of emitted carbon varies depending on the type of mineral commodity produced (Salim & Sidiq, 2022). Aluminum falls into the category of commodities with the highest carbon emissions, followed by nickel and steel. Aluminum production is closely related to carbon emissions because it relies on cheap electricity, primarily from coal-fired power plants, which are commonly used in China. However, for nickel and steel production, carbon emissions arise from the use of coal as a reducing agent in the processing of nickel and iron ore. If the electricity source used also comes from coal-fired power plants, carbon emissions will be even higher. Conversely, commodities like copper, zinc, and gold have lower carbon content, so the impact of carbon taxation on their selling prices is not as significant. However, the situation is very different for commodities like aluminum, steel, and nickel. The implementation of carbon taxes on these commodities has the potential to cause significant price increases.

### **Comparison with Carbon Tax Models in Other Countries**

Jonsson et al. (2020) stated that since 1991, the Swedish government has taken progressive steps by implementing carbon taxation policies as part of a significant change in the tax system. This move is aligned with tax reform known as the "green tax switch." The reform had its primary objective to respond to environmental issues that began receiving attention in 1988. From this reform emerged

carbon taxes, a form of tax regulation aimed at environmental protection, which was subsequently implemented in Sweden.

Since 1991, the Swedish government has implemented carbon taxes on the use of fossil fuels for heating and transportation purposes. This measure covers various types of fossil fuels, including coal, oil, and gasoline. However, over time, Sweden has granted exemptions to several sectors from the obligation to pay carbon taxes. These exemption measures were taken to maintain the country's economic stability. Some sectors that have been exempted from carbon taxes include industry, mining, agriculture, and forestry. Even though these sectors are not directly impacted by carbon taxes, the Swedish government still requires these industries to compensate for their emissions through a carbon trading system.

Sweden has identified three groups subject to carbon tax collection: distributors, importers, and large-scale consumers. This approach was adopted because Sweden does not have local fossil fuel producers, so the implementation of carbon taxation occurs at the distribution, importation, and large-scale consumer levels. For example, when a fuel importer imports gas from abroad to sell it to a Gas Station, the obligation to pay carbon tax will be applied to the importer. However, in some situations, the burden of carbon tax paid by importers or distributors is often passed on to the next party in the distribution chain. Distributors or importers tend to factor in the cost of carbon tax as one aspect of the total cost, which ultimately increases fuel prices (Jonsson et al., 2020).

The Swedish government has implemented various types of levies in response to carbon emissions, with carbon taxation being

one of them. In addition to the carbon tax system, Sweden also applies various other levies on fossil fuels. These levies include energy taxes, aviation taxes, carbon trading schemes, and vehicle taxes. Some of these levies existed before the introduction of carbon taxation. For example, the energy tax has been in place since 1924. Although carbon taxation was introduced later, the energy tax rates have been adjusted but continue to play a crucial role in supporting efforts to reduce carbon emissions. All of these levies reflect Sweden's commitment to addressing environmental challenges, particularly in addressing the impacts of global warming caused by carbon emissions.

Sweden has successfully reduced carbon emissions without harming its economy through the implementation of balanced policies to address the potential negative impacts of carbon taxation. According to Jonsson et al. (Jonsson et al., 2020), when implemented in 1991 as part of tax reforms, Sweden not only introduced carbon taxes but also made significant reductions in existing tax rates. These reduction efforts included lowering income tax rates for both individuals and business entities. In 1991, the Swedish government reduced individual income tax rates from 80% to 50%, while rates for business entities were reduced from 57% to 30%. Types of taxes that saw reductions included corporate tax, inheritance tax, and wealth tax, which were eliminated by the Swedish government starting in 2005. These steps reflect Sweden's efforts to make fundamental changes to its tax structure. The tax reform measures in 1991 helped balance the economic impacts of carbon taxes and contributed to Sweden's success in reducing carbon emissions without sacrificing economic growth.



Whether to reduce the tax burden on the public or to maintain economic stability, Sweden's decision to eliminate certain types of taxes and reduce income tax rates was a strategic move. The aim was to strike a balance between tax revenue and economic stability. Sweden chose not to earmark the revenue from carbon taxes for specific purposes but instead consolidated all carbon tax revenue as general government revenue. This was done to address the decline in revenue due to the elimination of certain types of taxes and reductions in tax rates. Consequently, revenue derived from carbon taxes was used to offset the decline in tax revenue, ensuring that the government had sufficient funding to support various government functions. Through this approach, Sweden has successfully demonstrated that carbon taxes can be an effective tool in reducing carbon emissions without harming the economy. This policy illustrates that wise actions in revenue management and tax adjustments can have a positive impact on achieving environmental goals while maintaining economic balance.

Bavbek (2016) explained that when carbon taxation was introduced in Finland in 1990, the carbon tax system approach was not solely focused on specific products that generated carbon emissions. Instead, the tax base consisted of two factors: the amount of energy produced and the amount of carbon emissions from the combustion used. The proportion of allocation between the two was 40:60. Finland's early initiative aimed to adopt a unified approach through carbon taxation that encompassed both elements, emissions, and energy.

Similar to Sweden, Finland has a similar approach when applying carbon taxes to carbon emissions generated by fossil fuels used for

heating and transportation (Barus & Wijaya, 2022). In this context, whenever fossil fuels are used for purposes such as heating or transportation, carbon taxes are applied based on the level of emissions produced by the type of fossil fuel used. The decision to implement carbon taxation covers various types of fossil fuels used in the transportation sector (natural gas and coal). The amount of tax imposed is calculated by multiplying the emissions generated from the use of fossil fuels by the applicable carbon tax rate at that time. In essence, Finland adopts an approach that aligns with the approach taken by Sweden in responding to the challenges of carbon emissions.

Finland has implemented exemption policies for sectors that are affected by carbon taxation, to maintain the country's economic stability, especially in sectors that play a strategic role in the economy. An interesting example is that the manufacturing industry sector in Finland is exempt from carbon taxation. This step was taken to ensure that the use of fossil fuels in the manufacturing process remains free from carbon taxes, with the rationale of protecting and preserving the competitiveness of Finland's core industries on the global stage (Bavbek, 2016). Furthermore, the wood industry sector also receives special treatment and is exempt from carbon taxation. This is due to the central role of the wood industry as a key advantage for Finland in the international market and as a major driver of the country's exports. The impact of these exemption policies is that carbon taxation coverage in Finland only includes approximately 36% of its total carbon emissions, creating a unique dynamic in the country's carbon tax regulations.

The results of carbon taxation implementation in Finland are indeed remarkable. The carbon tax implemented in the country has proven its success in reducing carbon emissions without causing negative impacts on the economy. This success is evident through the stable growth in Finland's Gross Domestic Product (GDP) from 1990 to 2020 following the implementation of carbon taxation. In the last two decades, from 2000 to 2020, Finland managed to grow its GDP by 114%, which is an outstanding achievement (Barus & Wijaya, 2022). The GDP growth figures indicate that the implementation of carbon taxation did not hurt Finland's economic performance. It illustrates that the measures taken by the Finnish government to reduce carbon emissions through carbon taxes have been accompanied by sustainable economic growth. Therefore, Finland has demonstrated that the wise and integrated implementation of carbon taxation along with appropriate economic policies can have a positive impact on both the environment and the economy simultaneously.

This success is not the result of a single effort but was achieved through a series of supporting policies designed collaboratively with the implementation of carbon taxation. Finland took steps to implement carbon taxation as a form of negative incentive. However, this approach is not the only strategy they implemented. Various incentive policies were applied by Finland to provide support to the population. The primary step taken to sustain economic growth was reducing income tax rates. That's why Finland decided not to earmark carbon tax revenue specifically for emissions reduction purposes. Instead, the revenue from carbon taxation was integrated into the central government's revenue. This step was taken

because Finland's tax revenue experienced a significant decrease due to the reduction in income tax rates. Therefore, the reduction in revenue needed to be balanced by revenue from carbon taxes.

### **Policy Implications**

With the enactment of Law Number 7 of 2021 on Tax Regulation Harmonization, the implementation of carbon taxation in Indonesia began in April 2022. In the initial stage of this implementation, the primary focus will be on power producers (Steam Power Plants) because the main source of energy used is coal. The selection of this sector was made as a first step to test the effects of imposing taxes on carbon emissions, as a preparatory step before the expansion of carbon taxation to other sectors in 2025. The plan to expand carbon taxation to various other sectors will be based on an evaluation of the readiness of those sectors and the economic conditions in Indonesia for the respective years.

Based on the Carbon Tax Law, as explained in Article 13, paragraph 1, it is stated that the implementation of carbon tax applies to carbon emissions that hurt the environment. Furthermore, the explanation of the Carbon Tax Law specifies that carbon emissions refer to gases such as nitrous oxide, methane, and carbon dioxide. These gases, which contribute to global climate change, will be measured in terms of carbon dioxide equivalents. Article 13 paragraph 5 of the Carbon Tax Law explained that individuals or entities engaging in activities that result in carbon emissions and purchasing goods containing carbon will be subject to carbon tax. Therefore, two main focus areas are subject to carbon tax: activities that generate carbon emissions and the purchase of goods containing

carbon. Details in the Carbon Tax Law further explain that goods containing carbon refer to other goods and fossil fuels that have the potential to produce carbon emissions. Additionally, the Carbon Tax Law also emphasizes that in this fifth paragraph, purchasing activities encompass both domestic purchases and imports. Furthermore, the Carbon Tax Law also states that activities generating carbon emissions include various actions that produce carbon emissions, such as in the agricultural, energy, forestry, industrial, land-use change, and waste management sectors.

The main basis for calculating Carbon Tax is the total volume of carbon emissions generated by goods containing carbon elements and specific activities contributing to those emissions. The estimation of emissions from these goods or activities will be measured and determined by the Ministry of Finance or an authority with expertise in assessing the emissions' impact caused by those goods and activities. The overall amount of carbon tax to be paid will be calculated by multiplying the Tax Base by the carbon tax rate. Article 13, paragraph 8 of the Carbon Tax Law states that the carbon tax rate in Indonesia will align with the prevailing carbon prices in the carbon market. This concept reflects that the implementation of the carbon tax in Indonesia will run in parallel with a carbon trading system, where the tax rate will be synchronized with the prevailing carbon prices in the market. As a result, the carbon tax rate will change to fluctuations in carbon prices in the carbon trading market. In regulating this aspect, Article 13, paragraph 10 of the Carbon Tax Law emphasizes that the provisions regarding the determination of the carbon tax rate will be stipulated by the Minister of Finance through

careful and thorough calculations by the Minister of Finance Regulations.

Article 13, paragraph 9 of the Carbon Tax Law regulates the determination of the minimum basis for the carbon tax rate. If the carbon price value in the trading market falls below the threshold of IDR30,000 per ton of carbon dioxide equivalent or IDR30 per kilogram of carbon dioxide equivalent, then the carbon tax rate will be maintained at the level of IDR30 per kilogram of carbon dioxide equivalent. The addition of this clause explicitly confirms that in Indonesia, the carbon tax rate will never fall below this point. Furthermore, Article 13, paragraph 10 of the Carbon Tax Law also mandates the Minister of Finance to have the authority to adjust this minimum basis as needed. This clause grants the Minister of Finance the freedom to adjust this minimum figure, either by increasing or decreasing it, through the issuance of Minister of Finance Regulations.

The fundamental function of a carbon tax is to serve as a regulatory and control tool. The implementation of a carbon tax acts as a controller, restricting, and altering the behavior of individuals and businesses to be more environmentally conscious, with the primary goal of minimizing carbon emissions. Indonesia's emission reduction targets have been established in its Nationally Determined Contribution (NDC), which was approved as part of the Paris Agreement in 2016. Indonesia has independently committed to reducing carbon emissions by 29%, and potentially up to 41% with support from other countries, by the year 2030, using 2010 emission levels as a reference. Strategic actions, such as the implementation of a carbon tax and the operation of a carbon trading system by the government, have been designed as key measures to help achieve the

targets set in this commitment. By incentivizing emission reduction through the imposition of taxes on carbon emissions and through carbon trading mechanisms that allow entities to buy and sell emission permits, Indonesia hopes to make a meaningful contribution to global efforts to address climate change and meet the established emission reduction goals.

## **CONCLUSION**

This research aims to analyze the challenges, regulations, and impacts of the implementation of the carbon tax in Indonesia. Implementing a carbon tax in Indonesia entails careful consideration of several key factors by the government. One critical factor is determining the optimal timing for such measures. Timing is crucial as it can impact the overall economy, influencing economic structures and consumption patterns. The imposition of a carbon tax may result in increased prices for goods and services with carbon emissions, potentially influencing consumer behavior and impeding economic recovery. Effectively implementing a carbon tax requires a thoughtful approach to reduce carbon emissions and facilitate a shift toward a more sustainable economy. Careful planning and phased implementation are essential to minimize adverse economic effects while achieving environmental goals, such as reducing carbon emissions and addressing climate change. This may involve gradually adjusting tax rates, providing incentives for emission reduction, and ensuring that vulnerable groups are not disproportionately affected. Proper timing and a well-designed carbon tax can play a significant role in fostering environmental sustainability and supporting long-term economic growth.

The government's steps in implementing carbon taxes primarily target carbon emissions reduction, aiming to stimulate innovation in the renewable energy sector. These measures also intend to raise production costs for energy from fossil sources like coal, currently the most economical for electricity generation. Beyond reducing greenhouse gas emissions, carbon tax implementation in Indonesia is expected to positively impact national economic growth and societal well-being. However, a careful approach is crucial to avoid negative effects on specific stakeholders. A key concern is the potential financial burden on industries or consumers purchasing carbon-intensive products. Therefore, considering economic and social implications, designing fair mechanisms, and implementing mitigation measures and compensation are essential to address impacts on industrial sectors and vulnerable community groups affected by carbon taxes.

This research faces limitations in conducting a deeper analysis of carbon tax implementation in Indonesia, given that the policy has not yet been enforced. Consequently, further research and monitoring will be necessary once implementation begins to compile a comprehensive analysis of potential economic, social, and environmental impacts. When carbon tax implementation commences, the authors hope to elaborate on key related aspects and provide a more in-depth perspective on how the policy will shape consumption patterns and economic activities in Indonesia.

This research is anticipated to serve as a valuable additional reference in the context of carbon tax implementation in Indonesia, encompassing in-depth analyses of potential challenges and their impacts. By expanding the reference base, it is hoped that readers will gain

a more comprehensive insight into the complexity of carbon tax implementation. This involves not only economic aspects but also social and environmental implications.

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