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MAPPING THE IMPLEMENTATION OF CARBON TAX IN INDONESIA: LITERATURE REVIEW AND OPTIMISATION STRATEGIES

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Abstract
This research aims to map out how to achieve optimisation of carbon tax implementation in Indonesia based on the framework of carbon tax implementation in developing countries. The research is conducted through a literature study, by reviewing theories and findings from other researchers related to carbon tax implementation, application, positive impacts, and negative impacts. The study highlights the importance of establishing an effective carbon tax policy to reduce emissions and combat climate change, while also considering the challenges of limited data and capacity, social impacts, and coordination between ministries. This study also discusses the current condition of carbon tax implementation in Indonesia and discusses policy recommendations for optimal implementation. The results show that the current condition implementation carbon tax in Indonesia still has many things that need to be considered so that it can be optimised. This research is expected to contribute to the literature on carbon tax implementation in Indonesia and provide considerations for the Ministry of Finance in formulating carbon tax implementation policies.
Keywords: Carbon Tax, Implementation, Optimisation

INTRODUCTION

Climate change has become one of the most pressing global challenges of this century. According to the 2021 report of the Intergovernmental Panel on Climate Change (IPCC), human activities, primarily through greenhouse gas emissions, have clearly caused global warming, with global surface temperatures reaching 1.1°C above 1850-1900 temperatures in 2011-2020. This has resulted in widespread and rapid changes already occurring in the atmosphere, oceans, cryosphere, and biosphere. These changes affect many weather and climate extremes in every region of the world. This has led to widespread adverse impacts and loss and damage to nature and people. The latest report from the Global Carbon Project team of scientists shows that Indonesia is one of the top ten carbon-emitting countries worldwide. The amount of carbon Indonesia emits will increase by 18.3% by 2022, the most than any other country. The Indonesian government has shown its commitment to this issue.

Through the UNFCCC COP21 Paris in 2015, Indonesia announced its commitment to reduce greenhouse gas (GHG) emissions by 2030 by 29% with its own efforts and up to 41% with international assistance and cooperation. In addition, through the 2020-2024 Medium-Term Development Plan, the Government of Indonesia promotes low-carbon development, with one of the main focuses on reducing carbon emissions. This is supported by policies issued by the government to support this goal, one of which is through Law Number 7 of 2021 concerning Harmonisation of Tax Regulations (HPP Law), which regulates the imposition of carbon tax where the government regulates the carbon tax imposition scheme, which is planned to be implemented in 2022-2024 for the coal-fired power plant sector and 2025 onwards for full implementation of trade and expansion of the taxation sector according to the readiness of the relevant sectors.

However, the Ministry of Finance has postponed the implementation of the carbon tax, which was originally to be implemented from 1 April 2022. This postponement was made because the government was still preparing comprehensive implementation rules and was

planned to be implemented in July 2022. However, due to the global uncertainty factor and waiting for the readiness of industry players, the government again postponed the implementation of the carbon tax in July 2022. The government chose to find a more appropriate time, taking into account domestic and global conditions in implementing the carbon tax while still preparing the regulations. Currently, the government is targeting to start implementing carbon tax in 2025.

The government has taken concrete steps in realizing low-carbon development by implementing a pigouvian tax in the form of a carbon tax as an effort to reduce negative externalities in the form of carbon emission production. In regulating the imposition of carbon tax, the government has issued Law Number 7 of 2021 on Harmonization of Tax Regulations (HPP Law). The regulation states that a carbon tax is imposed on the purchase of goods containing carbon or activities that produce carbon emissions. The imposition of carbon tax aims to change the behavior of society and industry to switch to green economic activities that are low in carbon emissions. The regulation is a manifestation of the government's seriousness in achieving net zero emissions by 2050.

Given the global challenges related to greenhouse gas emission issues that are increasingly in the spotlight, carbon tax is one of the instruments used by the government in realising its commitment to reduce greenhouse gas emissions by 29% with its own capacity and 41% with international support by 2030 and towards Net Zero Emission (NZE) by 2060. With emission reduction targets in the energy and transport sector and the forestry sector already covering 97% of the total NDC emission reduction target, it is the top priority for greenhouse gas emission reduction. In addition to these two sectors, the national industrial transformation based on clean energy and carbon tax will follow towards Indonesia Emas in 2045 and NZE by 2060. Not only can a carbon tax help the government achieve greenhouse gas emission reductions, but it can also increase the potential for state revenue by increasing revenue in the taxation sector, although this is not the main purpose of imposing a carbon tax.
carbon tax.

This research aims to map out how to achieve optimisation of carbon tax implementation in Indonesia based on a framework for carbon tax implementation in developing countries (Muhammad, 2022). This research is conducted by conducting a literature study by looking for theories and by looking at the findings of other researchers related to the implementation, application, positive impact, and negative impact of carbon tax implementation to be used as a basis for building a framework in discussing the results of this research. In addition, this study also reviews policy recommendations related to the implementation of carbon tax implementation in order to optimise carbon tax implementation. This research is expected to complement the literature on carbon tax implementation in Indonesia. In addition, this research can be used by the Ministry of Finance to be considered in making policies regarding the rules for implementing carbon tax implementation, which until this paper was compiled had not yet been published.

LITERATURE REVIEW

Carbon Tax

A carbon tax is a type of Pigouvian tax that is aimed more at changing behaviour than at raising money. According to (Pigou, 1932), there should be a tax imposed that is equivalent to the marginal social loss generated to internalise the external costs of a producer's activity into its own costs. The aim is to manipulate the price of a commodity or service to collect all the unfavourable externalities it causes. The unavoidable consequences of an individual or organisation's behaviour are known as negative externalities. Carbon tax revenues can also be

earmarked to finance other sectors that affect people's lives and support the development of technologies related to energy renewal (Pamungkas & Haptari, 2022).

Sumner et al. (2011) define a carbon tax as an efficient but underutilised economic instrument to reduce greenhouse gas (GHG) emissions from transport and housing. The Carbon Tax Policy paper reveals that there are three basic options for imposing a carbon tax. Firstly, a tax levied on the carbon emissions emitted. Second, a tax levied depending on the amount of carbon content. Third, a tax levied on the energy produced.

The legal basis for the current carbon tax has been established, and rules have been drafted. The current regulation on carbon tax is Law No. 7 on Harmonisation of Tax Regulations. This year, the carbon tax is set to impose a tax on carbon emissions that adversely affect the environment. The carbon tax rate is set at a level equal to or exceeding the price of carbon in the carbon market, set at a minimum of IDR 30.00 per kilogramme of carbon dioxide. The allocation of government revenue derived from the carbon tax is implemented through the state budget framework. These funds can be used for various purposes, including climate change mitigation, provision of social assistance to poor households affected by the carbon tax, support for renewable energy subsidies, and other initiatives. The implementation of the carbon tax came into effect on 1 April 2022, primarily targeting entities involved in the operation of coal-fired steam power plants. The introduction of the cap and tax system is in line with the ongoing establishment of a carbon market in the coal-fired power generation industry.

Based on carbon content and/or carbon emission potential and/or carbon emission amount and/or mitigation action performance. Levy on carbon can be in the form of existing state levies (e.g., motor vehicle tax, fuel tax, STLG) or other levies to be implemented (e.g., imposition of carbon tax). Presidential Regulation No. 98 of 2021 on the implementation of Carbon Economic Value (NEK) states that carbon levies are defined as state levies both at the central and regional levels, based on carbon content and/or carbon emission potential and/or amount of carbon emission and/or performance of mitigation action. Levy on carbon can be in the form of existing state levies (e.g., motor vehicle tax, fuel tax, STLG) or other levies to be implemented (e.g., imposition of carbon tax).

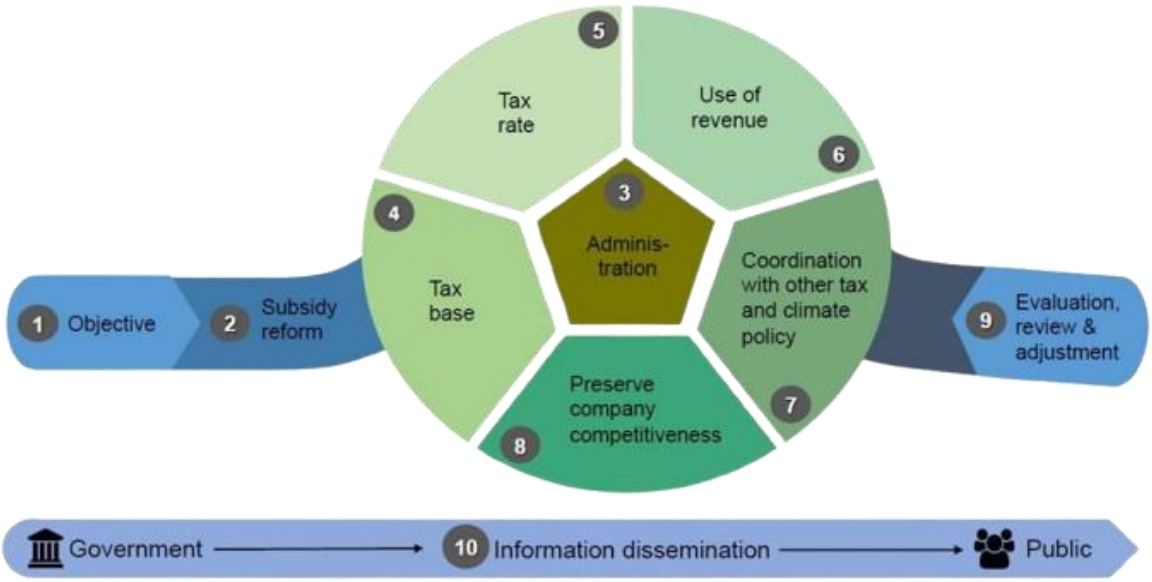
UN Handbook on Carbon Taxation for Developing Countries

The Handbook explains that environmental taxation instruments provide the benefits of raising revenues needed for public investment towards an eco-friendly transition and providing emissions and pollution reductions through signalling to carbon emitters. Carbon taxes also show potential to drive a range of macroeconomic benefits such as increased employment, economic diversification, and improved industrial competitiveness. Therefore, a carbon tax must be well-designed in order for a country to create a fiscal policy that aligns climate and environmental goals with its contribution to state revenue (Cottrell et al., 2017).

Policy Framework for Carbon Tax Implementation

Designing a carbon tax is a lengthy process and policy makers in developing countries must make decisions on ten key dimensions: objectives, subsidy reform, administration, tax base, tax rates, use of revenues, coordination with other tax and environmental policies, maintaining business competitiveness, evaluation, review & adjustment, and information dissemination (Muhammad, 2022).

Figure 1 Carbon tax implementation framework for developing countries



Source: (Muhammad, 2022)

METHODS

The research method in this article will use a literature review approach with a descriptive qualitative data analysis technique that aims to investigate and explore the understanding of the optimisation of carbon tax implementation in Indonesia through a discussion based on the carbon tax implementation framework for developing countries (Muhammad, 2022). This literature is relevant because Indonesia as a developing country, faces unique challenges in implementing carbon taxes that are different from developed countries, such as limited administrative capacity and the need to balance economic growth with environmental policies. The paper offers a framework that is specific to developing countries, so that it can be used to understand key factors in optimizing the implementation of carbon taxes in Indonesia. In addition, (Muhammad, 2022) also discusses technical mechanisms, economic incentives, and tax distribution that are relevant to the objectives of this study, namely to dig deeper into understanding the optimization of the policy. This literature not only provides a comprehensive theoretical framework but also provides empirical examples from other developing countries that can be used as lessons. Thus, the use of this literature supports a more in-depth analysis of the challenges and opportunities for implementing carbon taxes in Indonesia, as well as providing a basis for more appropriate policy recommendations to address the challenges of climate change.

The literature review approach will allow the author to identify, review, and analyse relevant literature that has been published previously on the topic. The data in this study will be in the form of scientific articles, research reports, books, official government documents, and other relevant publications related to the study of carbon tax implementation. These literature sources will be collected from various academic databases and trusted institutions, including scholarly journals, government websites, and leading financial institutions. Furthermore, the research results are not in numerical form but descriptive sentences arranged systematically for easy understanding, so the specification of this writing is called qualitative descriptive.

The analysis in the literature review will be conducted through an in-depth discussion according to the carbon tax implementation framework for developing countries, containing ten main dimensions including objectives, subsidy reform, administration, tax base, tax rates, use

of revenue, coordination with other tax and environmental policies, maintaining business competitiveness, evaluation, review & adjustment, and information dissemination. Relevant and high-quality literature will be selected for inclusion in the review. The data synthesis process will involve in-depth analysis of the selected literature. Findings from different literatures will be collated and analysed descriptively to look for patterns, trends, and comparisons related to optimising carbon tax implementation in Indonesia. The study will highlight what steps should be taken to optimise the implementation of carbon tax in Indonesia.

Through the literature review method, this research is expected to present a comprehensive picture of the optimisation of carbon tax implementation in Indonesia and the steps that policymakers should take. Analysis of the collected literature will provide a strong theoretical foundation to understand the Indonesian government's efforts, challenges, and opportunities in optimising carbon tax implementation in Indonesia. As such, this research will make an important contribution to strengthening knowledge on carbon tax implementation and provide valuable insights for readers and relevant stakeholders.

RESULTS AND DISCUSSION

Objective

Designing effective policies starts with setting clear goals (Cottrell et al., 2017). In the context of a carbon tax, policymakers need to define the medium- and long-term targets to be achieved. Some of these include CO2 emission reductions with the primary goal of reducing greenhouse gas emissions to combat climate change. Measurable and ambitious emission targets should be set. Then, revenue mobilisation, where in developing countries carbon taxes can be a significant source of state revenue. These funds can be used for various purposes, such as debt reduction, investment in critical infrastructure, or social and environmental programs (Cottrell et al., 2017). In addition, other social and economic objectives need to be determined, where a carbon tax can also be designed to promote objectives such as job creation, poverty alleviation, and improved energy security.

In the webinar on the Implementation of Carbon Economic Value in the Electricity Subsector with the theme Carbon Tax in Indonesia: Efforts to Mitigate Climate Change and Sustainable Economic Growth carried out by the Ministry of Finance on 2 December 2021, it was stated that carbon tax is one of the instruments of the Value of Carbon Economy (NEK), where the implementation of carbon tax will be aligned with the carbon trading mechanism. Then, it was also stated that the purpose of imposing a carbon tax is to change the behaviour of economic actors to shift to low-carbon green economic activities. The goal is to support GHG emission reduction targets in the medium and long term and encourage the development of carbon markets, technological innovation, and investments that are more efficient, low-carbon, and environmentally friendly. The principles applied are: (1) fair, based on the 'polluters-pay principle'; (2) affordable, taking into account affordability aspects for the benefit of the wider community; and (3) gradual, taking into account sector readiness so as not to burden the community.

Supported by several empirical studies on the positive impacts that can be the goal of implementing a carbon tax, among others: GDP increases with carbon tax, emissions, research and development, and population (Gurtu et al., 2022). Then carbon taxes can cause significant reductions in carbon emissions (Gugler et al., 2022). In addition, carbon taxes also increase government revenue, savings, and domestic selling prices (Shen & Zhao, 2022).

On the other hand, achieving the optimal goal in implementing a carbon tax may face several challenges, such as data and capacity limitations, as it may be difficult to monitor emissions and implement the carbon tax effectively in the beginning. Another concern is the social impact, where a carbon tax may negatively affect the poor if not carefully designed. In

addition, there is a lack of political support for a carbon tax given Indonesia's substantial energy subsidies.

However, the challenges of implementing a carbon tax in Indonesia can be resolved in several ways, such as building systems and technical and financial support, including administration and resources to monitor emissions and implement a carbon tax. Then, designing a fair carbon tax policy to protect the poor and vulnerable and raising public awareness about the benefits of carbon tax and the importance of combating climate change. These things, if implemented, will be able to overcome the challenges that may arise along the way of implementing a carbon tax in Indonesia.

Subsidy Reform

Removing environmentally harmful subsidies is an important first step towards implementing an effective carbon tax. Fossil fuel and energy subsidies, and energy mispricing in general, are damaging and counterproductive policies that undermine the environmental benefits of carbon pricing and should be reduced (OECD & WBG, 2015). Supported by research conducted Coady et al. (2015) on 32 developing countries, including Bangladesh, Sri Lanka, Cambodia, India, Malaysia, Pakistan, the Philippines, Thailand, and Vietnam, it shows that energy price subsidies, particularly for petrol and liquefied petroleum gas (LPG), are disproportionately channelled to high-income households, exacerbating existing wealth disparities. Furthermore, these subsidies also encourage excessive energy use and limit incentives to improve energy efficiency or reduce household pollution and GHG emissions. In addition, fossil fuel subsidies often worsen a country's trade balance and put enormous pressure on government finances (Heine & Black, 2018).

Subsidy reform pushes government spending towards less environmentally harmful behaviour and also internalises external costs, which can save a lot of money (Cottrell et al., 2017). Carbon pricing and energy price changes mutually reinforce policy strategies that improve energy access and higher-quality energy services (OECD & WBG, 2015). Any proposed subsidy reform should thoroughly assess the likely impact of the reform on sensitive sectors, such as energy-intensive businesses and low-income groups, and quantify the direct and indirect impacts of the reform (Cottrell et al., 2017).

Indonesia has demonstrated three fundamental aspects of successfully implementing subsidy reform. Firstly, setting the right energy price, which means phasing out subsidies gradually, consistently, and systematically. Second, limiting the consequences of change by thoroughly analysing and implementing its impacts, particularly on vulnerable populations and international competitiveness. Third, increase support for reform by implementing a long-term and comprehensive reform program (Beaton et al., 2013).

Administration

In the implementation of carbon tax, the formation of policies such as laws and the appointment of institutions that carry out administration are important. According to United Nations (2021), there are at least nine basic things that must be observed in the formulation of this carbon tax policy. These include: taxpayer registration criteria and registration period; reporting and bookkeeping; information that needs to be included by taxpayers in each declaration; criteria and requirements for tax exemptions and reimbursements; tax return submission period; administration and control to secure tax payments; responsibility thresholds; control mechanisms and emission reporting guidelines; and compliance and enforcement mechanisms.

Policy formulation requires inter-ministerial coordination. This is particularly important in looking at and mapping climate policy instruments and the underlying policy framework (Muhammad, 2022). Legislative coordination between jurisdictions is necessary to enact a coherent carbon tax and avoid the risk of double taxation. In addition, public discussions should

involve a broad group of stakeholders, including potential agencies tasked with administering the tax, tax authorities, other relevant agencies, as well as business, trade, and consumer organisations representing members likely to face tax burdens and tax advisors or accountants. This can support public acceptance and avoid criticism of the objectives as well as the risk of civil society distrusting the institution.

Based on the above, the Government of Indonesia has established a carbon tax policy through Law Number 7 of 2021 on Harmonisation of Tax Regulations by appointing the Ministry of Finance as the institution that will carry out the administration related to the implementation of carbon tax. The appointment of the Ministry of Finance as the institution that will carry out the administration related to the implementation of carbon tax is the right choice, considering the relatively lower administrative costs as the entire state revenue process in Indonesia is managed by the Ministry of Finance. Nonetheless, the Ministry of Finance must maintain cooperation with other agencies and ministries to ensure that the imposition of carbon tax is in line with the objectives to be achieved.

Despite being enacted into law, the Government of Indonesia has yet to enact implementing regulations related to carbon tax implementation. In draughting these implementing regulations, there are many things that need to be considered by the government in order to achieve the objectives of carbon tax imposition. Good carbon tax administration will increase tax revenue by taxpayers and will also help the tax administration provide better services. It is important to avoid unnecessary workload for taxpayers and tax officials. It is important to ensure that the introduction of a carbon tax does not result in a significant increase in administrative burden for both businesses and the Ministry of Finance.

The Indonesian government must pay attention to the nine basic things mandated by United Nations in formulating this policy. The Ministry of Finance should conduct a comprehensive public discussion with all parties to formulate this policy. The presence of business organisations and other ministries will provide more comprehensive considerations and can reduce costs that may arise when this policy is implemented. In addition, the issue of corruption in state revenues is still a concern in Indonesia. Therefore, the government must increase revenue to support better law enforcement, increase tax collection capacity, and improve financial governance standards. This effort can also reduce the level of corruption by ensuring that officials are able to refuse bribes.

Tax Base

Many international organisations and experts agree that the carbon tax base should be as broad as possible with few or no exemptions. However, due to resource constraints, developing countries may struggle to reach a wide range of sectors. The OECD and the World Bank suggest taxing the largest sources of emissions first, then gradually expanding the tax to other sources. For example, Chile only taxes the electricity sector, while Mexico taxes all sectors except natural gas, the country's main fossil fuel. In Colombia, the carbon tax on natural gas only applies to the petrochemical and refining sectors.

It is recommended to implement carbon taxes upstream in the fuel supply chain to limit accumulation points and cover as much as possible (Cottrell et al., 2016). Upstream carbon taxes can be an effective tool for developing countries to shift the tax burden from the formal to the informal sector. In contrast, midstream or downstream approaches are more appropriate for sectors with lower carbon emissions, such as industrial processes, agriculture, and forestry (Conway et al., 2017). This approach covers most of the energy-related CO2 emissions in the system, involving only a few directly responsible parties.

While it may seem ideal in theory to implement a carbon tax upstream for maximum coverage, economic, political, and regulatory constraints in some developing countries may make carbon taxes more effective if implemented downstream. For example, in developing

countries with tightly controlled energy markets and fixed prices, an upstream tax on electricity use may be less effective in changing behaviour and increasing energy efficiency. In contrast, implementing a carbon tax downstream of electricity use may be more effective in encouraging behavioural change and energy efficiency (Cottrell et al., 2016). In a downstream approach, policymakers should set a threshold or minimum level of activity that triggers a carbon tax liability in order to reduce reporting and administrative costs (Conway et al., 2017).

Exceptions may be possible in exceptional economic circumstances but should be carefully considered (Parry et al., 2012). Activities that generate GHG emissions may be so small or technically difficult to tax that they are not administratively feasible. This issue becomes even more pressing when considering taxation of non-fossil fuel GHG emissions, as their sources are diverse and decentralised, making it difficult to tax specific points in the supply chain (Bordoff & Larsen, 2018). Policymakers in both developed and developing countries often face significant obstacles in enacting energy taxes without exemptions or lower tax rates for energy-intensive industries (Cottrell et al., 2016). However, according to the UN, exemptions lead to inefficiencies in pollution reduction and undermine the "polluter pays" principle, resulting in a detrimental trade-off between environmental effectiveness and political feasibility (Cottrell et al., 2017).

Tax Rate

Important factors affecting the efficiency of a carbon tax are the initial tax rate and its escalation. (Conway et al., 2017) suggest several methods for determining tax rates, including the social cost of carbon (SCC), reduction targets, revenue targets, and benchmarking targets. Each approach requires estimating relationships, such as estimates of GHG emissions, climate change damages, and revenue targets. The calculations can be complex because they involve combining uncertain science, including predictions for the distant future (Cottrell et al., 2016). (Metcalf & Weisbach, 2009) suggest delegating some of the authority to set rates to expert bodies, which will ensure that tax rates are periodically re-evaluated and provide expertise in setting relevant parameters. Once tax rates are determined, they should be applied uniformly across taxpayers or sectors to achieve cost efficiency and reduce competitive distortions (Parry et al., 2012). Different tax rates will distort competitiveness and reduce incentives to reduce environmental damage in some sectors (Cottrell et al., 2016).

Tax rate increases can be determined using various approaches, such as trajectory, adjustment, periodic review, or political approaches depending on the social, economic, and political context of the country. When the primary objective of a jurisdiction is to raise revenue through a carbon tax, tax rate increases can be adjusted to generate a certain amount of revenue while remaining within the constraints of supply and demand (Conway et al., 2017). Haites (2018) state that the carbon price must be higher than the SCC and relative to the price of the taxed fuel to be effective. A higher carbon price means a stronger incentive to reduce emissions (Flues & Dender, 2020). Governments must ensure that the pricing system is adaptable to unexpected events and remains predictable to maintain incentives for innovation and long-term investment in low-carbon technologies (OECD & WBG, 2015).

However, in practice, the development and implementation of carbon tax policies, including the setting of tax rates, is a political process (Cottrell et al., 2016). For example, Chile plans to use the Social Cost of Carbon (SCC) as its national benchmark. However, due to disagreements over the SCC value, governments have decided that this strategy is impractical in the medium term and have opted to use global carbon pricing instead (Conway et al., 2017). This often results in tax rates that are too low to meet OECD best practice recommendations for achieving significant environmental impact (Cottrell et al., 2016). Therefore, it is highly recommended that politicians in developing countries implement carbon taxes at low rates by

including a range of tax rates in legislation so that rate increases can be implemented without significant political resistance in the future (Cottrell et al., 2017).

Use of Revenue

Carbon tax revenues must be used productively to keep the cost of carbon tax low. If revenues are not used productively, the overall cost of the policy to the economy will increase significantly (Muhammad, 2022). Wise use of carbon tax revenues can increase economic efficiency and overall economic benefits by reducing market failures. There are several methods for the government to allocate revenues from this carbon tax, namely revenue distribution, increased government spending, and a combination of both. The most recommended method is to add this revenue to the state general budget so that the government can use this revenue for various sectors, including during a crisis or changes in spending policy.

The government can distribute revenues from carbon taxes in various ways, such as direct cash assistance, health subsidies, free education, or the provision of alternatives to high-emission resources. This type of assistance is expected to provide incentives for low-income people to improve energy efficiency and reduce emissions. This approach can encourage the creation of social justice, protection of vulnerable groups, and prevention of poverty increases. To ensure the effectiveness of assistance, the role of institutions is very important in determining the right way to target poor households and distribute funds efficiently. In this way, the government can ensure that the assistance actually has a positive impact on low-income communities and promotes broader environmental policy goals.

In addition, with the addition of state revenue from the carbon tax, the government can use this revenue to provide other tax incentives, such as income tax. This can increase economic growth and productivity without reducing government revenues before and after the carbon tax is implemented. The government should also specifically allocate carbon tax revenues for environmental programs such as environmentally friendly technology subsidies, climate finance, public transportation, and research and development. These programs can improve the welfare of low-income communities by increasing energy efficiency and public transportation.

Article 13 paragraph 12 of the HPP Law states that revenue from the carbon tax can be allocated to control climate change. This is in accordance with the description above. However, it is important to note that all carbon tax revenues do not have to be fully allocated to climate change control programs in order for the economy to remain stable. This spending policy should still go through a political process to ensure transparency and increase public trust in the management of the taxes they pay, while increasing public support for the carbon tax policy.

Coordination with Other Tax and Climate Policy

The Paris Agreement and Law Number 16 of 2016 demonstrate the Indonesian government's commitment to reducing greenhouse gas emissions. In the explanation of the HPP Law, it is stated that in order to fulfil Indonesia's commitment made through the 2016 Nationally Determined Contribution (NDC), the Indonesian government will start imposing a carbon tax starting in 2022. The carbon tax is supported by a strong basis, namely reducing carbon emissions, maintaining the sustainability of living things, and fulfilling the Indonesian government's promise to address environmental issues (Barus & Wijaya, 2022).

To raise awareness of corporate social and environmental responsibility, the Financial Services Authority (OJK) has stipulated OJK Regulation Number 51/POJK.03/2017 (POJK No. 51), which requires every public company or issuer to prepare a sustainability report, which is published and accessible to the public. OJK Circular Letter (SEOJK) Number 16/SEOJK.04/2021 further explains the disclosure of carbon emission levels. Most greenhouse gas emissions come from fuel consumption, electricity, and business travel by plane. In addition, SEOJK Number 16 provides guidelines for calculation methods that follow applicable provisions.

According to research (Sudjono & Setiawan, 2022), most coal sector companies in Indonesia have followed the provisions of POJK 51 concerning Sustainable Finance, including disclosure of carbon emissions. However, this disclosure does not cover all emissions, whether from parent companies, subsidiaries, or business lines. This will be a problem if carbon taxes are imposed at different rates in various business lines.

To support better carbon emission reporting and efficient carbon tax implementation in Indonesia, collaboration is needed between OJK as the capital market regulator and the Directorate General of Taxes as the tax regulator. This regulatory integration helps clarify the basis for imposing carbon taxes and increases taxpayer compliance, especially in the coal sector, in disclosing carbon emissions according to the rules. If a carbon tax is implemented, the revenue must be used for activities related to reducing carbon emissions (earmarked) (Irama, 2019).

A clear legal structure is needed to support carbon tax policies. A special audit body established by the Ministry of Energy and Mineral Resources, the Ministry of Environment, and the Ministry of Finance should oversee the implementation of the carbon tax to ensure that it is implemented effectively. Since the carbon tax covers many sectors, increased coordination between the central government and related ministries is needed. Local governments should also be strengthened to prevent corruption and bribery.

To minimise economic distortions caused by the carbon tax, the government needs to implement accompanying policies, such as incentives for the development of renewable energy sources. This policy allows producers to use environmentally friendly energy so that product prices do not increase significantly and do not reduce public consumption. If there are no incentives, producers may prefer to pay the carbon tax rather than reduce emissions, which hinders efforts to reduce the use of high-emission energy.

Preserve Company Competitiveness

The implementation of a carbon tax can be controversial because it has the potential to reduce economic growth, reduce social welfare, and damage industrial competitiveness (Selvi et al., 2020). This tax will directly affect industrial sectors such as mining, construction, and energy, increasing production costs as well as electricity and transportation prices. The impact is felt by the community as the end consumer.

The increase in the cost of production can affect the competitiveness of products, both in the domestic and international markets. If a company is heavily dependent on fossil fuels, the carbon tax will have a major impact on its business. However, if not, the impact may not be significant. To maintain competitiveness, industries need to obtain incentives. Policies such as carbon dividends, as implemented in Sweden, can help offset the impact of rising electricity costs on people's purchasing power (Salim & Sidiq, 2022).

The Indonesian government must consider several things before implementing a carbon tax policy, including the speed of implementation and how this policy is enforced. A carbon tax can increase the selling price of goods and services related to carbon emissions in the production process, affecting the level of public consumption (Maghfirani et al., 2022).

Evaluation, Review, and Adjustment

Indonesia is on track to implement a carbon tax policy to reduce greenhouse gas emissions and preserve the environment. The use of taxes for environmental issues began to emerge during the administration of President Susilo Bambang Yudhoyono as an effort to achieve sustainable economic growth while considering environmental conditions. However, this policy has not been implemented due to rejection from entrepreneurs and the many taxes that have been imposed.

The government of President Joko Widodo plans to implement a carbon tax through Presidential Regulation No. 98 of 2021, which is applied to goods and services that emit

emissions. This carbon tax policy was passed through the HPP Law but was postponed twice, initially from April 2022 to July 2022, and then postponed again. This postponement was because the government was still draughting and implementing regulations, considering the readiness of the taxed sectors and the economic conditions of the community.

The implementation of public policies such as carbon taxes is influenced by the political system. In Indonesia, the involvement of entrepreneurs in politics makes the implementation of a carbon tax difficult due to conflicts of interest. Entrepreneurs involved in politics may reject this tax to protect their businesses, slowing down the implementation of the carbon tax (Tjoanto & Tambunan, 2022).

One way to ensure that carbon tax is implemented properly is to implement it gradually. According to (Tjoanto & Tambunan, 2022), there are three efforts to implement carbon tax in stages. First, introduce carbon tax in several sectors producing GHG emissions first, before being applied to all sectors producing emissions starting in 2025. Second, once well received, carbon tax rates can be increased gradually with periodic evaluations. Third, good management of carbon tax revenues can increase public support and be used for environmentally friendly energy investments and low-emission technology innovations.

Information Dissemination

Effective carbon pricing requires a comprehensive strategy that includes public dialogue, transparency, and scientific evidence (OECD, 2010). Public dialogue with stakeholders is essential to understand their needs and build support for the policy. Transparency in communicating carbon tax policies is essential to building public trust. Policymakers should clearly explain all aspects of the plan, including revenue allocation, distributional implications, and strategies to address negative impacts (Heine & Black, 2018).

Active stakeholder engagement in the design and implementation of carbon tax policies is essential to ensuring that the policy is fair and effective. This can be done through public consultations, workshops, and social and economic impact analyses (OECD & WBG, 2015). Ongoing stakeholder engagement programs are needed to raise public awareness of the benefits of carbon pricing through channels such as media campaigns and educational materials (Cottrell et al., 2016). Scientific evidence on the environmental and health impacts of pollution, as well as the benefits of carbon taxes, is essential to convince the public and stakeholders of the need for such policies (Heine & Black, 2018). Public awareness of the impact of carbon can also initiate public carbon awareness activities, such as community service through planting trees for carbon offsets in order to mitigate climate change (Aji et al., 2024).

CONCLUSIONS

Conclusions

The Indonesian government has an obligation to establish an effective carbon tax policy to reduce greenhouse gas emissions and combat climate change. In this regard, setting clear objectives is essential, including CO2 emission reduction and state revenue mobilization. However, challenges in implementing a carbon tax in Indonesia include limited data and capacity, as well as social impacts that may be detrimental to the poor. To overcome these challenges, the government needs to build technical and financial systems, pay attention to good administration, and design a carbon tax policy with social justice. Subsidy reform is an important first step towards implementing an effective carbon tax, by limiting the consequences of changes and increasing support for long-term reform. Good administration and coordination between ministries are also essential in implementing a carbon tax, as well as efficient use of carbon tax revenues to keep costs low. The tax base and rate are also important considerations in this policy, as well as coordination of government policies and institutions. Collaboration between financial and tax institutions is also needed to support better carbon emission reporting

and efficient carbon tax implementation. Therefore, overall, the successful implementation of a carbon tax in Indonesia requires close cooperation between the government, financial institutions, tax institutions, and entrepreneurs to achieve the goal of reducing greenhouse gas emissions and supporting sustainable economic growth.

Research Limitations

The discussion of the carbon tax implementation framework provides an overview of how to implement a carbon tax in Indonesia. However, this study has several limitations. First, this study only focusses on the aspects contained in the carbon tax implementation framework for developing countries. Further research can expand the aspects and discussions to elaborate more deeply so as to gain a more comprehensive understanding of the optimisation of carbon tax implementation in Indonesia. Second, this study does not involve in-depth analysis of related concrete data, so that further research can explore more about the aspects that need to be done to achieve optimisation of carbon tax implementation in Indonesia. In addition, the literature review research method used in this study is also a limitation because it is not very strong scientifically. The data sources used in this study are also limited to secondary data sources obtained online. Moreover, there is high subjectivity in selecting data sources because each researcher's perspective is different.

Suggestions

Based on the findings and limitations of this study, several suggestions can be put forward for policymakers in achieving optimisation of carbon tax implementation in Indonesia. The Indonesian government needs to design a carbon tax policy that encourages revenue mobilisation and the transition to a green economy. Then ensure that carbon tax policies are fair and protect the poor and vulnerable. Then build a system to monitor emissions and implement carbon taxes. In addition, the government must raise public awareness about the benefits of carbon taxes and the importance of combating climate change. Suggestions for further research are to be able to collect and use more accurate data on optimising the implementation of carbon taxes in Indonesia. In addition, further research is expected to be able to complement the limitations by using primary data sources that can be obtained through interviews or focus group discussions with policymakers and stakeholders.

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