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IMPLEMENTATION OF CARBON TAX IN INDONESIA FROM A CARBON TAX DESIGN PERSPECTIVE

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ABSTRACT

Carbon emissions encompass all aspects of the economic and social fabric of society, thereby creating negative externalities for the public, necessitating government intervention. Various efforts have been made to curb carbon emissions, including the imposition of a carbon tax. The implementation of a carbon tax in Indonesia is inseparable from the regulations outlined in the Harmonization of Tax Regulation Law, which includes the roadmap for carbon taxation and carbon market development. Policies and plans for the implementation of a carbon tax require comprehensive planning from various determinants, namely factors in implementation, the object of the carbon tax, the sectors subject to it, subjects, rates, collection mechanisms, the timing of carbon tax imposition, reduced emission impacts, and revenue potential determination. The phased implementation strategy of carbon tax policies, building a coalition that supports such policies, precise management of carbon tax revenue, and combining carbon tax policies with other climate-related policies can be a solution for the government to address challenges in the carbon tax policy implementation process.

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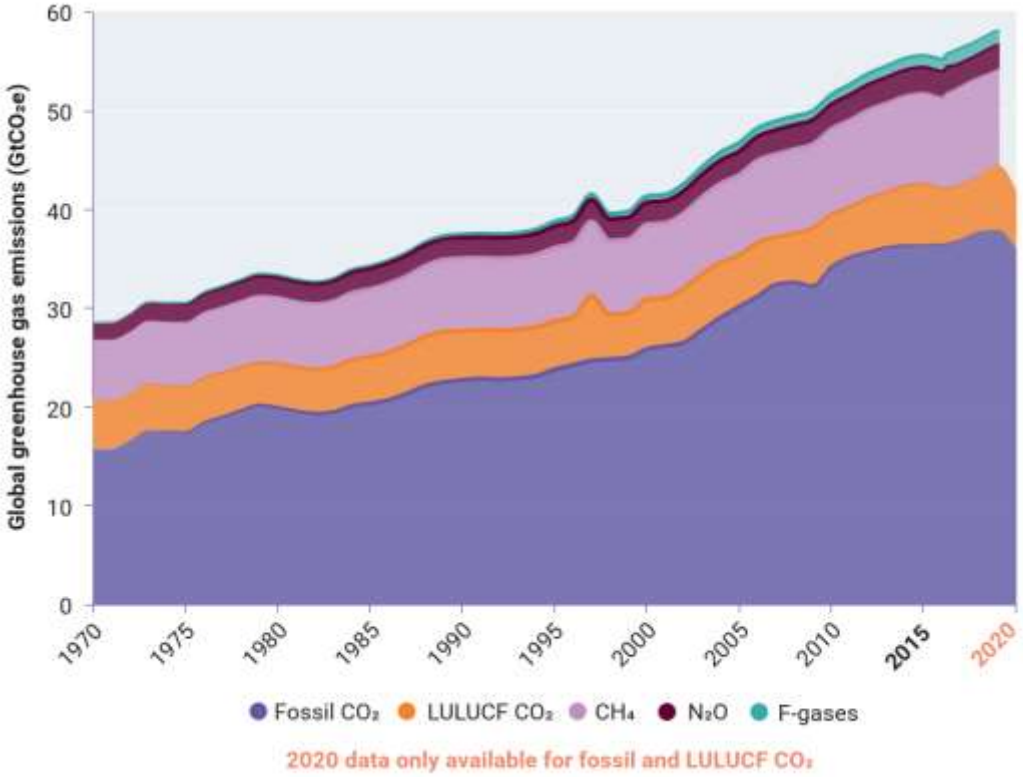
1. INTRODUCTION

Carbon emissions and carbon dioxide (CO2) emissions are not new issues globally. According to the United Nations Environment Programme (UNEP) 2017 report on emissions, global greenhouse gas emissions have been a particular concern since the 1970s and continue to be analyzed by the UNEP. Carbon emissions have doubled since 1970, and by 2020, the global community was found to produce 58 GtCO2e/year of greenhouse gases [1].

Carbon emissions have negative effects (externalities) on the environment and are one of the causes of global climate change. This process can impact the environment, human health, and create economic instability. According to the Cambridge Dictionary, carbon emissions are gases released from the combustion of carbon-containing compounds, such as CO2, methane, LPJ, and other fuels. In simple terms, carbon emissions refer to the release of carbon into the atmosphere. These emissions are caused by activities involving the combustion of carbon-containing compounds. To measure the extent of emissions, a carbon footprint assessment is conducted.

According to the Encyclopedia Britannica, a carbon footprint is the amount of carbon dioxide (CO2) emissions associated with an individual or entity's activities, such as buildings, companies, countries, etc. The concept of a carbon footprint often includes emissions of other greenhouse gases, such as methane, nitrous oxide, or chlorofluorocarbons (CFC). Carbon emissions also result from the burning of fossil fuels in manufacturing, heating, transportation, and the emissions required to generate electricity for the consumption of goods and services.

Based on UNEP 2021 data, there are no signs of a decreasing trend in carbon emissions, with CO2 emissions increasing each year. A strong rebound in emissions is expected in 2021, with early estimates indicating that fossil fuel CO2 emissions could grow by 4.8% in 2021 (excluding cement), and global emissions in 2021 are projected to be only slightly lower than the record levels in 2019, as shown in the figure below.



Source: UNEP Report (2021)

Generally, almost all countries contribute to carbon and greenhouse gas emissions. Indonesia was the fourth-largest emitter of greenhouse gases in the world in 2015. Indonesia's economy is the 16th largest globally and the largest in Southeast Asia. The highest emissions come from deforestation and peatland forest fires, followed by emissions from the burning of fossil fuels for energy [2].

Indonesia's annual greenhouse gas emissions were 2.4 billion tons of CO2 equivalent (GtCO2e) in 2015, according to data collected by the Potsdam Institute for Climate Impact Research (PIK). This figure includes emissions from land use, land-use change, and forestry. Indonesia's emissions represented 4.8% of the total global emissions in that year. Per capita emissions reached 9.2 tons of CO2e, higher than the global average (7.0 tons CO2e) and the averages in China (9.0 tons CO2e), the UK (7.7 tons CO2e), and the European Union (8.1 tons CO2e).

Carbon emissions encompass all aspects of the economic and social fabric of society, creating negative externalities for the public, requiring government intervention. The current Indonesian government has committed to reducing emissions by 29-41% by 2030, followed by achieving Net Zero Emission (NZE) by no later than 2060. This commitment positions Indonesia actively in the international arena. Indonesia is part of the G77 and China negotiation bloc on climate and a member of the Cartagena Dialogue. Indonesia is also a party to the Paris Agreement, where each country commits to a National Determined Contribution (NDC) regarding climate change. Indonesia signed the agreement on April 22, 2016, and ratified it through Law Number 16 of 2016 concerning the Ratification of the Paris Agreement, enacted on October 25, 2016.

After ratifying the Paris Agreement, the Indonesian government developed policies to implement it through Law Number 7 of 2021 concerning Tax Regulation Harmonization. This law includes provisions on carbon tax in Article 13, covering the regulation of carbon tax imposition; subjects, timing, rates, and utilization (earmarking). Essentially, the carbon tax is imposed on activities with negative impacts on the environment, such as damage, pollution, and environmental degradation. This aligns with Indonesia's commitment to the 6th Climate Change Summit to actively participate in climate crisis management. The key points include mobilizing climate financing and innovations, participating in market planning and carbon pricing, creating a transparent, inclusive, and fair carbon economic ecosystem [3].

Various efforts have been made to curb carbon emissions, including the implementation of a carbon tax. Currently, 27 countries apply carbon taxes, including Argentina, Canada, Chile, China, Colombia, Denmark, the European Union (27 countries), Japan, Kazakhstan, Korea, Mexico, New Zealand,

Norway, Singapore, South Africa, Sweden, the UK, Ukraine, and others. Countries considering joining include Brazil, Brunei, Indonesia, Pakistan, Russia, Serbia, Thailand, Turkey, and Vietnam. Carbon tax is considered a viable option to address climate issues both locally and internationally (Horowitz et al., 2017). A carbon tax is levied on the use of hydrocarbon-containing fuels, including oil, natural gas, and coal, which produce carbon dioxide (CO2) [4].

Certainly, in implementing carbon tax policies, there have been several regulations, namely: the UN Handbook and Law No. 7 of 2021. The United Nations issued a handbook titled "United Nations Handbook on Carbon Taxation for Developing Countries," specifically for developing nations as a practical and clear guidebook on policy and administration aspects in designing and implementing carbon taxes. The UN Handbook was published in 2021 by a committee addressing international issues and aspects of environmental taxation, particularly climate change and environmental degradation. Therefore, the UN Handbook serves as a guideline to ensure that carbon tax policies not only address emission reduction but also generate state revenue that can be reinvested in eco-friendly governance.

On the other hand, Law No. 7 of 2021 aims to implement a fiscal consolidation strategy focused on improving budget deficits and increasing tax ratios by regulating various tax governance, including carbon tax. The UN Handbook is intended for tax governance related to environmental issues and emission reduction for developing countries. Indonesia, as the first country to use the reference from the UN Handbook in implementing emission reduction through tax policies, including carbon tax.

The regulation of carbon tax policies in Law No. 7 of 2021 is stipulated in Chapter VI, Article 13, essentially regulating carbon tax policies and the roadmap for carbon tax or carbon market. Carbon tax policies include: 1) objectives of carbon tax imposition; 2) carbon tax subjects; 3) timing of carbon tax liability; 4) carbon tax rates; 5) addition of carbon tax objects; 6) revenue from carbon tax; 7) provisions related to General Tax Provisions. Meanwhile, regulations related to the roadmap for carbon tax or carbon market include: a) emission reduction strategy; b) priority sector targets; c) alignment with the development of new and renewable energy; and/or d) alignment with various other policies.

Indonesia has already imposed carbon tax starting in April 2022 for the coal-fired steam power generation sector due to the largest carbon emissions produced by coal compared to other fossil fuels. Starting from 2024, it will be extended to other sectors. The implementation of carbon tax is inseparable from the regulations in the Tax Harmonization Law, which includes the roadmap for carbon tax or carbon market.

The roadmap, as stipulated in the Tax Harmonization Law, requires a gradual commitment over several decades, posing many challenges in preparing policies and implementation plans. Moreover, the imposition of carbon tax has generated both pros and cons. Some opposing opinions argue that carbon tax can increase production costs, the issue of the burden will be applied to all industrial emissions, adding to the cost burden on industries and companies, which will then impact the purchasing power of the public and reduce Indonesia's competitiveness. Additionally, carbon tax can burden companies and affect the performance of emitters, influencing stock prices on the exchange.

These opposing opinions align with research conducted by Koh et al., analyzing the impact of carbon pricing on developing economies, specifically on companies and households, stating that companies with high competitiveness will not be affected by carbon tax. For households, carbon tax affects those with lower to middle incomes [5]. Furthermore, there are also positive opinions that see the benefits of implementing carbon tax, such as increasing state revenue, fostering creativity and innovation to find renewable energy, and addressing environmental pollution by reducing carbon dioxide production.

The existence of pros and cons poses a challenge in implementing carbon tax policies in Indonesia. The UN Handbook and Law No. 7 of 2021 serve as guidelines in implementing policies by considering the regulatory aspects in each provision, providing a basis for identifying factors in designing and subsequently implementing carbon tax in Indonesia. As demonstrated in Canada and Africa, which differ in designing carbon tax. Canada emphasizes the importance of simplicity, while South Africa adopts a more complex and nuanced approach. Optimal carbon tax design will achieve a balance between simplicity, complexity, and flexibility, considering national conditions, capacities, and requirements, while taking into account international developments [6].

Based on the pros and cons of carbon tax imposition, as explained earlier, it is important to examine the design of carbon tax policies that can be effectively and efficiently implemented based on three objectives: a) reduction of carbon emissions; b) tax revenue projections; and c) implementation efficiency. This paper will focus on a literature review of experiences from countries in designing and the

connection to the implementation of carbon tax policies. In Indonesia, these policies are based on the guidance from the UN Handbook and associated with the regulations in Law No. 7 of 2021. Considering the implementation of emission reduction policies, there are alternative methods, including not only carbon tax policies but also carbon trading policies.

The implementation of carbon tax, aligned with the goals in the roadmap in Law No. 7 of 2021, can reduce carbon emissions, but there are still challenges in its execution. Within the framework of understanding mentioned above, this research will be directed towards identifying the aspects that shape carbon tax policy design.

Literature Review

a. Implementation of Carbon Economic Value

The government has issued Presidential Regulation Number 98 of 2021 concerning the Implementation of Carbon Economic Value. The implementation of carbon economic value is carried out through carbon trading mechanisms, performance-based payments, carbon levies, or other mechanisms. The carbon levy is imposed in the form of taxation at both central and regional levels, customs and excise, as well as other state levies [7]. This research focuses on taxation in the field of taxation, known as carbon tax.

b. Pigouvian Tax and Externalities

According to the Presidential Regulation on Carbon Economic Value, carbon tax is imposed on carbon emissions that have negative impacts on the environment. Carbon tax, emerging to protect the environment, is an implementation of Pigouvian tax. In his book "The Economics of Welfare," Pigou developed the concept of externalities. Externalities are costs imposed or benefits provided to others that are not considered by the person taking the action. If someone creates negative externalities, such as pollution, they are too involved in activities causing those externalities. According to Pigou, when externalities occur in economic activities, the government will intervene in policy to address negative externalities, which may include imposing taxes [1]. State revenue is compensated for negative externalities produced by polluters [8].

c. Carbon Levies

Carbon levies are imposed based on carbon content, the potential for carbon emissions, the amount of carbon emissions, or the performance of climate change mitigation actions. In carbon tax, the government sets the tax rate and determines the sources subject to taxation. The reduction of emissions achieved depends on the response of the affected sources to tax imposition [9]. In calculating carbon levies, the government can use greenhouse gas emission reduction certificates [10].

d. Determination of Objects

In the implementation of carbon tax, the government must decide on which fuel or resource to tax and whether to place the tax upstream or downstream of emission sources [11]. Imposing tax upstream on emission sources with fewer taxpayers can provide an administratively efficient tax collection method. Meanwhile, imposing tax downstream, such as on electricity consumption, can provide more direct signals to consumers but may allow for greater administrative costs [12].

e. Determination of Taxed Sectors

In some countries that have implemented carbon tax, there is a selection of sectors subject to carbon tax. For example, in Finland, carbon tax is imposed on CO2 emissions caused by all fossil fuels, especially from the industrial, transportation, and building sectors. Fuels for electricity production, commercial flights, and commercial cruise ships are partially exempt from carbon tax. Carbon tax also does not apply to peat [13].

f. Determination of Subjects

Carbon tax is imposed on carbon emissions that have negative impacts on the environment. The subjects of carbon tax are individual taxpayers or corporate taxpayers who purchase goods containing carbon and/or engage in activities that produce carbon emissions. The objects of carbon tax are fossil fuels and emitted emissions [14].

g. Setting Tax Rates

Tax rates can be set in various ways [9]. One option is to set the tax rate equivalent to the estimated benefit of reducing greenhouse gas emissions by one ton equivalent to CO2, known as the social cost of carbon. Another option is to set the tax rate at a level that achieves emission reduction targets based on economic modeling. Tax rates can also be set at a level similar to other jurisdictions or at a level that generates the desired tax revenue. Regardless of the chosen rate, tax rates can be phased over time.

In practice, carbon tax rates vary between countries according to theoretical prescriptions, functions, and the tax imposition goals to be achieved [15].

To maintain its effectiveness or achieve further emission reduction, tax rates need to be adjusted periodically for inflation, increases in real income, technological changes, and other factors such as changes in fossil fuel prices. Most greenhouse gas emission reduction measures involve investments. Tax rates set several years in advance facilitate these investment decisions. Higher carbon tax rates can provide stronger signals to change public behavior, while lower tax rates may not change behavior significantly but can provide funds for carbon emission mitigation programs. The government aims to determine tax rates to maximize social welfare or minimize total pollution [16].

h. Impact on Consumers

Carbon tax can be more acceptable if the revenue is used to advance other social concerns. In this case, the impact on low-income households is considered due to concerns about the regressive nature of carbon tax, meaning disproportionate negative impacts on low-income households [17].

One of the main challenges in carbon tax is that the burden will fall more on the poor (low-income consumers). Low-income consumers tend to spend a larger portion of their income on meeting their basic needs (such as heating and electricity) and have fewer choices to replace those needs [18]. The management and distribution of funds from this levy are carried out by institutions managing environmental funds or other institutions appointed by the government. The use of this revenue can influence the support of households and companies [19].

i. The UN Handbook

On October 25, 2021, the United Nations issued a handbook titled "United Nations Handbook on Carbon Taxation for Developing Countries." This book was created by the UN specifically for developing countries as a practical and clear guide on policy and administration aspects in designing and implementing carbon taxes.

The UN Handbook on Carbon Taxation for Developing Countries is a very recent publication since it was issued in October 2021 by a UN committee overseeing international cooperation in tax matters, particularly environmental taxation. The UN Handbook also serves as guidance for developing countries on practical policies and administration in the implementation of carbon taxes.

Some guidelines contained in this book include:

1. Explanation of the initial introduction of carbon tax policy-makers,
2. Explanation of how to obtain public approval for the implementation of carbon tax,
3. Explanation of common issues in designing carbon tax,
4. Explanation of approaches to implementing carbon tax rates,
5. Explanation of the impact of carbon tax on households and firms,
6. Explanation of practical carbon tax imposition schemes,
7. Explanation of how to administer carbon tax,
8. Explanation of earmarking carbon tax revenue, and
9. Explanation of the relationship between carbon tax and other policy instruments.

2. METHOD

Research Methodology

This research employs a descriptive qualitative approach. Creswell states that qualitative research is a tool for exploring and understanding individual or group perspectives related to social or human issues (Cresswell & Creswell, 2009).

Types and Sources of Data

The data used in this research are secondary data. Data is obtained from books, journals, regulations, publications, and other literature.

Data Collection Techniques

The data collection technique used in this research involves gathering literature such as books, journals, regulations, publications, and other literature.

Data Analysis Method

The collected data is sorted, rearranged, presented in narrative form, and interpreted based on the information obtained. The data analysis method used in this research is a comparative descriptive analysis with a practical approach methodology, comparing carbon tax policies in several countries to serve as a reference in establishing the mechanism for implementing carbon tax in Indonesia.

3. RESULT AND DISCUSSION

Analysis of References

In this section, the first part explains the aspects that determine the implementation of carbon taxes based on practices referenced in several sources. The second part, based on these aspects, further explains the implementation of carbon taxes in Indonesia. The effectiveness of implementing carbon taxes as one effort to reduce carbon emissions is determined by the precision in designing carbon tax policies. The policy and implementation planning of carbon taxes require comprehensive planning based on studies of carbon tax implementation, considering several determining aspects: factors in implementation, carbon tax objects, applicable sectors, subjects, rates, collection mechanisms, timing of carbon tax imposition, reduced emission impacts, and determination of revenue potential.

a. Determination of Implementation Factors for Carbon Taxes

The implementation of carbon taxes faces several challenges, as indicated by Tjoanto et al.'s research on factors influencing carbon tax implementation, including political system and governance of government institutions, business and economic influences, and public resistance (Tjoanto & Tambunan, 2022). Political system and governance significantly affect decision-making regarding carbon tax imposition and the design of carbon tax collection systems. Additionally, it is essential to understand the strengths and weaknesses of carbon taxes and cap-and-trade schemes in carbon pricing, illustrated by their implementation in Canada, the United Kingdom, and Australia (Elsa & Utomo, 2022). Two influencing factors are identified: the presence of businesspersons in parliament, leading to conflicts of interest during discussions and decision-making, and government governance overlooking corruption, diminishing public trust in new policies like carbon taxes.

The business and economic impact suggests that carbon taxes may increase production costs, reducing the competitiveness of local production against imports. The general economic effect is predicted to lower consumption levels, particularly impacting the purchasing power of the population when production costs increase (Martini, 2022). These situations create pros and cons within society, where proponents see carbon taxes as beneficial for the environment, creating new job opportunities, while opponents argue that policies addressing emission issues and poverty cannot coexist. For example, an increase in electricity tariffs may burden low-income households. Public rejection of carbon tax policies is rooted in business sector opinions that carbon taxes disrupt the economy, mistrust in the government's management of carbon tax revenues, and skepticism about government programs' ability to reduce emissions, with allocated funds unrelated to environmental issues.

Furthermore, success in transitioning to a low-carbon economy depends on various factors related to economics, society, politics, law, and culture, requiring radical changes in technology, institutions, business strategies, and consumption practices, particularly strategic business factors. Human factors play a crucial role in changing business strategies, as human resources are vital for innovation and creativity to adapt to environmental demands. Human resources are a critical success factor in organizational strategies for a low-carbon economy. The success of environmental innovation in sustainable supply chains aiming for a low-carbon economy is related to various human success factors, exemplified by Brazilian companies incorporating Human Critical Success Factors (HCSF) for low-carbon eco-innovation (Jackson et al., 2011; in Jabbour et al., 2015).

b. Determination of Carbon Tax Objects (Upstream or Downstream) - See Journal References

In determining carbon tax objects, understanding the distinction between energy taxes and emission taxes is crucial. Carbon taxes are designed to reduce emissions, while energy taxes initially raise energy prices from the supply side to reduce emissions. Carbon taxes focus on taxing carbon dioxide emissions from energy users, aiming to protect the environment and reduce global warming by minimizing emissions. Energy resource taxes are levied on energy producers (energy production companies) to encourage rational energy resource use. Both approaches can positively impact CO2 emission mitigation. From the author's perspective, carbon taxes directly reduce energy user demand, while resource taxes directly reduce energy production. Therefore, a balance can be achieved between supply control and demand control (Lin & Jia, 2020).

As an illustration of energy taxes, they are imposed on producers using fuel that emits emissions in the production or industrial processes, such as power plants and vehicle users. Additionally, emission taxes are imposed on processes in both industry and transportation that generate emissions.

c. Determination of Affected Sectors

Sectors affected by carbon tax policies require sectoral policies not to disrupt business processes in those industries. Thus, the impact of carbon tax policies implemented in industrial sectors can stimulate

innovation to adapt to these policies. This aligns with Yang's (2010) research, suggesting that China should impose carbon taxes to control carbon emissions in the short term to promote technological innovation, transformation, and industrial improvement. Furthermore, the objectives of carbon taxes point to short-term goals, while carbon trading leans towards long-term goals, as Fang's (2012) study proposes a phased approach to emission reduction in China: short-term carbon tax collection to promote industrial structural adjustments and long-term programs where carbon emission trading mechanisms will eventually dominate regulations.

d. Determination of Subjects

The research results indicate that the implementation of CO2 taxes is generally suitable for Indonesia. The first reason refers to studies by the International Monetary Fund (IMF) and OECD, suggesting that carbon taxes could be one policy option available as a revenue stream due to pandemic pressures on tax revenue. Second, CO2 taxes are directed toward climate protection and serve as environmental protection tools. The method aims to reduce negative externalities in line with sustainable development principles. Third, many countries, including those in Europe, have introduced carbon taxes. However, the implementation of carbon taxes has not been applied in Indonesia, as evidenced by the negative impacts of carbon tax implementation [20].

e. Determination of Tariffs

A challenge in carbon tax implementation is tariff determination. The design of carbon taxes or emission trading systems (ETS) must consider effectiveness, efficiency, and feasibility, as carbon price stability can influence corporate investment decisions. If carbon prices fluctuate, investors may avoid investments to mitigate risks [19].

f. Determination of Collection Mechanisms

The design of carbon tax imposition can determine its effectiveness, especially in regions with different energy sources, populations, and households. Gilder's research, comparing the implementation design of carbon taxes in Canada, which prioritizes simplicity, with South Africa's more complex and nuanced approach, suggests that effective implementation can monitor tax obligations on taxpayers [6].

g. Determination of the Timing of Carbon Tax Imposition

Carbon taxes may be imposed, for example, when emissions from production occur, while energy taxes may be imposed when producing energy or using energy for production in various industries.

h. Determination of Reduced Emission Impacts

Research results show that a carbon tax can be applied in Indonesia. The ideal formulation of a carbon tax can be used as a reference in policymaking to address negative externalities of carbon emissions and global warming (Ratnawati, 2016).

i. Determination of Revenue Potential

The imposition of carbon taxes, aside from environmental purposes in addressing emissions, also generates revenue. Irama's study calculated the potential revenue of carbon taxes empirically, using the measured emission taxes approach with data from 14 industries on the Indonesia Stock Exchange for the period 2008 to 2018. The research found a minimum potential revenue of Rp 3.03 trillion per year from carbon emissions (Irama, 2019).

Discussion

In this discussion section, we will elaborate on how the analysis of references can serve as a reference in building policies and implementing carbon taxes. Given the numerous challenges in implementing carbon taxes, there is a need for efforts to design policy and implementation plans that consider determining factors, as outlined in the analysis subsection. The following are key points:

a. Implementation Factors of Carbon Taxes

Carbon taxes can be implemented in Indonesia, as indicated by Ratnawati's research. Carbon tax is considered simpler, more transparent, and accountable. The government intervenes to address negative externalities due to climate change and air pollution, imposing carbon taxes to encourage reduced fuel consumption by increasing its price. However, it is crucial to note that implementing carbon taxes can have various economic impacts, and the decision to implement them should consider both short-term and long-term effects.

b. Choosing Between Carbon Tax and Cap-and-Trade

The choice between carbon taxes and cap-and-trade schemes should be based on their advantages and disadvantages. Countries like Canada, the UK, and Australia have similar goals but different instruments, mechanisms, and tariff structures. The decision on which carbon pricing instrument to

implement should consider factors such as regulatory frameworks, optimal tariff determination, revenue redistribution, and alternative energy sources that align with public readiness.

c. Determining the Object of Carbon Tax (Upstream or Downstream)

Understanding the distinction between energy taxes and emission taxes is crucial in determining the object of carbon taxes. Carbon taxes are designed to reduce emissions, while energy taxes initially increase energy prices on the supply side to achieve emission reduction goals. The choice between taxing energy resources or emissions can positively impact CO2 mitigation.

d. Selecting the Taxed Sector

Selecting the sector for carbon tax implementation considers emission reduction goals, industry types, and their impacts. The experience of the United States suggests that choosing key sectors involves considering emission sector coverage, which gases to tax, and the total amount of greenhouse gas emissions to be covered. Broader coverage enhances the efficiency and effectiveness of the tax, providing more opportunities for emission reduction.

e. Determining the Tax Rate

Setting the carbon tax rate is a significant challenge. The design of carbon taxes or emission trading systems (ETS) must consider effectiveness, efficiency, and feasibility. The stability of carbon prices can influence companies' investment decisions. A fluctuating carbon price may discourage investments due to increased risks.

f. Mechanisms of Tax Collection

The design of carbon tax collection mechanisms influences its effectiveness. Regional differences, such as varying energy sources, population sizes, and households, should be considered. A simpler approach, emphasizing simplicity, may be more effective, as seen in Canada, while more complex approaches, like those in South Africa, may require effective implementation to monitor taxpayers' obligations.

g. Timing of Carbon Tax Imposition

Carbon taxes can be imposed at the time of emission from production or when using energy for production in various industries.

h. Determining Reduced Emission Impact

The research results suggest that a carbon tax can be applied in Indonesia, serving as an ideal reference for policy-making to address negative externalities of carbon emissions and global warming.

i. Estimating Revenue Potential

Carbon taxes not only contribute to environmental goals but also generate revenue. Empirical research estimates the minimum revenue potential from carbon taxes in Indonesia.

4. CONCLUSION

This article outlined aspects determining the implementation of carbon taxes, referencing practices from various sources. It further discussed the implementation of carbon taxes in Indonesia, emphasizing the need for comprehensive planning based on key determinants. These determinants include factors in implementation, the object of carbon taxes, the taxed sector, subjects, rates, collection mechanisms, timing of imposition, reduced emission impacts, and revenue potential. Research by Haites, Steenkamp, and Criqui, along with experiences from countries implementing carbon taxes, suggests a gradual implementation strategy, coalition-building, appropriate management of carbon tax revenue, and combining carbon tax policies with other climate solutions. Optimal carbon tax regimes balance simplicity, complexity, and flexibility, considering national conditions, capacities, and requirements, while staying informed about international developments.

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