Potential Acceptance of Carbon Tax on Blue Economy Development in Indonesia

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Abstract. One tool for internalizing the external costs of greenhouse gas emissions into the price of fossil fuels is a carbon tax. Promoting the decrease of carbon emissions and the switch to greener, cleaner energy sources is its primary goal. Given its enormous carbon emissions, Indonesia has a large potential cash stream from carbon taxes. It is anticipated that Indonesia's adoption of a carbon price will help realize the Sustainable Development Goals (SDGs), especially regarding the growth of a blue economy or sustainable marine industry. This study employs a qualitative approach through the utilization of the literature study method. The findings demonstrate that the introduction of a carbon tax can stimulate the shift in the marine industry toward more ecologically friendly methods while also serving as a funding source for initiatives aimed at marine conservation, research and development projects related to marine technology, and infrastructure that supports the blue economy.

Keywords: Carbon Tax, Carbon Emissions, Blue Economy, Sustainable Marine Economy, Sustainable Development Goals (SDGs).

1. Introduction

Humanity is currently facing one of the biggest problems faced, namely weather changes. Carbon dioxide (CO2) is a gas that contributes to greenhouse gases and greatly influences the earth's climate. The climate changes that occur are largely caused by human activities. The activity of burning fossil fuels such as coal, petroleum and natural gas releases a lot of CO2 into the atmosphere, producing a thick layer of greenhouse gases that trap the sun's heat in the atmosphere. As a result of these activities, the earth's temperature increases and there are significant changes in weather patterns and ecological systems. (Antarissubhi et al., 2023)[1].
According to the OECD (2020), climate change will have a negative impact on biodiversity, human survival, food production and living ecosystems. Therefore, the United Nations has reached an agreement to reduce carbon emissions worldwide through the United Nations Framework Conventions of Climate Change. This agreement was signed in Paris France on April 23 2016 by 195 UN member countries, including Indonesia. Based on the agreement that

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became known as the Paris Agreement, all countries that are members of the UN are required to reduce their greenhouse gas emissions [2].

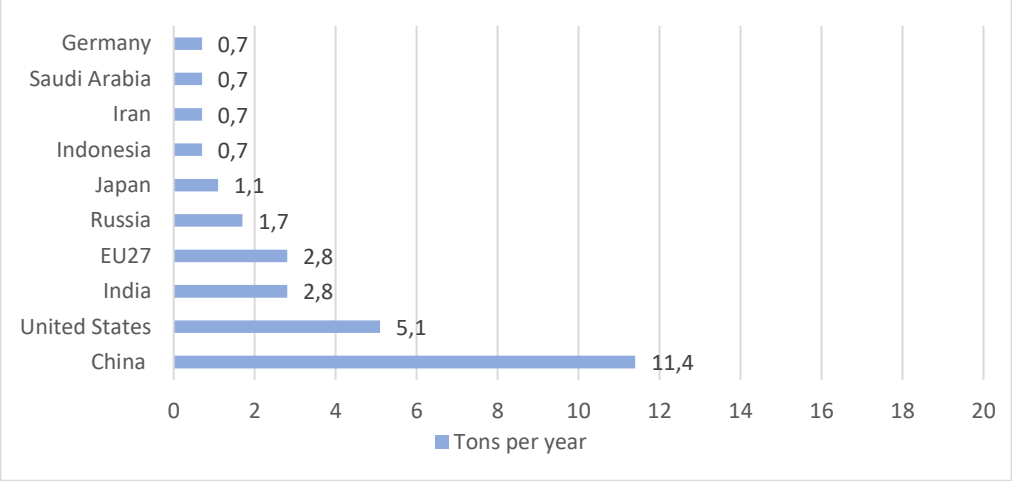

Figure 1. Countries producing the largest carbon emissions in the world

Based on the data above, the amount of carbon dioxide produced by Indonesia throughout 2022 will reach 700 million tons. This figure increased by 18.3% compared to the previous year, this is the highest increase compared to other countries. According to the report, the increase in Indonesia's carbon emissions is caused by the use of fossil energy, especially coal. Another source is land conversion and high levels of deforestation in Indonesia [3]. To reduce the negative effects produced by carbon emissions, the government has implemented a Pigouvian carbon tax to achieve low-carbon development. The government has issued Law Number 7 of 2021 concerning Harmonization of Tax Regulations (UU HPP) to regulate the imposition of carbon tax. According to the Republic of Indonesia Law of 2021, carbon tax is imposed on purchases of goods containing carbon or activities that produce carbon emissions.

Several countries have demonstrated innovative approaches to addressing the complexities of implementing carbon taxes. For example, Sweden has proven successful in implementing an effective carbon tax through a gradual strategy. The country introduced a carbon tax in 1991 and has consistently increased the rate over time. As a result, Sweden has succeeded in reducing carbon emissions while maintaining solid economic growth. On the other hand, Canada offers a different perspective on addressing the carbon tax challenge. The country is adopting a more flexible and diversified approach, taking into account the unique characteristics and specific needs of each of its provinces in implementing its carbon tax policy [4].
In the development of a blue economy or sustainable marine economy, carbon taxes can play an important role in encouraging a transition towards more environmentally friendly marine industry practices. Due to the significant role of the ocean in climate change, marine ecosystems and the fishing industry must be a top priority in the concept of sustainable development (SDGs)

[5]. One way to protect the environment while increasing national income is to implement a carbon tax. State income is obtained as compensation for the negative image of the environment produced by parties who pollute the environment [6]. As has been done by other countries, Indonesia must estimate the possibility of receiving a carbon tax and reducing carbon emissions as a result. With the implementation and receipt of the carbon tax, it is hoped that it will be able to develop the potential of a blue economy in Indonesia. Based on the explanation above, in this research the author will analyze "POTENTIAL ACCEPTANCE OF CARBON TAX ON BLUE ECONOMY DEVELOPMENT IN INDONESIA"

2. Literature Review

2.1. Tax

According to Law No. 28 of 2007, tax is a mandatory contribution to the state owed by an individual or entity that is coercive based on law without receiving direct compensation and is used for state needs for the greatest prosperity of the people.
Individuals or entities who pay, withhold or collect taxes are referred to as Taxpayers (WP). They have tax rights and responsibilities that are regulated in applicable tax laws and regulations [7].

2.2. Carbon Emissions

Currently, global attention is focused on the consequences of increasing Earth's temperature or global warming. This phenomenon is caused by increasing levels of gases that trigger the greenhouse effect in the atmosphere [8].Carbon emissions consist of carbon dioxide and other GHG products that can be converted to carbon dioxide equivalents [9]. CO2, CO, Methane, NO2, and CFCs are four greenhouse gases that increase the GHG effect. Because CO2 is released through human activities such as burning fossil fuels, burning forests, industrial activities. Over the last century CO2 has increased and driven climate change (Global Change, 2023). CO2 carbon emissions will increase by 1.1% in 2023. The increase in Co2 in 2023 is far from the drastic reduction required to meet the global climate goals set in the Paris agreement. Co2 emissions reached a record high of 37.4 gigatons in 2018 [10].

2.3. Carbon Tax

According to the IBFD International Tax Glossary (2015), a carbon tax is a levy applied to the use of fossil fuels. In essence, the implementation of this tax will impose additional costs for fuel consumption. The main goal of a carbon tax is to reduce emissions of carbon dioxide and greenhouse gases, as part of efforts to combat global warming. Carbon tax is included in the Pigouvian tax category. This term refers to levies imposed on economic activities that have a negative impact on other parties or the environment. The obligation to pay carbon tax arises

when someone buys products that contain carbon elements, or when carrying out activities that produce carbon emissions in a certain quantity over a certain period of time [7].

a. Carbon tax subject : are those who produce carbon emissions directly and who consume carbon-containing products. Both individuals and business entities can fall into this category.
b. Carbon Tax Object : namely fossil fuels, such as coal, diesel oil and gasoline, are examples of fuels that can be taxed because they produce carbon emissions originating from industry, factories or motorized vehicles.
c. Indonesian carbon tax rates **:** The lowest tariff is 30 rupiah per kilogram of carbon dioxide equivalent (CO2e) or 30 thousand rupiah per ton of CO2e or the equivalent of 1.93 rupiah per ton of CO2e. This rate is lower than the initial recommended rate of 75 rupiah per kilogram of CO2e. Therefore, Indonesia is among the countries with the lowest carbon tax rates in the world.

2.4. Blue Economy

According to the Ministry of Maritime Affairs and Fisheries (2012), the "blue economy" is an economic development model that combines land and ocean development with a focus on optimizing technology to increase the use of marine resources. The blue economy, also referred to as the ocean economy or maritime economy, refers to the sustainable use of marine resources to boost the economy, improve people's lives, and maintain the health of marine ecosystems. Some blue economy sectors include fisheries, aquaculture, shipping, energy, tourism, and marine biotechnology. Today, many people, including policymakers, academics and various stakeholders, are paying attention to the potential of the blue economy to enhance sustainable development and reduce poverty levels. Indonesia has great potential to maximize the Blue Economy, which is intended to be a source of sustainable and inclusive growth for the Indonesian state [11].

2.5. Potential Carbon Tax Revenue

One way to increase national income and protect the environment is a carbon tax. Polluters have a negative impact on the environment which reduces state income. Indonesia has the option of using a carbon emissions and permits trading system (ETS) or a carbon tax known as the Cap-and-Trade Scheme system. Carbon tax, on the other hand, can be put forward in terms of implementation which is relatively easier [6]. Given that Sweden has implemented a carbon tax successfully, Indonesia also has the opportunity to optimize the revenue they receive from the carbon emissions tax. Funds received by the state can be reused for carbon emission reduction programs.

3. Research Method

This research uses qualitative methodology and conducts a literature review. This methodology is used to construct theories or hypotheses by revealing facts. The aim of this approach is to provide readers with information about previous studies and research on carbon tax implementation. As a source of information, secondary data used in this research was obtained from books, journal articles and internet websites [12].

4. Result and Discussion

The phenomenon of climate change is now the dominant factor behind various disasters that have hit almost all countries in the world [13]. Indonesia is an archipelagic country with more than 17,000 islands, very susceptible to the effects of climate change, such as sea level rise. The trend in Indonesia's temperature increase is around 0.03% per year from 1981 to 2018 (source BMKG). National greenhouse gas emissions increased by around 4.3% per year from 2010 to 2018. (Data Source: KLHK (2020), data processed). Indonesia's sea level is rising 0.8–1.2 cm per year, and around 65% of the population lives in coastal areas [14]. One of the serious consequences of climate change is damage to marine ecosystems. Increasing sea water temperatures result in the extinction of various vital organisms such as coral reefs, sea grass and mangrove forests. Apart from that, this phenomenon also threatens the existence of various marine species and damages the balance of the aquatic ecosystem as a whole [13]. Climate change continues to occur today, mostly caused by carbon emissions [15]. As one of the main contributors to global greenhouse gas (GHG) emissions, Indonesia is faced with complex problems due to the effects of climate change.Based on the BPS data below, it states that the amount of greenhouse gas emissions from various sectors tends to increase from 2000 to 2019.

Table 1. Total Greenhouse Gas Emissions from Various Sectors in the Period 2000 to 2019

Year	Sector						Amount
	Energy	IPPU	Agriculture	POLU	Forest fires	Waste	
2000	317,609	42,883	99,314	500,019	161,571	64,832	1,186,228
2001	341,919	48,269	97.124	144,329	50,885	67,602	461,470
2002	349,485	41,688	98,381	119,030	301,753	70,063	742,340
2003	378,050	41,402	99,652	130,833	132,075	73,061	593,407
2004	380,434	43,146	102,083	17,062	232,018	75,225	849,968
2005	376,988	42,296	103.227	33,119	258,887	77,216	891,733
2006	386,100	38,641	103,517	53,411	510,710	82,578	1,174,957
2007	402,989	35,919	105,991	161,799	62,747	83,933	853,378

Year	Sector						Amount
	Energy	IPPU	Agriculture	POLU	Forest fires	Waste	
2008	391,784	36,499	99,949	157,343	81,744	85,023	852,342
2009	405.653	37,546	105,087	259,880	299,920	89,326	1,197,412
2010	453,235	36,033	108.318	73,343	51,383	87,670	809982
2011	507,357	35,910	107,520	122,414	189,026	91,852	1,054,079
2012	540,419	40,078	112,058	249,442	207,050	95,530	1,244,577
2013	496,030	39,164	112,882	377,747	205,076	100,514	1,331,413
2014	531.142	47,489	112.801	215,318	499,389	102,834	1,508,973
2015	536,306	49,297	117,160	742,843	822,736	106,061	2,374,403
2016	538,025	55,307	122,185	417,385	90,267	112,352	1,335,521
2017	562,244	55,395	127,503	476,005	12,512	120.191	1,353,850
2018	595,665	59,262	110,055	602.188	121,322	127,077	1,615,569
2019	638,808	60,175	108,598	468,425	456,427	134,119	1,866,552

Source processed:[16].

According to government data, Indonesia has 75 to 80% of global carbon reserves, with mangrove forests contributing 20%.On the one hand, if fully utilized, opening the carbon market can increase foreign exchange reserves. In the first trading session, the Indonesian Stock Exchange recorded 27 transactions selling 459,953 tons of carbon units [17]. BPS data shows that Indonesia is the 3rd country with the longest coastline in the world. This condition holds enormous potential, both in terms of biological and non-biological resources. Indonesia's marine wealth is unrivaled globally, with a diversity of biota and abundant natural resources. Seeing these advantages, it is appropriate for Indonesia's economic development strategy to focus more on developing the marine sector and coastal areas. For this reason, it is necessary to impose a carbon tax so that Indonesian seas can continue to develop [18]. A carbon tax is one policy used to internalize external costs caused by greenhouse gas emissions into the price of fossil fuels. The aim is to reduce carbon emissions by increasing the price of high-carbon fuels [19].The implementation of a carbon tax has the potential to be an effective incentive for Indonesian people to reduce dependence on fossil fuels. It is hoped that this policy can motivate residents to switch and make more use of energy sources that do not damage the environment [20].

Three Mechanisms of Carbon Economic Value [21]:

a. Carbon trading: Emissions trading or cap-and-trade schemes are known as ETS. The first way is to set limits on total permitted greenhouse gas emissions. Companies or institutions that exceed the limit must pay a fine or purchase quotas from companies or institutions that have the excess. then quotas are reduced and emission reduction targets are tightened gradually. This encourages businesses to reduce emissions

through increasing energy efficiency, implementing low-carbon technology, and switching to renewable energy.

b. Carbon Tax: Unlike a cap-and-trade system, a carbon tax sets a price on carbon directly, not a limit on the volume of emissions. This type of tax is included in the carbon tax on imported goods imposed by the European Union: Carbon Border Adjustment Mechanism.
c. Carbon Credits: Carbon credits can be offered by businesses that successfully help reduce carbon emissions. One of these mechanisms is results-based payments, such as reducing emissions from Deforestation and Forest Degradation (REDD), which provides financial incentives to developing countries that succeed in reducing deforestation. Clean Development Mechanism (CDM), which involves investing in emissions reduction projects in developed countries to meet the Kyoto protocol targets. In this case Indonesia. Carbon offsets are included in carbon trading, although the method is similar to carbon credits.

From an economic perspective, implementing a carbon tax in Indonesia promises huge benefits. A carbon tax opens up new opportunities for state revenue, which the government really needs. Funds collected from these taxes can be used to fund long-term sustainable development initiatives. This allows the government to reduce dependence on other sources of income that may be less environmentally friendly. According to [22], carbon taxes also support the idea of a green economy and encourage a shift towards a low-carbon economy, thus supporting the concept of a blue economy. One way to support the development of the blue economy or marine economy is by imposing a carbon tax. According to research conducted by [23] a carbon tax has several benefits, namely:

a. Reducing Carbon Emissions
   Implementation of a carbon tax results in a significant financial boost. By increasing the price of carbon fuels, this policy motivates various sectors such as energy, shipping and industry to actively look for ways to reduce their carbon emissions.
b. Motivate the Use of Clean Energy Sources
   The implementation of a carbon tax has the potential to reduce dependence on fossil fuels. This policy can encourage the development and utilization of various energy sources, especially by encouraging the use of clean and renewable energy.
c. Technological Innovation and Improvement
   Implementing a carbon tax can spur innovation in renewable energy technology and low-carbon technology. The existence of economic incentives will encourage the business world and society to choose new solutions that are more efficient in reducing carbon emissions. This situation has the potential to accelerate the development of environmentally friendly technology, including research and development in the field of marine technology.
d. Income for Investment and Development
   Implementing a carbon tax can spur innovation in renewable energy technology and low-carbon technology. The existence of economic incentives will encourage the

business world and society to look for new, more efficient solutions in reducing carbon emissions. This situation has the potential to accelerate the development of environmentally friendly technology, including research and development in the field of marine technology.

Minister Suharso, Monday (18/12), said that the application of the blue economy concept has the potential to provide various significant benefits including protecting ecosystems and biodiversity, reducing greenhouse gas emissions by up to 20%, creating 12 million new job opportunities by 2030, as well as potential investment profits. in the sustainable marine sector which reached USD 15.5 trillion. The Ministry of National Development Planning/Bappenas developed the Indonesian Blue Economy Roadmap Edition II with four main pillars for sustainable and inclusive blue economy development. This roadmap aims to overcome various obstacles that will arise in the implementation of the blue economy in Indonesia. First, maintaining the condition of the sea so that it remains healthy, strong and capable of producing resources; second, encouraging economic development that pays attention to environmental sustainability; third, improving the level of health, welfare and prosperity for all levels of society; and finally, creating a generally supportive environment [14].

The implementation of a carbon tax can be seen as a strategy that offers two benefits at once, namely protecting the environment and increasing state income. Through this system, the state obtains financial compensation for the negative impacts caused by parties who produce pollution [6]. Revenue obtained from the imposition of a carbon tax can be allocated for various strategic purposes. First, these funds can be used to finance research and development in the field of renewable energy as well as efforts to reduce greenhouse gas emissions. Second, this income can also be used for programs to mitigate the impact of future carbon emissions and climate change control initiatives. Furthermore, allocating some funds to increase energy efficiency is a concrete step in encouraging an overall reduction in carbon emissions [15].

With a tariff of 5 USD per ton of CO2, Indonesia has the potential to receive taxes from carbon emissions of IDR 3.03 trillion per year [24]. This proves that Indonesia has the potential for large tax revenues from the discourse on implementing a carbon tax. Based on the results of research conducted by [25]. Significant potential for carbon tax revenue of 23.16 trillion in 2024. Funds obtained from the imposition of carbon tax can be allocated to finance blue economy research and development activities. This income can also be allocated to reduce the impact of future carbon emissions and control climate change. Additionally, efforts to reduce carbon emissions can also include using revenues for energy efficiency. The potential for carbon tax revenue in Indonesia has significant prospects to support the development of a blue economy. This can provide a substantial source of funding for a range of sustainable ocean economy initiatives, driving innovation, creating jobs and contributing to the reduction of carbon emissions. However, implementation needs to be done carefully by considering various economic and environmental aspects.

5. Conclusion

The implementation of a carbon tax in Indonesia has significant potential to support the development of a blue economy or sustainable marine economy. Carbon taxes can be an important source of funding for a variety of sustainable marine economy initiatives including marine environmental conservation, marine technology research and development, and blue economy supporting infrastructure. The potential benefits of implementing a carbon tax for the blue economy include encouraging the reduction of carbon emissions, motivating the use of clean and renewable energy, spurring environmentally friendly technological innovation, and creating new jobs in the sustainable marine sector. Funds from the carbon tax can be allocated for blue economy research and development. However, implementing a carbon tax needs to be done carefully by considering various economic and environmental aspect. For future research, recommendations that can be explored include enriching existing data on the potential for carbon tax revenue in Indonesia and its impact on the blue economy, as well as adding a comparison of carbon tax implementation in other countries and how it impacts the blue economy.

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