JURNAL ECONOMINA **e-ISSN: 2963-1181**
Volume 1, Nomor 4, Desember 2022
Homepage: ejournal.45mataram.ac.id/index.php/economina

ANALYSIS THE EFFECTIVENESS OF IMPLEMENTATION CARBON TAX IN INDONESIA

I Gusti Putu Eka Rustiana Dewi[1], Ni Made Sintya Surya Dewi[2]
[1,2]Universitas Mahasaraswati Denpasar

Corresponding Author: [1]rustiana_dewi@unmas.ac.id, [2]sintyasuryadewi@unmas.ac.id

Article History
Received: 15-11-2022
Revised: 25-11-2022
Accepted: 06-12-2022

Keywords:
Carbon Tax; The Climate Change; Greenhouse Gas Emissions

ABSTRACK:
The Indonesian government made a commitment to combating climate change through the introduction of a carbon tax, which the law controlled in harmonizing tax rules UU HPP No.7 Year 2021 in order to reduce greenhouse gases and reach net zero emission in Year 2060. Indonesia delayed the introduction of the carbon tax on April and July 2022, but it still intends to do so in stages in accordance with the road map, the growth of the carbon market, the NDC target, and stable economic conditions. This research aims to describe the effectiveness of implementation carbon tax in Indonesia. Technique analysis data use literature review with descriptive qualitative data analysis and comparative research methodology. The research found that it is crucial to guarantee that carbon price regulation is in place as a management tool to alter behavior and promote innovation and changes in how businesses are managed, particularly those that produce significant amounts of carbon emissions. Due to a lack of alternatives using renewable technology and efficient carbon pricing policies, businesses would be reluctant to change and invest in sustainable business models. Indonesia's carbon tax rate also raises many questions about its effectiveness for changing behavior toward low emission development.

INTRODUCTION

The climate change has been become one of greatest challenges we currently face in the world and has already affected our globe. Climate changes define as long-term change in temperature and weather pattern, natural occurrences such as fluctuations in the solar cycle might cause these shifts. However, since the 1800s, human activity has been a significant contributor to climate change. The global mean sea level is rising, temperatures are rising, wildfires and droughts are occurring more frequently, rainfall patterns are shifting, and glaciers and snow are melting. In the past 20 years, all nations have been impacted by climate change. However, Southeast Asia, including Indonesia, has faced a double challenge: in addition to adapting to the climate change that has been largely caused by greenhouse gases released over decades by advanced economies, Southeast Asia also needs to change its

development strategies that are increasingly contributing to global warming since the area's increasing reliance on coal and oil.

Our emissions of greenhouse gases continue to rise despite growing public awareness of climate change. Earth is presently 1.1°C warmer than it was in the late 1800s as a result. The most recent ten years (2011 to 2020) were the hottest ever. Many people believe that rising temperatures are the main effect of climate change. However, climate change is just getting started. Changes of one area in Earth can have an impact on changes in every other area since our Earth is a system in which everything is interconnected. Severe droughts, water scarcity, wildfires, increasing sea levels, flooding, melting polar ice caps, strong storms, and a reduction in biodiversity are all repercussions of contemporary climate change. In other words, climate change can have an impact on all aspects of human life, including health, housing, safety, work, and the ability to generate food. Some of community, for an example a citizens of small island states and other impoverished countries, are already more vulnerable to climate change. Long-term droughts put people at danger of starvation, and conditions such as rising sea levels and saltwater intrusion have become so severe that entire towns have been forced to evacuate, implying that the number of climate refugees will increase in the future.

Emissions that contribute to climate change are produced all throughout the world. Everyone must take action to prevent climate change, but those who contribute the most to the problem and those nations have a greater responsibility to do so first. Indonesia is geographically one of the most vulnerable nations to the effects of climate change, therefore Indonesia is fiercely devoted to combating climate change by pursuing the goal of achieving zero carbon emissions by 2060 or earlier through carbon tax policy where the law already regulated in harmonization tax regulation UU HPP no 7 Year 2021. The Carbon tax as one of solutions to tackle global climate change has long been discussed at The Paris Agreement in International level. Indonesia finally decided to use carbon tax policy as an effort to restrain main source emission carbon and encourage widespread implementation of renewable energy.

Ten nations worldwide are responsible for more than half of world's greenhouse gas emissions, according to the World Research Institute (WRI). Up until the beginning of 2018, China was the main source of greenhouse gas emissions, according to Climate Watch statistics made available by WRI Indonesia. 12,399.6 million tons of carbon dioxide equivalent are produced in China (MtCO2e). That quantity is equal to 26.1% of all emissions in the world. With a contribution of 6,018.1 MtCO2e, or 12.7% of world emissions, the United States came in second. Then, the European Union made 3,572.6 MtCO2e, or 7.52 percent of the world's emissions. The ten nations with the highest global emissions of greenhouse gases also include Indonesia. There were 965.3 tons of greenhouse gases created in the nation. The energy industry is responsible for the majority of Indonesia's greenhouse gas emissions. Below are the countries with largest contributor of greenhouse gas emissions.

No	Countries	Value MtCO2e
1	China	12.399,6
2	United States	6.018,2
3	European Union	3.572,6
4	India	3.366,1
5	Russia	2.545,1
6	Japan	1.186,6
7	Brazil	1.042,5
8	Indonesia	965,3
9	Iran	827,9
10	Canada	722,8

(Table 1. The Largest Contributor of Greenhouse Gas Emissions)

The Indonesian government intends to implement a carbon price through a pilot program targeted at coal-fired power stations in 2022, but it is yet unknown how much it will reduce Indonesia's greenhouse gas emissions. It intends to implement a cap and tax system for carbon emissions, under which businesses must pay taxes if their emissions exceed the cap established by the government. The Indonesian government intends to implement a carbon price through a pilot program targeted at coal-fired power stations in 2022, but it is yet unknown how much it will reduce Indonesia's greenhouse gas emissions. It intends to implement a cap and tax system for carbon emissions, under which businesses must pay taxes if their emissions exceed the cap established by the government. The government has decided to impose a fee of 30 Indonesian Rupiah per kilogram of CO2 equivalent (CO2e), or $2.10 per a ton of CO2e, which is a relatively low tax rate compared to the rates that suggested by World Bank and International Monetary Fund (IMF) for developing countries' carbon taxes, which range between $30 and $100 per ton of CO2e.

The carbon tax intends to encourage industrial innovation and the shift to low-emission technologies; but, if the price of emissions is too low, businesses will only perceive it as a slight increase in production costs, not a sufficient incentive to invest and change to a sustainable business model. In order to generate incentives to cut emissions, the installation of a carbon price must be accompanied by enough renewable alternative energy and low emission technology. Due to fact that electricity costs account for up to 80% of production expenses, the government has capability to change some of policies that affect the ease of doing business for the renewable energy sector.

The fossil fuel subsidy, which maintains the affordability of electricity, is still disproportionately large compared to the carbon tax, so if this trend continues, renewable energy will continue to be less competitive than coal. The carbon tax will not have a significant impact if subsidies for fossil fuel energy, such as coal, are not phased out or shifted toward renewable energy. More than 20 countries have included carbon taxes in their climate change strategies, but even though Indonesia has one of the lowest carbon prices in the world and has implemented a remarkable carbon tax initiative to combat climate change, it may not be enough to effectively incentivize the market to operate sustainably.

The implementation of a carbon tax policy recently in Indonesia invites many questions from other parties, considered burdensome given the unstable economic conditions after the COVID-19 pandemic. Many parties argue that not only entrepreneurs will be burdened because of this additional expenditure but in the end, it will also affect all levels of society. The implementation of the carbon price in Indonesia in the future has raised concerns about whether it would effectively combat climate change and, ideally, be consistent with its primary goal of protecting the environment due to the unknown timing of its implementation and the imprecise road map.

LITERATURE REVIEW

A carbon tax is a tool for internalizing environmental costs. It is an excise tax on the production of raw fossil fuels depending on those fuels' relative carbon contents (Glossary of Environment Statistics,1997). According to the Carbon Tax Centre (CTC), a carbon tax is a charge levied on the use of carbon-based fuels like coal, oil, and gas. The usage of fossil fuels, whose burning is harming and destabilizing our climate, must be reduced and finally eliminated. A carbon tax is one way to make consumers of fossil fuels responsible for the climate change brought on by the release of carbon dioxide into the atmosphere. If the price is set high enough, it can act as a significant financial disincentive to encourage the economy as a whole to transition to clean energy.

Since quantities of carbon dioxide already in the atmosphere and those being added everyday are upsetting long-established climatic patterns and harming the ecosystems that

support all human settlements and other living things, it is urgent that a carbon price be implemented. The literature indicates that carbon taxes often have a regressive effect in wealthy nations while being neutral or progressive in developing nations. The political agenda for carbon prices is thought to revolve around these distributional implications (Baranzini et al., 2000). Typically, carbon taxes attempt to eliminate tax distortion and enhance the environment, although how much of an improvement depends on the economy's structure and recycling tactics (Orlov,2012).

Carbon taxes are a type of Pigouvian tax that are intended more to alter behavior than to increase money. According to Pigou (1920), there should be a tax imposed that is equal to the marginal social harm produced in order to internalize the external cost of producer activity into his own cost. The goal is to attempt to manipulate the cost of a commodity or service in order to collect all the unfavorable externalities it imposes. The unavoidable consequences of an individual's or an organization's conduct are known as negative externalities. According to Cheung (1978), externalities and social costs are challenges that occur when one person or firm's economic activities in consuming or production have an impact on another person or company.

Different proposals have been suggested and implemented in an effort to address the topic of how negative externalities might be minimized or mitigated, such as emissions taxation or a cap-and-trade system with marketable pollution permits. These techniques attempted to address the detrimental consequences of pollution from several angles. While cap and trade procedures are viewed as an alternative instrument to control pollution, taxes are charged on all emissions emitted. This method sets a cap or limit on the amount of carbon emissions a polluting agent can emit in a year; this limit is gradually reduced over time to reduce pollution.

RESEARCH METHOD

The research method is literature review research, using descriptive qualitative data technic analysis and comparative research methodology to find the limitations of carbon tax policy. The data used in the study is secondary data obtained through some journals such as national and international, books references, internet sites references, news in national references and international media references as well as various state reports which related to potential revenue and challenges on carbon tax implementation. The comparative research methodology using comparison data from Asian nations that have already imposed carbon taxes before Indonesia.

DISCUSSION

Carbon taxes have been implemented over the years in both developed and emerging economies that have different system for enacting carbon taxes which are increasingly being used by nations not only to try to mitigate the implication of climate change but also to avoid sanctions from the international community. Starting from Finland which has implemented carbon price since 1990, followed by other countries Sweden, Norway and Denmark in year 1991 and 1992, India in 2010, Japan and Australia in 2012, England in 2013, China in 2017, South Africa and Singapore in 2019.

Country	Implemented Year
Finland	1990
Sweden	1991
Norway	1991
Denmark	1992
India	2010
Japan	2012
Australia	2012
England	2013
China	2017
South Africa	2019
Singapore	2019

(Table 2. Implementation of a carbon tax in a number of countries)

The Nationally Determined Contribution (NDC) objective, market development, sector readiness, and economic conditions will all be taken into account as the carbon price is implemented in Indonesia in stages in accordance with the roadmap. In addition, the finance minister stated that the government required a tool to carry out this commitment through carbon trading. The conduction of carbon economic values for meeting NDC target, as well as controlling greenhouse gas emissions is governed by Presidential Regulation Number 98 of 2021. The policy governs the use of carbon trading and charges for carbon emissions depending on effectiveness in lowering emissions.

The carbon tax introduces cap and trade on certain sectors such as coal sector which they can emit a certain level of CO2. Cap and trade scheme means that entities whom emit more than the cap are required to purchase an Emissions Clearance Certificate from the entities that are emitting under the cap or purchase an Emission Reduction Certificate. Indonesian Finance Minister Sri Mulyani said that carbon price rate was planned set to be higher or at least same as the carbon price in the carbon market which has minimum rate of IDR 30.- per kilogram of carbon dioxide equivalent, even in Canada, where the price of carbon is expected to rise to almost USD 125 by 2030, the price of carbon is already above USD 40 on the global market. Indonesia must defend the carbon market to prevent it from being utilized by industrialized nations who emit carbon emissions, according to the Minister of Finance, who noted that the price of carbon is comparatively non-uniform globally. The government concerned that Indonesia has to meet its carbon reduction quota before sell it, moreover if carbon price in Indonesia cheap, the other countries with high carbon price will consider to buy the carbon in Indonesia.

Coal, diesel, and gasoline are examples of fossil fuels that could be subject to Indonesia's carbon tax, along with the pulp and paper sector of emission, cement industries, power generation, also petrochemicals. According to Indonesia's law on the harmonization of tax laws, anybody or any entity that consumes carbon dioxide-containing products or emits carbon emissions is subject to a carbon tax. The community and industry in Indonesia will need to support the derivative policies that Indonesian government will support the implementation of a carbon price so that there is no double taxation that could burden the community and no overlap between the carbon tax and other taxes when it is implemented. The basic cost of producing could go up for state power providers as a result of this carbon tax, which would eventually affect the selling price of electricity, if Indonesia government does not develop effective carbon tax structure, the tax that should be paid by the corporation will also be paid by the final consumer, which this system similar to the VAT.

The Indonesian Government set the carbon tax rate too low in comparison to the rate advised by the World Bank and the International Monetary Fund, the suggested rate is calculated using the formula marginal benefit of abatement = marginal cost of abatement based on Indonesian conditions. According to that equation, IDR 300,000 per tonne CO2e is the appropriate price for Indonesia to implement so as meet the objective reduction emission that established by NDC. It is appropriate for the government to establish a carbon tax policy along with supporting policies in order to reduce the economic distortion brought on by the tax. It can be put into practice by offering incentives to encourage sources of renewable energy development. Through government supporting policies, this will make producers have other option to create product by using friendly environmentally energy with using less carbon thus the price of goods and services that they sell does not significantly increase either reduce consumption of publics.

Concerned to tax rate, carbon tax in Indonesia has lower rate compare to carbon rates in various countries in the world. European Union and North American countries were among the most ambitious by imposing high carbon prices, where the carbon price is still below the range of USD 40-80 per tCO2 then only 3,76 percent of global emissions have a price equal to or more than USD 40-80 per tCO2. Currently from the records price range for carbon tax is under USD 1 to USD 137 per tCO2ein European Union, Sweden's highest carbon price was set at USD 137 per ton then Switzerland USD 101 per ton. Then in China carbon price depends on the city is USD 4 per ton in Beijing and USD 6 per ton in Shanghai. Singapore sets carbon price of USD 4 per ton CO2.

Since Indonesia actually produced more emissions than Singapore did while being the first country to introduce a carbon tax in South East Asia, the issue of the lower tax rate established by the Indonesian government in comparison to Singapore has come into question. Despite being a sophisticated system, the carbon tax rate of IDR 30 per kilogram CO2e is excessively low. The economist Nurul Aidha stated that the appropriate price for Indonesia is between IDR 75 and IDR 100 per kilogram of CO2e. She is also cited in Article 13 Paragraph 5 of HPP Law, which states that only individuals or entities that purchase items containing CO2 or emitting carbon dioxide are liable to the carbon tax, which indicates that consumers are the only ones who are affected if a coal firm sells coal.

Implementing a carbon price can lower national emissions, but it will also increase economic costs, which could lead to a decline in GDP, in both scenario the carbon price will become progressive for recycling revenue in terms of distribution income. However, the carbon price will become regressive in the absence of a compensating mechanism because the weight of the tax falls disproportionately on the poorer households (Herbert Hasudungan,2017). Apart from their success in lowering the country's GHG emissions, Hasudungan's research findings also showed that different carbon taxing scenarios will have different effects on the economy's performance in terms of magnitude changes. When fossil fuels are subject to a carbon tax, the cost of those fuels to consumers rises right away. These adjustments would consequently result in a downturn of the economy.

Recently in economically, Indonesia already had to deal with rising price of fuel, cooking oil, and soybean as well as the rate of a value added tax that increased by one percentage point from 10% to 11% on April 2022, this condition has create welcomed the Indonesian government's decision to postpone the implementation of the carbon tax on April and July 2022. Government officials decided against enacting a carbon tax, according to Sri Mulyani, Minister of Finance, because they needed more time to ensure that it was consistent with or compatible with existing laws and the goals of nation to achieve zero emissions by year 2060. They also needed to synchronize the roadmap and ensure that the implementation went smoothly. The decision to postpone the introduction of carbon price also occurred since the cost of basic commodities and energy increased. The rate of inflation surged in March to

2,64 percent, that become highest level in last two years. As comparison, the following are countries in Asia such as India, China, Japan and Singapore which already implemented carbon tax in their country.

India is one of the ten nations most impacted by climate change-related extreme weather and it is crucial to reduce carbon emissions as much as possible. India currently lacks a national carbon tax and does not have uniform system of carbon taxation, although several state governments have instituted their own levies to recover the costs of harmful externalities, such as the Green Cess in Goa and the Eco Tax on automobiles entering Mussoorie. The Clean Energy Cess was one policy that the Indian government implemented in 2010. Its goal was to encourage the use of clean fuels by making coal more expensive and allocating a percentage of the money raised to finance clean energy initiatives and research. However, the Clean Energy Cess was eliminated in 2017 with the implementation of the Goods and Services Tax (GST), and a Compensation Cess on coal production at a rate of Rs. 400 per tonne was substituted in its stead. The newly implemented Compensation Cess will be in effect until 2022. However, it simply taxes the use of coal, not the amount of carbon emissions that coal use produces. This leads to two problems which are It does not diminish the amount of coal consumed and the subsequent amount of carbon dioxide released, also taxpayers are penalized even if they choose to use cleaner coal alternatives. At the moment, India's carbon taxing scheme is at best crude. Furthermore, the taxation structure is not progressive. This not only has an effect on the economy of the nation since the external costs of carbon are not sufficiently captured, but it also may have an influence on India's international trade.

Japan expects to reduce its carbon emissions by 26% with a tax rate of JPY2.89/t-Co2 ($2.65) by year 2030. However, this objective fall well short of the 76% decrease in carbon emissions by 2030 that is suggested by environmental scientists (UNFCCC, 2019). Climate change is a major threat to Japan because of its location in the Pacific. The climate policy of Japan have certain significant weaknesses. They haven't addressed the pressing climate catastrophe or significantly altered domestic carbon reduction efforts. Due to inadequate carbon rates in the industrial and electricity sectors, the carbon tax itself has come under fire as being excessively low. Among OECD and G20 nations, Japan has one of the lowest carbon tax rates. The tax rate was meant to rise every year, but since 2016, these increases have been stagnant. Japan expected to concentrate on potential sources of income, along with discussions on reforming subsidy assistance and the revenue treatment of the carbon price, these revenue improvements could be taken into consideration. Moreover, Japan also expected to Increase the price of the carbon tax since the present tax rate has received a lot of flak for being excessively low. Therefore, a gradual rise should be implemented to guarantee that businesses can modify their business plans to a future low-carbon. Recently Japan suggested a financial incentive to decarbonize shipping in May 2022, by year 2025 the maritime industry would be required to pay $56 per tonne of CO2 under the proposed global carbon tax. The tax, if implemented, is expected to bring in more than $50 billion annually.

China's VAT reform strategy, which saw the VAT rate for manufacturing reduced from 16% to 13%, was instituted in 2019 after the carbon tax was implemented there. As a result, there will be a significant increase in carbon emissions and an increase in manufacturing output. Will a carbon tax be a useful instrument in the fight against the harmful effects of the VAT reform on carbon emissions? A multi-regional dynamic-recursive equilibrium general model was developed in China to assess this possibility and look into any potential environmental, energy, and economic effects of these reforms. A carbon tax, a program to reform VAT, and three separate policies are among the scenarios provided. The findings indicate that while China's VAT reform is a good fiscal policy strategy that can

promote macroeconomic growth over the long term, it has a negative impact on macroeconomic growth.

Through the Carbon Pricing Act (CPA), which sets the carbon price at S$5 per tonne of greenhouse gas emissions, Singapore is the first nation in Southeast Asia to enact a carbon tax in 2019. (tCO2). The carbon price will promote the shift to a low carbon economy by encouraging emissions reduction across all sectors. To ensure an honest, fair, and constant price signal across the economy, there are no exceptions for covered establishments. Singapore's carbon price will gradually be raised to S$50 to S$80 per tonne of emissions by 2030, according to Finance Minister Lawrence Wong, in order to help the city-state, achieve its new goal of reaching net zero emissions by the middle of the century. He noted that green technologies have advanced rapidly and that there are now alternative low-carbon.

SINGAPORE CARBON TAX PRICE INCREASE

Currently	S$ 5 per ton
2024 and 2025	S$ 25 per ton
2026 and 2027	S$ 45 per ton
2030	S$50 to S$ 80 per ton

(Table 3. Singapore Budget 2022 progressively raise carbon tax)

Singapore has established a carbon tax from 2019, providing businesses with a price signal across the board to push them to reduce emissions while also allowing them to act where it is most profitable. Singapore has implemented a comprehensive set of mitigation measures, including a carbon price, to lower emissions, promote green economic possibilities, and make the transition to a low-carbon, energy-efficient economy. The carbon tax is imposed evenly across all industries, with a focus on energy-intensive and trade-exposed companies, in order to establish a clear, equitable, and consistent pricing signal throughout the economy. For the first time, from 2019 to 2023, the carbon tax level is set at S$5/tCO2e in order to create a transitional period and give emitters time to adapt. Increasing carbon price is not anticipated to bring in more money for the Singaporean government in this decade. The money will be used to lessen the impact on people and companies while assisting in the transition to a green economy and decarbonization activities.

If Indonesia Government can consider case studies where carbon price is used to establish a renewable energy ecosystem within the right timescale, it may be possible to improve the design of the carbon tax by taking into account the experiences of other nations. To encourage emissions reduction, a carbon price must be implemented along with enough renewable energy options and low-emissions technologies. If fossil fuel subsidies, such as those for coal, are not phased out or transferred toward renewable energy, the carbon price won't have a substantial impact. As the government tries to further compensate by providing more subsidies to preserve electricity, the carbon tax may further increase strain on the state budget, if necessary, precautions are not taken.

Despite the fact that the carbon price is thought to have the potential to promote the growth of renewable energy, it must be implemented with prudence. Taking into account the fact that fossil fuels are still produced cheaply in Indonesia even if they are still expensive. In addition, Indonesia still relies up to 90% on fossil fuels for its electricity, thus the implementation of the carbon tax must be carefully planned. According to data on the cost of power generation in year 2019, the cost of coal is IDR 600 per kilowatt hour while the cost of renewable energy such as solar power plants is IDR 11,000 per kilowatt hour, so the comparison of the price difference that seems too great between both will raise question whether renewable energy has competitive price. The high cost for renewable energy used

will have an impact on the cost of power generation. The production sector, among others, will be impacted by the high cost of renewable energy, and ultimately, the community as the final consumer, too, will be impacted by the rise in the cost of goods and services. As a result, Indonesia's carbon tax policy calls for more exact calculation planning and consideration of the kind of renewable energy policy that will be promoted to lower carbon emissions.

To reach a 23% renewable energy mix by 2030, the Indonesian government is pushing solar power generation as one of its renewable energy sources. One item to take into account is the fact that steel and copper, two materials used to make solar panels, must be obtained through mining, which also generates carbon. When carbon emissions from fossil fuels decline due to lower emissions, yet mining activities raise carbon emissions on the other side, this might lead to issues. To prevent the formation of higher production costs that will have an effect on the economy and society, the government needs to implement policies with accurate fiscal calculations and rigorous research. Instead of being used for tax revenues as in general, namely for state financing and development needs, carbon tax revenues are anticipated to be used for activities that encourage the reduction of carbon emissions, such as investing in machinery with green industrial technology to combat the effects of climate change. In an ideal world, certain expenses would be covered by the carbon tax in order to lower carbon emissions.

As in other nations, the process of creating a carbon tax is drawn out, but if it is designed and priced properly, it can increase revenue for the government while also hastening the decrease of emissions. Indonesia's goal of reducing emissions by 29% in 2030 might be aided by a combination of infrastructure and policies that invest the proceeds from the carbon tax in low emission technology. Regarding its ability to influence behavior toward low-emission development, the current carbon tax rate raises various concerns. Businesses would be reluctant to switch to and invest in sustainable business models because there aren't any alternatives to renewable technologies and no effective carbon pricing policies. The optimal carbon tax for Indonesia will need to be calculated, especially with the cost incurred by enterprises and their recovery attempts following covid-19.

CONCLUSION

The Indonesian government is putting out a step-by-step emissions reduction scheme to regulate the carbon trading, including incentives based on achievement in reducing greenhouse gas emissions and enacting a carbon tax. A carbon price on coal-fired power stations will be put in place in stages starting in 2022. This price will also have an impact on emissions from other economic sectors, with the goal of lowering overall national greenhouse gas emissions. Making a carbon tax a part of Indonesia's tax code was the first step in creating the country's carbon tax plan. The basic minimum carbon tax rate in Indonesia is USD 2.11 per tonne, although the Tax Bill specifies that the price would be equal to the market price of carbon. Additionally, the actual tax will be decided by the Ministry of Finance.

If the government could consider case studies where carbon taxes were used to build a renewable energy ecosystem within the appropriate timeline, it might be possible to improve the design of the carbon tax in Indonesia in comparison to other countries' experiences in Asia, such as India, Japan, China and Singapore. In order to generate incentives to cut emissions, the installation of a carbon price must be accompanied with enough renewable energy options and low emissions technology. Businesses would be reluctant to change and invest in sustainable business models given the lack of renewable technology alternatives and efficient carbon pricing regimes.

Before diving into the actual design of the tax, it may be helpful to complete some preliminary work after a government decides to enact a carbon tax. Experience has shown that establishing a thorough understanding of policy objectives and national circumstances at the

outset helps create a robust framework for wise decision-making. Meanwhile, economic models contribute to the understanding of the potential impacts of various design options on important policy goal.

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