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Indonesia's Economic Impact of the Carbon Tax

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ABSTRACT

What is the impact of the adoption of the carbon tax on climate change, carbon dioxide emissions, and other impacts on the Indonesian economy? is the research question raised in this paper. This study is crucial because although the Indonesian economy hasn't fully recovered, the government has announced plans to impose additional taxes that will burden businesses and industries and may lead to an increase in unemployment as a result of layoffs. This study was inspired by a number of studies on climate change and carbon dioxide emissions that show that, by 2050, the world will become hotter and more people would die from breathing poor air as a result of rising carbon dioxide emissions. The author tries to determine what effect a carbon price might have on Indonesia's economy. Data on the adoption of carbon taxes in 15 countries that have already done so was gathered by the authors between 1990 and 2019. This study adopted a descriptive qualitative methodology. The implementation of carbon taxes in several countries such as Finland and Sweden has proven successful in reducing carbon emissions and does not have a negative impact on their country's economy.

Keywords: Indonesia’s Economics, Carbon Tax, Climate Change, Carbon Dioxide Emissions

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INTRODUCTION

The carbon tax, which was born through the Harmonized Tax Regulations Act, adds to a series of fiscal policies used as instruments to control climate change. The implementation of the carbon tax is proof to the community and the outside world that the Indonesian government is committed to using various fiscal instruments to finance climate change control as a priority development agenda. The main purpose of imposing a carbon tax is to change the behavior of economic actors to switch to low-carbon green economic activities. This is in line with the Government's efforts to achieve the target of reducing greenhouse gas emissions by 29% with its own capabilities and 41% with international support by 2030. The research problem raised in this study is what is the impact of implementing a carbon tax for companies / industries because taxes for companies are a burden / cost so that it will increase the Cost of Goods Produced (COGS), so that the selling price of the product will increase and become a burden for the public due to the increase in the price of goods/services from the company/industry's products. This research is important to do because the condition of the Indonesian State is still in the covid-19 pandemic period where the economy has

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not recovered 100% but the State issued a new policy by implementing new taxes which can increase the burden on companies / industries and can have an impact on increasing unemployment due to layoffs carried out by the company / industry due to the high burden on companies / industries. Increase in the cost of living (inflation) will have an impact on unemployment. Studies in Australia state that the carbon tax is one of the effective policies to minimise coal and petroleum production in the mining industry (Humphreys, 2007). According to a study by Sam Meng, Mahinda Siriwardana and Judit McNeil in the Environment Resource Economic Journal (2013), a carbon tax will be effective in reducing carbon emissions. In addition, Humpreys (2007) in Exploring a Carbon Tax for Australia states that the carbon tax of A$ 15 per ton will increase government revenue by about A$ 6.5 billion and A$ 30 per ton will generate government revenue of A$ 13 billion. The effect of the carbon tax can be seen in the figure below:

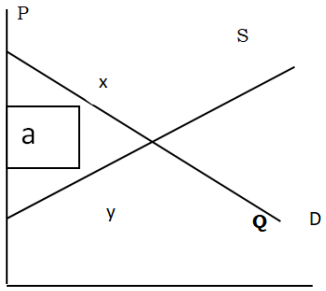

Figure 1. The Effect of a Carbon Tax on Product Prices
P (price), Q (Quantity), S (supply), D (demand), a (tax revenue), b (deadweight loss)
Source: Data Processed (2022)

Based on the chart above, government revenue on carbon taxes is indicated in a square form. The company (manufacturer) will receive at a price of y, and the consumer will have to pay at a price of x. The difference between the two prices is a tax for the government, taxes can push higher prices paid by consumers and lower prices received by producers. Carbon taxes are preferred over carbon trading systems because they are more efficient, effective, simple, flexible, and transparent (Humphreys, 2007).

Literature Review

Global warming associated with EGRK (Greenhouse Gas Effect) and energy constraints are the two main threats to the global economy. The most significant carbon emissions are CO2 emissions, which account for about 72% of EGRK (IPCC, 2007). The Climate Resilience Handbook (2018) reports that 2017 was a record year of natural disasters, including hurricanes, wildfires, heat waves, and droughts, which caused $31 billion in losses globally. The World Health Organization (WHO) (2014) estimates that about seven million people die each year from indoor air pollution. The majority of these deaths occurred in LDCs Least Developing Countries (Collier, 2008). Global warming is one of the main challenges as well as the biggest threat to natural life, prosperity, and security (Mundial, 2018). Carbon dioxide emissions are a major component of greenhouse gases (GHGs), accounting for nearly two-thirds of all GHG emissions. The tenth annual report of the "Carbon Emissions Gap Report 2019" issued by the United Nations Environment Programme (UNEP) shows that in order to achieve the Paris Agreement's goal of limiting temperatures to 1.5 degrees celsius above pre-industrial levels, global carbon emissions need to be reduced by 7.6% annually between 2020 and 2030 (Christiansen et al., 2018). There is an urgent need for the formulation of effective policies to mitigate the growth of carbon emissions. Reducing the use of traditional fossil energy while increasing the use of renewable energy has become an important step for many countries to deal with climate change, such as the European Union and India (Bridge et al., 2013).

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The carbon tax is a tax imposed on the use of fuel containing hydrocarbons (Hoeller & Wallin, 1991). Fuels that contain hydrocarbons or commonly referred to as fossil fuels include coal, petroleum and natural gas. The carbon tax is one of the indirect taxes, which is a tax imposed on transactions. Baranzini and Carattini (2013) mentioned that the carbon tax is a price instrument in relation to climate policy. This is due to the pricing of certain amounts of carbon emissions. In the Carbon Tax Policy Paper (2013), there are three basic options for the imposition of a carbon tax, namely Tax applied directly to measured GHG emissions (Taxes imposed on carbon emissions issued however, the imposition of taxes on emission output is very complex), Fossil fuel input tax on coal, crude oil, and natural gas, based on their carbon content (Taxes are imposed on the inputs of fossil fuels used, depending on the amount of carbon content in them where this alternative requires a chemical reaction manufacturing process) and Tax levied on energy outputs (Taxes are imposed on energy produced such as electricity). Christiansen et al. (2018) define a carbon tax as a levy on the carbon content of fossil fuels, since almost all carbon in fossil fuels is ultimately released as CO_2, a carbon tax equivalent to a CO_2 emission tax.

The imposition of a Carbon Tax will basically give rise to various polemics because it has the potential to reduce economic growth, reduce social welfare and even damage industrial competitiveness. This arises not without reason, the carbon tax will directly affect a number of industrial sectors such as mining, steel/ construction plants, and energy companies. The cost of production becomes higher, the price of electricity and transportation will become more expensive because of this tax. In the end, those affected are the people who are in the last transaction chain. Smith (Baranzini & Carattini, 2013) in his research shows that the imposition of a carbon tax in the UK is more burdensome for the poor than the upper middle class, which in turn leads to widening economic inequality.

Table 1. Development of the International Carbon Tax

Finland carbon tax (1990)	Denmark carbon tax (1992)	Switzerland carbon tax (2008)	France carbon tax (2014)
Poland carbon tax (1990)	Latvia carbon tax (1995)	Iceland carbon tax (2010)	Mexico carbon tax (2014)
Sweden carbon tax (1991)	Slovenia carbon tax (1996)	Ireland carbon tax (2010)	Portugal carbon tax (2015)
Norway carbon tax (1991)	Estonia carbon tax (2000)	Japan carbon tax (2012)	China carbon tax (2017) & Singapore carbon tax (2019)

Source: Data Processed (2022)

METHODS

This study is a literature review. Literature review is a systematic, explicit and reproducible method for identifying, evaluating and synthesizing works of research results and ideas that have been produced by researchers and practitioners. Aims to make an analysis and synthesis of existing knowledge related to the topic to be researched to find empty space for research to be carried out (Tabuena et al., 2021; Cresswell & Cresswell, 2009). This research will examine various carbon tax theories and compare them with the application of carbon taxes in several countries. The data presented is secondary data obtained from the internet and journals to provide analysis regarding the plan to implement a carbon tax in Indonesia.

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RESULTS AND DISCUSSION

Finlandia

Finland was the first country in the world to impose a carbon tax in 1990. Khastar et. al (2020) mentioned that Finland applies a tariff of €1.12 or the equivalent of US$ 1.20 per ton of CO_2 equivalent. This tariff is very different when compared to the tariff applied by Sweden in 1991, which is US$ 26 per ton co_2 equivalent. Despite the significant difference in tariffs, the Finnish Government continues to make changes and policy updates and slowly increase the carbon tax rate there, until by 2021 the carbon tax rate in Finland touches the figure of €62 or equivalent to US$ 73.02 per ton of CO_2 equivalent. Bavbek (2016) mentioned that when it was implemented in 1990, the Finnish carbon tax was imposed not only based on carbon emissions produced from a product, but the basis for the imposition of the tax was based on the carbon emissions produced and the components or amount of energy produced by the fuel, in a ratio of 60:40. This phenomenon shows that initially Finland wanted to try to impose taxes, both on emissions and at the same time on energy, through one mechanism, namely the carbon tax. Nonetheless, these provisions related to the carbon tax in Finland have undergone significant changes in the last 30 years.

Based on a report from the Finnish Ministry of Environment website quoted from Khastar et.al (2020), it is known that the provisions of this carbon tax have undergone significant changes in 1997 and in 2011. In 1997, the Government of Finland amended the provisions related to the carbon tax, namely by increasing the carbon tax rate significantly. Then for the amendments made in 2011, the Finnish Government has officially separated the carbon tax from the energy tax so that now the basis for the imposition of a carbon tax in Finland is 100% based on the carbon emissions produced on the use of these fuels and without considering the amount of energy produced. The Finnish government imposes a carbon tax on fossil fuels that produce carbon emissions, both those used for the transportation sector and for heating purposes. For this reason, every use of fossil fuels for transportation and heating purposes will be subject to a carbon tax according to the level of emissions produced from each fossil fuel. The fuels in question are all fossil fuels for the transportation sector, such as gasoline, and include natural gas and coal. The amount of carbon tax to be imposed is determined by multiplying the amount of emissions produced from fossil fuels by the carbon tax rate in force at the time.

Finland provides exemptions for certain sectors from the imposition of a carbon tax. This was done with the aim of maintaining the stability of the Finnish economy because generally those who were granted this exemption were sectors that were strategic for the Finnish economy. An example of a sector exempted from the carbon tax in Finland is the manufacturing industry sector. Any use of fossil fuels by the manufacturing industry will not be subject to a carbon tax. The goal is to protect strategic industries in Finland so that they can continue to compete in the international market (Bavbek, 2016). In addition to the manufacturing industry, the Government of Finland also excluded the timber industry sector from the imposition of a carbon tax. This is because the wood industry is a comparative advantage for Finland in the international market and at the same time a mainstay sector for Finland in exporting. The existence of these exceptions makes finland's level of coverage of the imposition of a carbon tax only 36% of its total emissions. Despite many exceptions, Finland's carbon tax proved capable of providing quite potential tax revenues. As of 2013, it is known that Finland was able to obtain additional tax revenues of US$ 800 million from the carbon tax (Carl & Fedor, 2016). This happens because considering that the carbon tax rate applied by Finland is still quite high when compared to other countries in the world, although it is still below Sweden's tariff. All of these revenues are allocated to the central government for use in financing state spending. This is because Finland does not set earmarking provisions for these revenues to reduce carbon emissions like Sweden.

With the policies designed, the Finnish Government has proven successful in reducing carbon emissions. Bavbek (2016) mentioned that from 1990 to 1998, Finland has succeeded in reducing

carbon emissions by 7% of the total emissions produced. This success is nothing but the impact of the carbon tax as well as other environmental taxes implemented in Finland. Finland actually has several other levies in place to address environmental issues. Khastar et.al (2020) explained that some of the other levies applied by the Finnish Government to address environmental issues are energy tax, transportation tax, and resources tax. This combination of the carbon tax with other taxes has proven successful in reducing carbon emissions in Finland. This success in reducing emissions did not only occur from 1990 to 1998. Carbon emissions from Finland over the past 30 years have continued to decline (The World Bank, 2018). From 2000 to the end of 2018, Finland's carbon emissions have decreased very significantly by 19.49%. This figure is also not much different from neighboring Sweden, which has experienced a 27% reduction in carbon emissions since its implementation in 1991.

For this reason, the results of the implementation of this carbon tax in Finland can also be classified as excellent results. This is because the carbon tax implemented in Finland has proven successful in reducing emissions and does not have a negative impact on the country's economy. This can be seen from Finland's Gross Domestic Product (GDP) which has continued to grow since the implementation of the carbon tax in 1990 to 2020. Over the past 20 years, from 2000 to 2020, Finland's Gross Domestic Product (GDP) has experienced a growth of 114% (World Bank, 2020a). This GDP growth shows that the Finnish economy is not affected by the implementation of the carbon tax carried out by the Finnish Government. This success comes as a result of other supporting policies built in conjunction with carbon tax policies. In addition to implementing a disincentive carbon tax, Finland also makes many other policies that are incentivized to society. One of the main policies to maintain this economic growth is to reduce the income tax rate. This is the reason why Finland did not make a policy of earmarking carbon tax revenues to reduce emissions but instead included it as a central government revenue because Finland's tax revenues were reduced a lot due to the decrease in this income tax rate so it had to be covered with revenue from the carbon tax.

Swedia

Sweden is the country with the highest carbon tax rate in the world. In 1991, Sweden began to implement a carbon tax at a rate of $26 per ton co_2 equivalent, or equivalent to Rp 364,000 per ton of CO2 equivalent assuming an exchange rate of Rp14,000 (Kossoy et al., 2015). These rates continue to increase over time. Based on data obtained from the Tax Foundation (2021a) it is known that Sweden imposes a carbon tax rate of US $ 137 per ton co_2 equivalent. Compared to all countries in the world that have implemented carbon taxes, Sweden does have the highest rates. As a fellow developed country, Sweden even has a carbon tax rate almost 2 (two) times higher than Finland, which is also a neighboring country, which only sets a carbon tax rate of €62 or the equivalent of US$ 73.02. Regulations related to the implementation of the carbon tax in Sweden have changed many times in the 30 years of its implementation (Jonsson et al., 2020). At the beginning of its implementation in 1991, Sweden set a carbon tax rate of US$ 26 per ton of CO_2 equivalent. This tariff then increased drastically from 2000 to 2004. Where in 2000, the Swedish government raised the carbon tax rate from US$ 26 to US 32 per ton CO_2 equivalent and in 2004 it was again raised to US$ 95 per ton CO_2 equivalent. This tariff increase then continues to be carried out slowly until in 2021 it reaches a figure of US $ 137 per ton CO_2 equivalent.

The carbon tax began to be implemented by the Swedish Government since 1991. The implementation of the carbon tax is carried out in line with the tax reforms carried out by the Swedish Government. Jonsson et.al (2020) explained that in 1991, Sweden carried out a tax reform called grön skatteväxling or "green tax-switch". One of the objectives of this tax reform is to establish a new environmentally-based taxation provision to address environmental problems that have been considered since 1988. One of the results of this tax reform was the emergence of a new tax, namely the carbon tax implemented in Sweden. The Swedish government imposes a carbon tax on fossil fuels used for transportation and heating purposes. These fossil fuels in question include gasoline, coal and diesel oil. Nonetheless, since its implementation in 1991, Sweden has excluded many

sectors from the imposition of a carbon tax. This exception was made as a measure to maintain the condition of the Swedish economy. Some examples of sectors that are excluded from the imposition of a carbon tax are the industrial sector, the mining sector, the agricultural sector, and the forestry sector. However, even though Sweden does not implement a carbon tax on this sector, the Swedish Government still requires these sectors to pay for the emissions produced, namely with the carbon trading scheme or known as the European Union Emission Trading Scheme (EU ETS). The European Union Emission Trading Scheme or EU ETS is a carbon emission trading scheme formed and intended for European countries. Please be aware that the price or rate of carbon in the EU ETS is very small when compared to the carbon tax rate in Sweden. This led the Swedish Government to create strategic sectors such as industry, agriculture, forestry and mining to be subject to EU ETS and not a carbon tax. This is because considering that the EU ETS tariffs are quite low, it will not affect this strategic sector too much and as a result will not have a negative impact on the country's economy. The existence of exceptions for certain sectors makes the carbon tax in Sweden only have coverage of 40% of its total carbon emissions.

In the imposition of this carbon tax, Sweden stipulates 3 (three) tax subjects, namely Importers, distributors, and large consumers (Jonsson et al., 2020). This is because Sweden does not have a producer of fossil fuels in its country so the imposition of a carbon tax is carried out at the level of importers, distributors and consumers in large quantities. For example, in the event that an importer imports gaseous fuel from another country for sale to a Public Refueling Station in Sweden then a carbon tax will be imposed on that importer. Nonetheless, this carbon tax burden paid by importers or distributors will usually be charged or transferred in part or in full to the next chain. Importers or distributors will charge a carbon tax as a component of the cost so that it will make the price of fuel increase. The high rate of carbon tax applied results in a very high carbon tax revenue for Sweden as well. Based on tax revenue data from the OECD (2019), it is known that as of 2019, Sweden managed to collect carbon tax revenues of US$ 2.3 billion or equivalent to 32.7 trillion rupiah. All revenues from this carbon tax will go entirely as central government revenues and without being allocated to certain matters. This is because Sweden does not set specific earmarking rules in the use of this carbon tax revenue (Jonsson et al., 2020). This is different from the implementation of a carbon tax in Canada. The Canadian government made it a policy that the payment of the carbon tax made by the public would be considered an Income Tax credit. In the event that the amount of income tax owed is zero or non-existent, then the previously paid carbon tax can be requested for a return or direstitution (Jonsson et al., 2020).

The carbon tax is actually one of several types of levies on carbon emissions implemented by the Swedish Government. Some other types of levies on fossil fuels in Sweden are energy tax, aviation tax, carbon trading (EU ETS), and vehicle tax (vehicle tax). Some of these other levies had actually existed even before the carbon tax was implemented. For example, the energy tax, this tax has existed since 1924, but since there was a carbon tax, the energy tax rate has been lowered and has been applied until now as a "companion" to the carbon tax in reducing carbon emissions. The large number of these levies shows that Sweden is really serious about dealing with environmental problems, especially issues related to global warming caused by carbon emissions. Sweden is an example of a country that has succeeded in implementing a carbon tax (Jonsson et al., 2020). Sweden was able to design carbon tax provisions that could reduce carbon emissions and not have a bad impact on the Swedish economy. From the beginning of its implementation in 1991 to 2018, Sweden has managed to reduce carbon emissions by 27%, where the biggest decline occurred in early 2000. This significant reduction is believed to have occurred due to a significant increase in the carbon tax rate in Sweden in 2000. Although Sweden is reducing carbon emissions by implementing various levies, especially with the implementation of a carbon tax whose tariffs are relatively very high, the Swedish economy has proven to be unaffected by this policy. Even from 1990 to 2020, Sweden's Gross Domestic Product (GDP) has experienced growth of up to 105% (World Bank, 2020b). This is the reason why the implementation of the carbon tax in Sweden can be said to be successful.

The carbon tax designed by Sweden successfully reduces carbon emissions and does not have a bad impact on the country's economy. This is due to other policies implemented by Sweden to offset the negative impact of the imposition of a carbon tax. When the carbon tax was implemented, namely in 1991 through its tax reforms, the Swedish Government not only imposed a carbon tax but also drastically lowered other existing tax rates (Jonsson et al., 2020). As for the lowered tax rate, this is the income tax rate, both for individuals and for entities. With the tax reform in 1991, the Swedish Government lowered the individual income tax rate from the original 80% to 50% and for agencies it was lowered from the original 57% to 30%. In addition, the Swedish government also abolished several other types of taxes, such as the inheritance tax abolished in 2004, the businessman tax in 2005, and the wealth tax in 2007. The policy of lowering the income tax rate and eliminating several other types of taxes is carried out so that people do not bear too large a tax burden so that the economy can continue to run. This is the reason why the Swedish Government did not create a special earmarking of carbon tax revenues but rather the entire carbon tax revenue was included as central government revenues used to finance central government spending. With the lowering of the income tax rate and the elimination of several types of taxes, Sweden has experienced a decrease in the source of tax revenue as a result of which all revenues from carbon taxes will be used to cover tax revenues, so that the Swedish Government still has sufficient funds in carrying out government functions. By using schemes like this, Sweden has proven successful in reducing carbon emissions through a carbon tax and the implementation of this carbon tax has also not had a bad impact on the Swedish economy.

Swiss
The Swiss government has implemented a carbon tax since 2008. The applied carbon tax rate is US$ 99 per ton of carbon emissions. The tariff is equivalent to Liechtenstein and is the second highest tariff in Europe. Switzerland's carbon tax applies to CO2 emissions mainly from the industrial, electrical, building, and transport sectors (Tax Foundation, 2020; World Bank, 2020).

Polandia
The Polish government has imposed a carbon tax since 1990. Currently, the applicable tariff is US$ 0.10 per ton of carbon emissions and is the lowest in Europe. This tax applies to all fossil fuels and other fuels that produce GHG emissions as well as GHG emissions from all sectors but with exceptions for certain entities.

Kanada
The Canadian government has implemented a carbon tax since 2019 with rates starting at US$.

Meksiko
The Mexican government imposed a carbon tax in 2014. Tariffs are set from US$ 0.4 per ton of CO2 to US$ 3 per ton of CO2. Carbon tax in Mexico applies to CO2 emissions from the power sector, industry, road transport, aviation, shipping, buildings, waste, forestry, and agriculture (World Bank, 2020).

Chili
The Chilean government imposed a carbon tax in 2017. The tarif set is US$ 5 per ton of carbon emissions. Chile's carbon tax applies to CO2 emissions mainly from the power and industrial sectors and covers all types of fossil fuels (World Bank, 2020).

AfrikaSelatan
The South African government imposed a carbon tax in 2019. The tariff is set at US$ 9 per ton of carbon emissions. South Africa's carbon tax applies to GHG emissions from the industrial, electricity, building and transport sectors. Its imposition is independent of the fossil fuels used (World Bank, 2020).

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Singapura
Singapore became the first country in Southeast Asia to impose a carbon tax. The carbon tax is effective as of January 1, 2019. Tariffs are set at US$ 4 per ton of carbon emissions. Singapore's carbon tax applies to GHG emissions from industry and the power sector with exceptions for certain sectors (World Bank, 2020).

Jepang
The Japanese government has implemented a carbon tax since 2012. Tariffs are set at US$ 3 per ton of carbon emissions. This tax applies to CO2 emissions from all sectors with some exceptions for the industrial, electricity, agriculture, and transportation sectors, including all types of fossil fuels (World Bank, 2020).

Carbon Tax Implementation Plan in Indonesia
Through the enactment of Law Number 7 of 2021 concerning harmonization of tax regulations (UU HPP), the Government of Indonesia will begin to impose a carbon tax. At the beginning of its implementation, Indonesia will start imposing a carbon tax on the Coal-Fired Power Plant (PLTU) sector first. This sector is used as an experimental sector to then see the influence that occurs on the taxation of carbon emissions to be expanded to other sectors in 2025. The expansion of the imposition of a carbon tax to other sectors will be carried out by considering the readiness of each sector and considering indonesia's economic conditions in that year. Article 13 paragraph 1 of the HPP Law states that a carbon tax will be imposed on carbon emissions that have a negative impact on the environment. Related to that, the explanation of the HPP Law states that what is meant by carbon emissions is carbon dioxide compounds (CO_2), dinitro oxide (N_2O), and methane (CH_4). The three gases that are the main cause of this global warming, will then be referred to as carbon dioxide equivalent (CO_2e).

Furthermore, Article 13 paragraph 5 of the HPP Law explains that the carbon tax will be imposed on individuals or entities that buy goods containing carbon and/or carry out activities that produce carbon emissions. So, if described, there will be 2 (two) objects that will be subject to carbon tax, namely "purchase of goods containing carbon" and "activities that produce carbon emissions". The explanation of the HPP Law states that what is meant by "goods containing carbon" is fossil fuels and also includes other goods that can produce carbon emissions. The explanation of the HPP Law also states that the "purchase" activities referred to in paragraph 5 include domestic purchases and import purchases. In addition, the explanation of the HPP Law also states that what is meant as "activity that produces carbon emissions" is any activity that will produce / emit carbon emissions such as the activities of the energy sector, the agricultural sector, the forestry sector and land change, the industrial sector and waste. For this reason, if there are individuals or entities who buy fossil fuels to be used for their purposes, they will be subject to a carbon tax. Article 13 paragraph 7 of the HPP Law states that for the purchase of goods containing carbon, a carbon tax will be owed at the "time of purchase". In addition, in the event that there are individuals or entities carrying out industrial activities, activities that produce goods using machines for which these activities produce carbon emissions, will also be subject to a carbon tax. Article 13 paragraph 7 of the HPP Law states that activities that produce carbon emissions will be owed a carbon tax at the "end of the calendar year" or at "other times" regulated by a Government Regulation.

Thus, it can be concluded that the Carbon Tax Imposition Basis (DPP) is the amount of carbon emissions produced from goods containing carbon and/or from certain activities that produce carbon emissions. For this reason, the estimated amount of emissions produced from these goods or activities will be measured and determined by other Ministries that have the authority and competence in determining the amount of emissions produced from these goods and activities. Article 13 paragraph 10 of the HPP Law states that the DPP of this carbon tax will be determined by a Regulation of the Minister of Finance (PMK) after consultation with the House of Representatives (DPR). Then, the amount of carbon tax owed will be calculated by multiplying

between the Tax Imposition Basis (DPP) and the carbon tax rate. Article 13 paragraph 8 of the HPP Law states that the carbon tax rate applicable in Indonesia is "the same as the price of carbon in the carbon market". So it can be known that the implementation of the carbon tax in Indonesia will be carried out in conjunction with the implementation of the carbon market where the applicable carbon tax rate is the same as the price of carbon in the carbon market. Thus, the carbon tax rate will continue to fluctuate because it follows the movement of carbon prices in the carbon market. For this reason, Article 13 paragraph 10 of the HPP Law also states that provisions related to the determination of this carbon tax rate will be determined by the Minister of Finance through a Regulation of the Minister of Finance. However, Article 13 paragraph 9 of the HPP Law still provides the lowest limit on this carbon tax rate. In the event that the price of carbon in the carbon market is less than RP 30,000 per ton of CO_2 equivalent or IDR 30 per kilogram of CO_2 equivalent, then the carbon tax rate will be set at IDR 30 per kilogram of CO_2 equivalent. The presence of provisions in this paragraph provides certainty that the carbon tax rate in Indonesia will not be lower than IDR 30 per kilogram of CO_2 equivalent. In addition, the HPP Law in Article 13 paragraph 10 also provides room for the Minister of Finance to change this lowest limit in the event that it is necessary. The paragraph authorizes the Minister of Finance to change the lower limit either raising or lowering with the issuance of a Minister of Finance Regulation (PMK) after consultation with the House of Representatives (DPR).

The scheme for implementing a carbon tax in Indonesia is referred to as Cap and Tax. This scheme combines a trading system (Cap and Trade) and a taxation system on carbon (Carbon Tax). So, the Government through the Ministry, which has the authority and competence, will determine and provide a maximum limit on the amount of carbon emissions allowed for each company. This maximum limit is the right for such companies to produce emissions up to that amount. This maximum limit will then be referred to as Cap. In the event that the company manages to change its behavior to be more environmentally friendly so that the total carbon emissions produced are still below the given stamp, then the difference is an asset for the company. This difference is what became known in Indonesia as the Emission Permit Certificate (SIE). On the other hand, in the event that there is a company that is unable or unwilling to change its behavior to be more environmentally friendly so that the total carbon emissions produced exceed the given stamp, then the company will be subject to a penalty or pay according to the difference in more emissions it produces. The penalty or fee that must be paid by the company is what is called a carbon tax. The amount of carbon tax that must be paid will be calculated by multiplying the difference over emissions with the applicable carbon tax rate. However, the amount of carbon tax that these companies have to pay can be reduced in the event that the company participates in carbon trading in the carbon market. The reduction in the amount of carbon tax owed is regulated in Article 13 paragraph 13 of the HPP Law, where this paragraph states that every taxpayer who participates in trading carbon emissions in the carbon market can be given a carbon tax reduction. This means that in the event that a company that produces emissions exceeding the stamp succeeds in purchasing a credit or Emission Permit (SIE) from another company that produces emissions under the stamp, then this Emission Permit (SIE) will be used as a deduction from the carbon tax. The amount of this reduction in carbon tax will be adjusted to the amount of SIE successfully purchased by the company. If a company that produces emissions exceeding the cap does not succeed in purchasing SIE or successfully purchases SIE but does not cover the entire difference in the resulting emissions, then the company will still be subject to carbon tax. This is because the size of the SIE has not succeeded in reducing the entire carbon tax burden that the company should have paid.

With this Cap-and-Tax scheme, all parties that produce emissions will still be subject to levies on the emissions they produce. This is because in the event that there is no SIE that can be purchased in the carbon market, it will still be subject to a levy, namely a carbon tax. For this reason, it should be noted again that the carbon tax rate is the same as the price of carbon in the carbon market so that there will be no difference in the costs incurred either by buying an SIE or by paying a carbon tax unless the price of carbon in the carbon market is less than RP 30 per kilogram of CO_2 equivalent.The

proceeds from this carbon tax will go to the state treasury in addition to tax revenues called carbon tax revenues. Article 13 paragraph 12 of the HPP Law states that carbon tax revenues "can" be allocated for climate change control. This provision seems to provide room for the government to use the revenue to reduce emissions but it is not a necessity. The BFK presentation on December 2, 2021 also stated that this carbon tax revenue can be used to increase development funds, climate adaptation and mitigation, environmentally friendly investments and to provide support to low-income communities in the form of social assistance.

There are several justifications for why a carbon tax is likely to be implemented in Indonesia.

1. The carbon tax can be an instrument to protect the environment while being revenue-oriented. The OECD in its publication entitled Taxing Energy Use for Sustainables Development (2021) suggested the imposition of a carbon tax as a climate mitigation solution as well as a new source of revenue after the Covid-19 pandemic.
2. The carbon tax is a form of pigouvian tax that seeks to correct economic activity with negative externalities. The scheme of internalizing the cost of negative externalities is implemented in the presence of taxes that must be borne by actors who produce carbon emissions. Its nature that reduces such negative externalities is in line with the principles of sustainable development.
3. Relevant to the condition of Indonesia. Currently, Indonesia is one of the 20 largest carbon emitting countries in the world (BP Statistical Review of World Energy, 2019). China occupies the highest position with 29%, followed by the United States 15%, India 7%, Russia 4%, Japan 3%, and Indonesia 2%. In fact, Indonesia is in the 5 largest carbon emitting countries in the Asia Pacific Region.
4. The imposition of a carbon tax is actually pro-welfare of the poor. According to the UN World Social Report 2020, climate change will provide greater vulnerability and negative impacts for the poor.
5. The implementation of the carbon tax is in line with international trends. According to World Bank data (2020), carbon taxes have been implemented in at least 25 countries around the world, including various countries in the European Union, Canada, Singapore, Japan, Ukraine, and Argentina.

The implementation of a carbon tax has succeeded in reducing carbon emissions. For example, Sweden has managed to reduce its carbon emission levels by 27%. Therefore, Indonesia can follow the example of countries that have succeeded in implementing carbon taxes. In addition to this justification, it is also necessary to understand the advantages and disadvantages of the carbon tax.

The advantages of implementing a carbon tax:

1. A carbon tax can be widely applied to all types of fossil fuels so that it covers all major sources of emissions.
2. The carbon tax can be applied at a clear rate. Several studies have shown that with clear carbon price information, consumers and the business sector tend to be more encouraged to take energy-saving actions and invest more in energy-efficient technologies (Matsukawa, 2004).
3. Simplicity of administration. The carbon tax collection mechanism can be created the same as the existing tax collection mechanism, so as to minimize administrative difficulties at the time of its implementation.

Meanwhile, there are several disadvantages of implementing a carbon tax (Heyman, 2019):

1. Although carbon taxes set the price for carbon emissions, they generally do not set a highest limit on the emissions that can be produced. Thus, as long as the polluting party is willing to pay, emissions can continue to increase.
2. Political challenges. There are still difficulties in introducing a carbon tax to the community, considering that the carbon tax has an impact on social issues and economic competition.

The OECD (2021) in the Enviromental Taxation a Guide for Policy Makers provides several important points that decision makers need to pay attention to in designing environmental taxation, including the carbon tax.

1. The basis for the imposition of environmental taxes should be aimed at pollutants or polluter behavior (polluter pays principle).
2. The scope of environmental taxes should ideally be aligned with the scale of the scope of environmental damage.
3. The tax rate should be commensurate with the damage to the environment.
4. The system must be precise and predictable so as to motivate the improvement of the environment.
5. Revenue from environmental taxes can help fiscal consolidation or help reduce dependence from other tax posts.
6. The distributional impact on welfare and fiscal burdens must be overcome by other policy instruments.

In addition, in making a carbon tax design, there are things that need to be considered, including the tax basis, tax rate, income distribution, impact on consumers, and efforts to ensure emission reductions (Rusdianti et al., 2022). Basically, in designing a carbon tax policy, the Indonesian government does not need to be hasty, especially related to determining the amount of tariffs. In the short term, the government can map in advance the sectors or activities that cause pollution appropriately so that this policy can be right on target. Generally, the application of carbon taxes is applied to fossil fuels, sectors with large carbon emissions, and so on. Next, determine the voting scheme. Whether this carbon tax will refer to existing levies, such as excise, income tax, and VAT, or is it a completely new tax levy. Other countries generally use excise instruments and fuel tax. Next, determine the carbon tax base (the basis for the imposition of taxes), whether it refers to carbon emissions, fuel consumption, or others. Finally, just determine the right and effective tariff amount. To guarantee its implementation, it is necessary to consider the presence of support in the form of ease of administration, clarity of regulations, and effective socialization. In addition, later the government can also provide rewards for the industry when it succeeds in creating efficiencies in the use of fossil fuels. One thing is for sure, the plan to implement a carbon tax is a policy step that needs to be supported.

CONCLUSION

The implementation of carbon taxes in several countries such as Finland and Sweden has proven successful in reducing carbon emissions and does not have a negative impact on their country's economy. This happens because the country makes very appropriate policies regarding the implementation of carbon tax, including that the carbon tax is not applied to strategic sectors such as the manufacturing industry. The implementation of a carbon tax is imposed on the transportation sector so that people prefer to use public transportation instead of private vehicles (vehicles produce carbon emissions due to the use of fossil fuels) and the imposition of very high tax rates in Sweden is the reason why Swedish people have begun to switch to using public transportation. Another policy implemented by Finland and Sweden is the policy of reducing the income tax rate so that when the income tax rate is lowered, people's purchasing power will increase and affect other tax revenues such as VAT. When the carbon tax is implemented in Finland and Sweden, the Government does not make an earmarking policy of the carbon tax revenue, but the carbon tax revenue is used to finance central government spending (cross-subsidies) which may be reduced due to the emergence of a new tax, namely the carbon tax. The Indonesian state may be able to adopt the policies of other countries that have already implemented carbon taxes such as Finland and Sweden where the country does not apply carbon taxes to strategic sectors such as the manufacturing industry and so on so as not to have a negative impact on the Indonesian economy, but the carbon tax is applied to the transportation sector

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