THE IMPLEMENTATION OF CARBON DISCLOSURE HAS POTENTIAL IMPACT ON LOCAL OWN-SOURCE REVENUE : CASE STUDY OF KALIMANTAN

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ABSTRACT

Carbon disclosure plays a crucial role in mitigating greenhouse gas emissions and tackling climate change threats. This study examines the possibility of generating local own-source revenue by implementing carbon disclosure in Kalimantan, a major province in Indonesia. This study approach involves modeling the effects of measured emission taxes by utilizing carbon emission data from six energy sector firms operating in the Kalimantan region and listed on the IDX platform for the period of 2019-2023. This study aims to identify major corporations operating in the region and conduct a comprehensive analysis of the impact of carbon disclosure on regional income. The study findings suggest that carbon disclosure can enhance local own-source revenue through multiple mechanisms, such as generating carbon tax revenue, attracting foreign investment, and augmenting firm value.

Keywords: Carbon Disclosure, Local Own-Source Revenue, Kalimantan, Indonesia, Mapping.

1. INTRODUCTION

Indonesia has an abundance of natural resources. Some examples of these natural resources include petroleum, forests, mining, natural gas, coal, gold, silver, tin, nickel, and several more. Every sector covered by these natural resources has a significant economic impact on the nation. In this regard, the energy industry has a significant influence. In 2022, the Central Statistics Agency (BPS 2023) stated that the mining sector accounted for 12.22% of Indonesia's economic growth. Furthermore, the mining industry has the potential to increase the community's regional revenue and per capita income (Suciadi et al., 2020).

Nevertheless, despite the many advantages gained, it is indisputable that the rapid development of the mining industry has also had substantial adverse effects on the environment, society, and ecosystem. The widespread mining operations in several locations of Indonesia have unquestionably led to significant environmental deterioration. Incidents of this nature have occurred in several locations in Indonesia, including the recent one in South Kalimantan in 2021. The company's excessive dredging activities in the region led to the flood catastrophe and significant environmental devastation. Regrettably, this catastrophe led to the loss of 24 lives and the displacement of 113,000

people. The coal company PT. Kanyan Putra Utama Coal (KPUC) in Malinau, North Kalimantan, has caused environmental pollution by allowing the waste reservoir embankment to collapse, contaminating the Malinau River. Consequently, the river water became turbid and a significant number of deceased fish were discovered (Syahni et al., 2021).

Furthermore, the operational activities that generate substantial quantities of carbon dioxide also contribute to the occurrence of global warming. The primary cause of climate change is the escalating amounts of carbon dioxide resulting from a multitude of activities conducted at both the individual and communal levels (Cadizza, R. et al., 2024). Carbon dioxide emissions will also contribute to global warming and climate change on Earth. Operating vehicles such as trucks, heavy equipment, and mining vehicles that rely on fossil fuels generate carbon dioxide emissions at a basic level. Furthermore, the use of diesel generators for power provision at mining sites, combined with combustion activities for heating, contributes to greenhouse gas emissions.

On a macroscopic scale, the processes involved in the exploration and extraction of minerals or coal require huge machinery that consumes significant quantities of fossil fuels. For mineral extraction and processing, industrial facilities require significant energy consumption, often sourced from fossil fuels. Large vehicles, trains, and ships emit carbon dioxide during the transportation and distribution of mining resources. Opening mining sites triggers the deforestation process, which releases stored carbon in plants and soil into the atmosphere. Moreover, coal-fired power stations, closely associated with coal mines, significantly contribute to the emission of carbon dioxide.

Utilizing mining goods like coal in power plants results in the generation of substantial quantities of carbon dioxide, which has long-term environmental implications. In addition, mining operations frequently harm the surrounding ecosystem, diminishing the environment's inherent ability to absorb carbon dioxide via the process of photosynthesis. Hence, mining enterprises must contemplate strategies for mitigating carbon dioxide emissions, such as adopting eco-friendly technology, optimizing energy consumption, and dedicating resources towards carbon sequestration efforts, in order to diminish the adverse effects of their operations on climate change. The impact of this issue will extend beyond Indonesia, as the carbon dioxide emissions from industries will have a negative impact on neighboring nations. Even nations that do not emit carbon dioxide will experience the negative consequences of global warming.

The Paris Agreement is an international endeavor dedicated to addressing the issue of climate change, thriving within the framework of the United Nations Framework Convention on Climate Change (UNFCC). The agreement prioritizes the reduction of carbon dioxide emissions, with implementation set to begin in 2020. An additional factor that contributes to responsibility and environmental awareness is the endorsement of the Kyoto Protocol by almost all nations globally,

including Indonesia (Wahyuni, 2021). Indonesia has pledged to decrease carbon emissions by 26% by 2020 and then raise them by three percent by 2030. The implementation of Presidential Regulation No. 61 of 2011, which outlines the national strategy for reducing greenhouse gas emissions, demonstrates Indonesia's commitment to decreasing carbon emissions. Furthermore, the monitoring and documentation of the country's national greenhouse gas inventory is the focus of Presidential Regulation No. 71 of 2011. Furthermore, Presidential Regulation No. 47 of 2012 places emphasis on the social and environmental obligations of limited liability companies.

The ratification conducted by the Indonesian Government indicates Indonesia's progress as a growing nation, encountering budgetary limitations for development projects backed by the State Budget, similar to other nations (Irama, A. B., & SE, M., 2020). In order to sustain this expansion, Indonesia needs financial resources that can provide long-term support for the state budget. It is desirable for both affluent and developing nations to participate in the competition to identify funding sources for sustainable development. Developed nations have effectively allocated the income from carbon emissions solely to finance efforts aimed at mitigating carbon emissions (Elsa, H. U., & Utomo, R., 2022). Indonesia could replicate these developed nations' practices by adopting a carbon tax policy to generate income for the national budget. This measure will have a positive effect on regional gross domestic product (GDP).

2. LITERATURE REVIEW

2.1 Mitigating Climate Change Risks and APBN Limitations

Climate change is a worldwide issue that significantly affects all facets of life, including the economy, health, and the environment. Climate change in Indonesia has resulted in a multitude of issues, such as a heightened frequency and intensity of natural calamities, alterations in precipitation patterns, and an elevation in sea levels.To mitigate the most severe consequences of climate change, it is imperative to limit worldwide carbon emissions until 2050. By 2050, it is projected that industrial processes will achieve full decarbonization. The government should promptly address and effectively manage all of these issues (Nusantara, I. K., 2022).

The Indonesian government is actively working to combat climate change by consistently reducing greenhouse gas (GHG) emissions. The Paris Agreement, which has received formal approval from 190 other nations globally, mandates the quick implementation of greenhouse gas (GHG) emission reduction. Indonesia has established a goal of decreasing greenhouse gas (GHG) emissions by 29% by 2030 alone, and a goal of 41% with collaboration from diverse international partners (Anggraini, U., Wijaya, S., & Lathif, S., 2023).

Nevertheless, the Indonesian government necessitates a substantial investment of financial resources to efficiently execute mitigation and adaptation actions with the objective of diminishing greenhouse gas (GHG) emissions. According to reports from the Ministry of Environment and Forestry (2018) and the Ministry of Finance (2019), the Indonesian government needs a total funding of USD 247.2 billion in order to achieve its goal of lowering greenhouse gas emissions by 2030. This sum is valued at IDR 3,708 trillion, calculated using an exchange rate of IDR 15,000 per USD. Nevertheless, the State Budget (APBN) does not provide sufficient funds to adequately address the financial requirements of mitigating climate change. According to the Ministry of Finance (2020), the APBN allocates an average of IDR 102.65 trillion annually for climate change, representing 4.3 percent of its total spending. This demonstrates the need for the government to acquire supplementary funding in order to efficiently carry out actions aimed at reducing greenhouse gas emissions and adapting to the consequences of climate change, with the objective of achieving emission reduction goals.

2.2 Carbon Emissions Through the Implementation of Carbon Tax Policy

An effective measure to tackle climate change, especially for organizations and industries with significant contributions to greenhouse gas emissions, is to advocate for carbon disclosure. A carbon tax is a policy tool used to mitigate the release of greenhouse gas (GHG) emissions and address the issue of climate change (Selvi, S., Rahmi, N., & Rachmatulloh, I., 2020). A carbon tax is an economic instrument that levies a charge on the emission of carbon dioxide (CO2) or other greenhouse gases. The objective is to incentivize corporations and communities to decrease their emissions, therefore fostering the development of inventive clean technology and advocating for more environmentally friendly practices.

The implementation of a carbon tax is founded on the basic principle that individuals or entities who contribute to pollution should assume financial responsibility for the harm they inflict upon the environment. This concept is sometimes known as the "polluter pays principle." The objective of this tax is to determine a monetary worth for carbon emissions that precisely reflects the societal consequences of carbon pollution. Governments aim to mitigate emissions and encourage the adoption of cleaner technology via the implementation of carbon pricing schemes, which raise the financial burden associated with pollution. Carbon taxes may be implemented at various points in the production and consumption cycle, ranging from fossil fuel manufacturers to final consumers. There are two primary approaches to establishing carbon taxes: fuel-based taxes and emission-based taxes (Pamungkas, B. N., & Haptari, V. D., 2022). gasoline-based taxes are levied on the sale of gasoline based on its carbon content, while emission-based taxes are directly imposed on the greenhouse gas emissions generated. The effectiveness of carbon taxes in reducing climate change relies on several

factors, including policy development, the level of the carbon price, the distribution of tax revenues, and the existing economic and social circumstances of the implementing nation.

a) Policy Formulation

The effectiveness of carbon prices is significantly impacted by the design of policies. Insufficiently low taxes may not sufficiently motivate the reduction of emissions, but excessively high taxes might impose a heavy cost on the economy and provoke political resistance. Moreover, the extent of the tax is crucial; the broader the spectrum of businesses and gases subject to taxation, the greater the probability of decreasing emissions.

b) Carbon Pricing Threshold

The carbon price's size is another crucial aspect. In order to bring about significant shifts in behavior and technology, it is necessary to impose a significant cost. Studies have shown that insufficiently elevated carbon prices fail to motivate the transition from fossil fuels to renewable energy sources. Thus, finding the appropriate price necessitates achieving a peaceful equilibrium between incentivizing environmental development and maintaining economic stability.

c) Allocation of Tax Revenue

The allocation of carbon tax funds also impacts the effectiveness of the program. The funds collected might be used to fund sustainable energy programs, enhance energy efficiency, or provide compensation to low-income people who would be negatively impacted by increasing energy expenses. Efficient distribution of cash may enhance public support for carbon pricing and alleviate the economic strain on susceptible communities.

d) Economic and Social Conditions

The efficacy of a carbon tax policy is contingent upon the existing economic and social factors in the nation of implementation. Nations with robust economies possess a stronger ability to enforce higher carbon taxes without experiencing significant economic repercussions. Nevertheless, in underdeveloped nations, it may be necessary to adapt this approach in order to prevent negative consequences on economic growth and levels of poverty.

It is crucial to include a fairness viewpoint into the carbon pricing program. A high level of commitment is crucial for successfully implementing this program, particularly in the development of rules pertaining to carbon trading. Emphasizing the consistency of environmental policies throughout various political regimes is crucial, and this may be accomplished by continuously taking into account the RPJP (Long-Term Development Plan) and RPJMN (National Medium-Term Development Plan).

Nevertheless, the execution of carbon pricing has faced several impediments. Presently, the disclosure of carbon emissions remains discretionary, indicating that firms are not required to provide

this information to stakeholders (Muhtar, S. M., 2023). The absence of responsibility stems from causes such as political resistance, economic repercussions, and the need for global collaboration. Political pushback often originates from the industries that are most impacted and from civil society groups that express worries over the increasing expenses of life. Some nations are worried that introducing carbon pricing might harm their economic competitiveness, particularly if other countries don't enact similar policies. Moreover, the challenge of international coordination poses a substantial barrier, since greenhouse gas (GHG) emissions are a worldwide concern. In the absence of proper coordination, there is a risk of "carbon leakage," which occurs when companies move their manufacturing to countries with less strict carbon rules, so undermining the efficacy of global policy. In line with the HPP Law, the Indonesian government has introduced a carbon tax as a means to tackle the issue of carbon emissions. Nevertheless, the law just offers broad directives for executing the carbon tax, without explicit instructions on determining tax rates according to carbon market prices and the carbon tax base. Therefore, the adoption of carbon pricing in Indonesia is now awaiting resolution. To fully comprehend the possible financial impact of the carbon tax and the resulting decrease in carbon emissions resulting from its implementation, it is necessary to evaluate these effects by drawing on the experiences of other nations.

The 2022 Macro Policy Framework and Fiscal Policy Principles (KEM & PPKF) document is part of the Draft Law on the Fifth Amendment to Law Number 6 of 1983, which focuses on General Provisions and Tax Procedures (KUP). Under the given macroeconomic and fiscal policy framework, the government plans to introduce Indonesia's carbon tax at a rate of IDR 75 per kilogram of carbon dioxide equivalent (CO_2e). A novel clause in the legislation currently governs the regulation of the carbon price. The carbon tax rate is fixed at a minimum of IDR 30.00 per kilogram of carbon dioxide equivalent or equivalent unit. So it is taken as 30 Rupiah/ton. The calculation, if equated with the carbon tax units applied by other countries, namely units per ton, then Indonesia's carbon tax is:

1 ton = 1000 kg

Carbon Tax = Rp30 / kg CO_2e

= (Unit of weight x Tariff per kg)

= 1000 x Rp30

= Rp30.000 per ton of carbon emissions.

3. METHODOLOGY

3.1. Research Design

The methodology used in this study refers to Thalmann (1997), where the amount of carbon tax is calculated using the formula:

Ti = Pi x Wi

Where:

Ti = The Amout of Carbon Tax Revenue

Pi = Tax Tariff

Wi = The Amount of Firms Carbon Emissions

3.2. Sample

This study uses secondary data, because it comes from CSR reports of companies listed on www.idx.co.id. The issuer companies that are the sample of research data come from 6 energy sector companies located in the Kalimantan region and are listed on IDX and publish CSR reports during the period 2019-2023.

There are 6 firms listed on IDX include the following:

1. PT Adaro Energy Tbk (ADRO)
2. PT Bayan Resources Tbk (BYAN)
3. PT Indo Tambangraya Megah Tbk (ITMG)
4. PT Harum Energy Tbk (HRUM)
5. PT Astra Agro Lestari Tbk (AALI)
6. PT London Sumatra Indonesia Tbk (LSIP)

3.3. Data Analysis

This study uses simulation to calculate the amount of tax on carbon emissions using the observed emission tax methodology. Under this methodology, the tax is determined by simply multiplying the tax rate by the total measurable carbon emissions, since carbon emissions are essentially negative externalities or environmental damage.

4. RESULTS AND DISCUSSION

4.1. Result

The implementation of simulations to identify potential local own-source revenue related to carbon emissions produces the table below:

Table 1

Potential local own-source revenue from Carbon Emissions for the Period 2019-2023 (Rp Million).

No	Firm's Name	Potential Carbon Tax Revenue	%

1	PT Adaro Energy Tbk (ADRO)	232,316,520,000	8.73
2	PT Bayan Resources Tbk (BYAN)	192,861,416,700	7.25
3	PT Indo Tambangraya Megah Tbk (ITMG)	2,069,821,020,000	77.78
4	PT Harum Energy Tbk (HRUM)	3,923,592,000	0.15
5	PT Astra Agro Lestari Tbk (AALI)	162,138,630,000	6.09
6	PT London Sumatra Indonesia Tbk (LSIP)	171,810,000	0.01
	Total	**2,661,232,988,700**	**100.00**

Source :CSR Report

Table 1 displays the outcomes of the computation of potential regional income derived from six enterprises operating in the Kalimantan area. It is assumed that these companies would be subjected to a carbon emission tax amounting to IDR 30,000 for each metric ton of carbon emissions. The tax rate is determined by the 2022 Macro Policy Framework and Fiscal Policy Principles (KEM & PPKF). The provided table presents a comprehensive summary of the possible income that the Kalimantan regional government may generate via the implementation of a carbon tax policy. Over a span of five years, the six primary energy sector enterprises operating in the Kalimantan area generated a total combined local own-source revenue of IDR 2.66 trillion. Moreover, corporations involved in the energy sector have a crucial role in making a substantial carbon tax payment to the local government. In this situation, the tax amount is directly correlated with the extent of environmental harm inflicted.

4.2. Discussion

PT Indo Tambangraya Megah Tbk (ITMG) accounted for the highest share, contributing 77.78% of the total potential income from carbon tax. PT Indo Tambangraya Megah Tbk (ITMG) contributes substantial carbon tax money to the regional government, while also causing adverse environmental effects. The company's operating operations include the extraction of the whole topsoil above the mine deposits, leading to a comprehensive alteration in both climate and soil composition. Furthermore, the depletion of natural vegetation eradicates the function of forests as regulators of water management, erosion control, floods, carbon sequestration, oxygen provision, and temperature regulation.

There is a possibility that the money generated by carbon tax may be more. The provided data is a simulated representation of the performance of six prominent energy sector firms in Kalimantan. These companies are listed on the IDX and have submitted CSR reports. Aside from contemplating money creation, the government must also give precedence to addressing the repercussions of the environmental degradation incurred. This tendency is intriguing given that this research only examines six prominent energy sector corporations that operate in the Kalimantan area. Nevertheless, it is

crucial to acknowledge that this does not eradicate the potential for augmenting carbon tax income from illicitly operating mining businesses that have not been identified.

In order to fill this need, we will analyze existing governmental efforts that promote the practicality of introducing a carbon price policy in Indonesia. Under this circumstance, the objective of this program is to provide inducements to firms in order to motivate them to reveal their carbon emissions. The Financial Services Authority introduced the Sustainable Finance Program in 2017. In accordance with the Financial Services Authority Regulation (POJK) number 51/POJK.03/2017, it is mandatory for business entities such as Financial Services Institutions, Issuers, and Public Companies (Tbk) to provide a Sustainability Report to the OJK as a component of sustainable finance implementation. A sustainability report is an extensive document that provides a detailed overview of a business organization's economic, financial, social, and environmental performance. This report encompasses the process of recording environmental, social, and governance (ESG) actions in order to adhere to responsible investing principles and manage social and environmental risks. One entry in the ESG report pertains to the amount of carbon emissions generated by a business organization or firm as a result of its activity. While the present number of Indonesian corporate entities that publish their carbon emissions is low, the release of this POJK demonstrates the government's proactive engagement in promoting environmental conservation among commercial organizations in Indonesia. The OJK has substantial difficulties in motivating enterprises to reveal their carbon emissions.

5. CONCLUSION

According to calculations conducted by six energy firms listed on the IDX for the period of 2019-2023, the introduction of a carbon tax in Kalimantan has the potential to produce regional income of IDR 2.66 trillion over a span of five years. PT Indo Tambangraya Megah Tbk (ITMG) made the biggest contribution, accounting for 77.78% of the total potential income. Carbon disclosure plays a crucial role in mitigating greenhouse gas emissions and tackling climate change concerns. This disclosure has several advantages, including environmental benefits and the potential to generate regional cash via methods like carbon tax revenue, attracting international investment, and enhancing corporate value. The energy sector, particularly mining, makes a substantial contribution to economic development and regional prosperity. However, it is crucial to effectively address the adverse environmental consequences associated with this activity. Acquiring business carbon emission data is difficult in comparison to country-level data due to the need for financial resources to support research, since corporate carbon emission data is not yet accessible without cost. This fact poses a hindrance or inadequacy in this investigation. Nevertheless, there are several corporations who do not disclose their carbon emissions to the appropriate regulatory bodies. Many companies are hesitant to reveal their carbon emissions because they believe that such emissions are seen as shameful and should be kept

confidential. Moreover, according to Timo et. al (2012), carbon emissions are increasingly seen by investors and business stakeholders as a possible financial risk that might negatively impact company performance.

A well crafted and executed carbon tax is an exceedingly potent policy tool for mitigating greenhouse gas (GHG) emissions and tackling climate change. The effectiveness of it relies on several factors, including as the development of policies, the extent of carbon pricing, the distribution of money, and the existing economic and social conditions. Empirical data from several nations indicates that carbon taxes may efficiently decrease emissions and promote economic growth, as long as they are customized to suit the unique conditions of each area.

Despite encountering obstacles, notably in terms of political resistance and international collaboration, carbon taxes remain a crucial instrument in global endeavors to tackle climate change. nations that have implemented carbon pricing might provide valuable information for nations contemplating the adoption of similar policies. Robust public and political backing, along with a transparent and equitable approach to using tax revenues, are important elements to guarantee the efficient execution of these initiatives.

According to the findings of the research about the possible income generated by the adoption of a carbon tax at a regional level, below are some recommendations that might be taken into account:

1. The local governments in Kalimantan should promptly establish effective and transparent partnership with the national government to implement and supervise carbon tax regulations. Rigorous oversight and unwavering enforcement of laws are crucial to guarantee that energy businesses adhere to relevant rules.
2. Partnership with energy corporations: The government should collaborate with energy firms to devise efficient measures for reducing emissions. This may include offering incentives to organizations that effectively decrease their carbon emissions, along with offering technical and financial assistance for environmentally friendly efforts.
3. Promoting Awareness and Education: Enhancing public and stakeholder understanding on the significance of decreasing carbon emissions and the advantages of adopting a carbon price. Education programs and public campaigns have the potential to alter behavior and provide assistance to government objectives.
4. Allocation of Carbon Tax Funds: The funds derived from the carbon tax must be effectively directed towards environmental programs and the promotion of sustainable development. Allocating funds towards renewable energy, waste management, and natural resource conservation may effectively mitigate the adverse environmental effects caused by industrial activities.

5. Establish a perpetual monitoring and evaluation mechanism to gauge the efficacy of carbon price implementation. The obtained data may be used to enhance policies and pinpoint areas that need improvement.
6. Economic Diversification: Mitigate reliance on the energy sector via the cultivation of other industries that are more ecologically sustainable. Implementing economic diversification strategies may effectively mitigate the adverse environmental effects associated with the energy sector while also generating novel and sustainable employment prospects.

Local governments should not only prioritize local own-source revenue when considering the draft implementation of the tax policy, but they should also intensify their monitoring efforts to reduce carbon emissions. This is crucial in order to mitigate the risk of environmental damage and climate change.

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