

# Analysis of Implementation of Carbon Tax Policy in Efforts to Address Climate Change Issues with Studies in Australia, Japan, Colombia, and Indonesia

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## Research articles

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**Abstract:** The Indonesian government's commitment to reducing carbon emissions in order to handle climate change, one of which is the carbon pricing policy implemented through the carbon tax instrument. However, in practice, the implementation of the carbon tax has been delayed until 2025. This research is done to know about how carbon tax rate, and the implementation of carbon tax policies in Australia, Japan, and Colombia is then compared to the planned implementation in Indonesia based on Law Number 7 of 2021. The research method used is comparative qualitative, with data collection methods in the form of documentation and literature study. There are several things that deserve review in the implementation of this carbon tax policy, including those related to governance, regulatory arrangements, and economic and social preparedness.

**Keywords:** Climate change; carbon tax; carbon pricing; Australia; Japan; and Colombia.

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## 1. Introduction

Climate change is one of the environmental issues of global concern, including Indonesia. According to the International Energy Agency (IEA), total carbon emissions globally in 2021 will reach 36.3 gigatonnes of CO<sub>2</sub>, an increase of 6% from the previous year, and most of them are caused by burning coal and natural gas. If left unchecked, climate change and carbon emissions will increase the risk of social and economic conflict. In response to climate change, the United Nations Framework Convention on Climate Change (UNFCCC) was formed in June 1992 as a manifestation of the seriousness of countries in the world to address climate change. The Paris Agreement is one of the agendas implemented in 2016 to respond to the issue of climate change and was signed by approximately 190 countries including Indonesia. The agreement stipulates to take action to limit global warming below 2°C with a final target of 1.5°C in order to avoid climate change by limiting global warming below 2°C and eventual target at 1.5°C. The Paris Agreement resulted in an agreement regarding the Nationally Determined Contribution (NDC) which regulates and projects the potential for reducing greenhouse gas emissions. As well as the implementation of the 26th Conference of the Parties (COP) in November 2021, which encourages related countries to achieve Net Zero Emissions (NZE) by 2050.

Indonesia ranks fifth in the category of countries with the largest cumulative carbon emissions, with a total carbon emission of 102,562 GtCO<sub>2</sub> (Mutia 2022) . This means that

Indonesia also plays a role in global climate change. As an archipelagic country, Indonesia is vulnerable to the impacts of climate change. Indonesia experienced a trend of increasing temperature of around 0.03° C per year in the 1981-2018 range (BMKG nd) and an increase in national greenhouse gas (GHG) emissions of around 4.3 percent per year in the 2010-2018 range (KLHK, 2020). The Indonesian government continues to work on addressing climate change issues by passing regulations on climate change prevention such as Law Number 16 of 2016, also establishing a long-term low-carbon strategy and climate resilience in 2050 and setting targets for reducing greenhouse gas (GHG) emissions. within the framework of a defined commitment (NDC) of 29% on its own and 41% with international support by 2030 and set a target of net zero emissions by 2060 or sooner. In the economic sector, fiscal policy can be a solution that can be implemented by the Indonesian government in efforts to reduce carbon emissions. An alternative policy that can be applied is the Carbon Tax policy.

Carbon tax is a tax imposed on the burning of carbon-based fuels such as coal, oil and gas (Carbon Tax Centre, 2020) and is a policy created to reduce and eliminate the use of fossil fuels whose burning can damage the climate with tariffs and implementation mechanisms that are varied. Several countries have earlier obtained state revenues from carbon emissions through carbon tax schemes, Indonesia can follow these countries as an example. Like Finland as the first country to implement a carbon tax in 1990. Then this step was followed by 18 other European Union countries such as Poland, Norway, Switzerland, and others. Then other countries that implemented it, namely, India in 2010, Japan (2012), Australia (2012), Mexico (2014), Colombia (2016), Chile (2017), and South Africa (2019). Meanwhile in Southeast Asia, only Singapore has implemented it in 2019.

The seriousness of the Government of Indonesia in implementing a carbon tax is shown by establishing Law Number 7 of 2021 (UU HPP) article 13 and Presidential Regulation Number 98 of 2021 as the legal basis for imposing carbon taxes. In Law Number 7 of 2021, it has been stipulated that the Indonesian government will impose a Carbon Tax on April 1, 2022, with plans to impose it on bodies engaged in coal-fired power plants with a cap and tax scheme, but its implementation has been postponed until July 1, 2022. and again, postponed until 2025. The postponement is because the government still sees the global uncertainty factor in terms of the domestic economy which keeps energy prices high and requires more mature preparations for the entire ecosystem. The Indonesian government is still delaying implementing a carbon tax and has no experience with imposing one. Thus, making a comparison between the draft implementation of Law Number 7 of 2021 and the implementation of carbon taxes in countries that have previously implemented carbon taxes will be very useful. This comparison is made by looking at the differences in the mechanisms applied, the tariffs set, the imposition system, as well as the challenges, and the impact of imposing carbon taxes on carbon emissions in the countries concerned.

Australia and Japan both implemented carbon taxes in 2012 with different rates and implementation schemes. Australia charges a rate of AUS\$24.5 per tCO<sub>2</sub> and covers about 60 per cent of GHG emissions, including carbon emissions from electricity generation and fuels used in industry, mining and waste management (Elsa and Utomo, 2022) . However, the implementation of this carbon tax has been controversial among politicians and entrepreneurs. Until finally, the Australian Senate decided to revoke the carbon tax in 2014. Meanwhile, Japan set a carbon tax rate of JPY 2.89 per tCO<sub>2</sub> or US \$ 2.65 and was considered too low and did not meet international scientific recommendations. In addition, Colombia is one of the tropical countries that implemented a carbon tax in 2016.

Thus, Australia, Japan, and Colombia will be used as comparator countries because (1) Indonesia; Australia and Japan are countries with the largest carbon emissions, (2) Indonesia and Japan have collaborated in reducing carbon emissions since 2013, (3) Indonesia can take

lessons from Australia's failure to implement a carbon tax, (4) Indonesia and Colombia are tropical countries and developing countries. There are several previous studies that have become references and references for writers in writing this research. The first research compiled by (Elsa and Utomo, 2022) regarding the Readiness to Implement Carbon Pricing in Indonesia with Studies in Canada, Great Britain and Australia which focuses on weaknesses and advantages of carbon taxes and cap-and-trade schemes in carbon pricing . Subsequent research by (Gokhale, 2021) entitled Japan's carbon tax policy: Limitations and policy suggestions focuses on recommendations for carbon tax reform in Japan. Other research was compiled by (Harsono, Sapulete, and Wardhana 2017) regarding the Failure to Implement Carbon Taxes in Australia.

## **2. Literature Review**

### **2.1. Climate Change**

Climate change refers to long-term changes in temperature and weather patterns caused by human activities primarily due to the burning of fossil fuels such as coal, oil and gas and the release of gases such as carbon dioxide (CO<sub>2</sub>), nitrogen oxides (N<sub>2</sub>O), methane (CH<sub>4</sub>), and other substances into the atmosphere, which can increase the temperature of the earth (United Nations Indonesia, 2023). Several factors can cause climate change, namely, natural processes that occur in the atmosphere to the biosphere which are internal factors. Meanwhile, the influence of the activities of living things, especially humans on climate is an external factor. Climate change can affect directly or indirectly on human activities. The increase in the earth's temperature can affect the climate system and various aspects of changes in nature and human life. Such as extreme weather, decreasing water quality and quantity, and increasing disease outbreaks. The UNFCCC explains that adaptation to climate change is an effort to find and implement ways of adapting to climate change. Such as health adaptation, food security, ecosystems and water, and energy independence. Meanwhile, in climate change mitigation efforts, countries participating in the United Nations Framework Convention (UNFCCC) have an obligation to issue national policies to regulate and carry out climate change mitigation efforts, by reducing carbon emissions from human activities.

### **2.2. Carbon Pricing**

Carbon Pricing is an instrument that collects external costs from greenhouse gas (GHG) emissions and ties them to GHG sources through pricing which is usually in the form of the price of carbon dioxide (CO<sub>2</sub>) emitted. Carbon pricing gives emitters a choice whether they want to stop their emission-generating activities, reduce their emission income, or continue emission income and pay for it.

Referring to the page (Fiscal Policy Agency, 2021), Carbon pricing consists of several instruments, including;

#### **1) Trading Instruments**

- Trading System (ETS) is a transaction mechanism for emission permit certificates between entities that require additional emission permits and other entities that have excess emission permits. In general, the types of emission permit trading include cap-and-trade and baseline-and-credit systems.
- Offset (Crediting Mechanism), is a form of compensation from an entity that has generated GHG emissions by carrying out mitigation actions to reduce emissions elsewhere.

#### **2) Non-Trading Instruments**

- Taxes or levies on carbon (carbon tax), are a form of compensation from an entity that has generated GHG emissions by carrying out mitigation actions to reduce emissions elsewhere. Charged on carbon content or carbon emitting activity.
- Result-Based Payment (RBP) is a payment mechanism that is given for success in reducing GHG emissions through certain mitigation actions that have been agreed upon between program implementers and fund providers, and diversification by the UNFCCC Secretariat or a technical team appointed by the UNFCCC.

The World Bank (2021) states that there are two carbon pricing schemes that are generally used by many countries in the world, namely the Emission Trading System or what is often also called the Cap-and-trade system and carbon tax. Furthermore, according to (Barus and Wijaya 2022) it is stated that there are 5 (five) recommendations for carbon pricing schemes that can be implemented, namely:

- 1) Cap-and-Trade System.  
A system where the government can set emission limits for each entity, and if the entity produces emissions exceeding a predetermined limit, then the related entity must buy emission allowances from other companies that have the remaining emission limits.
- 2) Carbon tax.  
A scheme in which the government simply sets tariffs and mechanisms for each carbon emission produced (Aldy and Stavins 2012) .
- 3) Emission-Reduction-Credit system.  
A system in which companies that produce carbon emissions below a specified limit will be given credit or certificates that can be used as assets that are economically valuable because they can be traded with other companies that require credit and can be stored for use in the future.
- 4) Clean Energy Standard.  
Standards made by the government to regulate the criteria for environmentally friendly technologies recommended for use by entities. It is hoped that each of these companies can slowly switch to low-carbon technologies.
- 5) Eliminating fossil fuel subsidies.  
This mechanism obliges related countries to stop subsidies on fossil fuels which will affect the level of people's consumption of fossil fuels and have an impact on increasing the amount of greenhouse gas emissions.

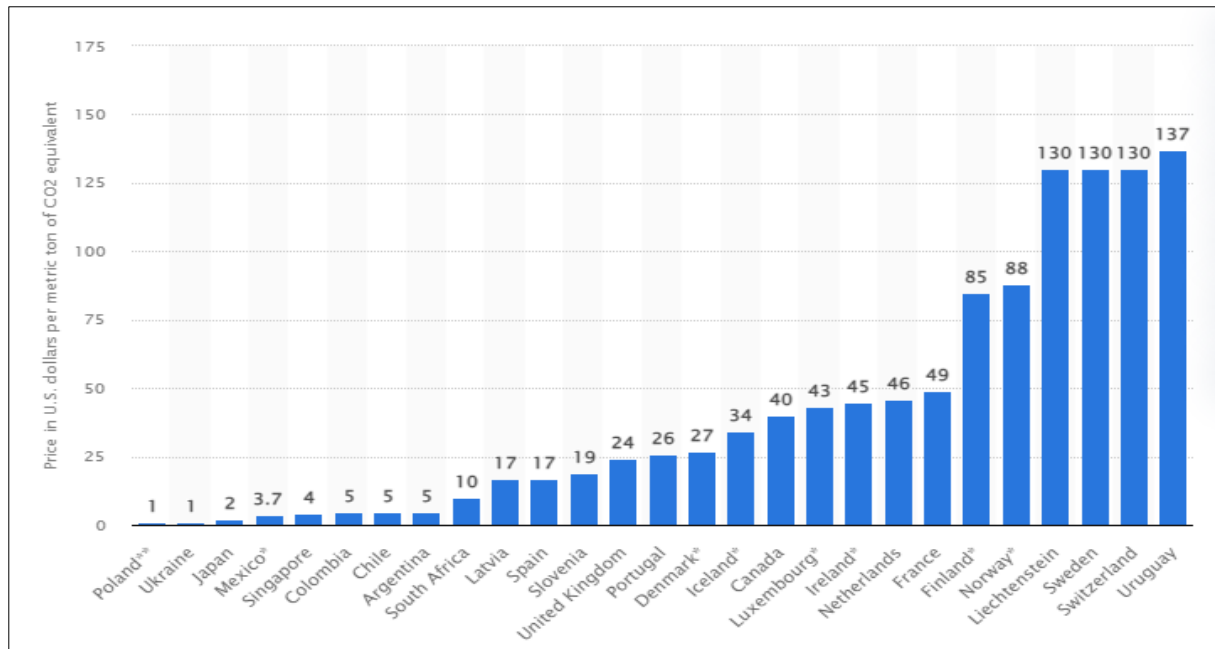
### 2.3. Carbon Tax

Carbon Tax or carbon tax is a tax imposed by the government on individuals or entities for each carbon emission issued both from production activities and consumption activities. Carbon taxes will be imposed on the use of goods/services that produce carbon emissions from a consumption perspective, while it will be imposed on industries that produce carbon emissions in the manufacturing process from a production perspective (Tax Foundation, 2020). The following are carbon tax categories:

**Table 1.** Carbon Tax Category

Emissions Based Tax	Taxes on carbon-containing goods and services
Carbon taxes based on how many emissions companies or individuals produce. Example: Carbon tax per unit on a factory.	A carbon tax that is applied to the final price of an item based on how carbon strong the item or production of that item is. Example: Gasoline, plastic, and motorized vehicles.

For each country that implements a carbon tax, the rate and level of the carbon tax is determined by the government. Carbon tax rates are the actual price countries charge for each metric ton of CO<sub>2</sub> they produce. The figure below illustrates the carbon tax rates that vary by country. There are no clear provisions regarding the setting of carbon price rates, apart from the country's ability to pay taxes.



**Figure 1.** Worldwide Carbon Tax Rates as of April 1, 2022

### 3. Research Methods

In this research, the research method applied is comparative qualitative method. Qualitative research is research that intends to understand phenomena about what is experienced by research subjects, for example perceptions, behaviors, actions, motivations, etc., holistically, and by means of descriptions in the form of words and language, in a specific context that naturally and by utilizing various natural methods (Lexy J. Moleong, 2010:6). Meanwhile, comparative research is research that compares the presence of one or more variables in two or more different samples (Sugiyono 2013). In collecting data, the authors used the method of literature study and documentation using secondary data, due to the limitations of the authors to have direct dialogue with related parties, namely the tax authorities in Australia, Japan and Colombia. However, considering the issues discussed are still relatively new designs and have not been implemented in Indonesia so that not all data can be obtained.

### 4. Results and Discussion

#### 4.1. Implementation of Carbon Tax in Australia, Japan, and Colombia

##### 4.1.1. Application of Carbon Tax in Australia

Australia is one of the world's largest carbon emitters. This is due to the use of coal as 75 percent of the main fuel for their power plants. However, the Australian Government is serious about reducing carbon emissions as evidenced by ratifying the Kyoto Protocol in December 2007 and endorsing a target of reducing emissions by 80 percent below 2000 levels by 2050 (Centre For Public Impact, 2017). After going through a long journey and various



debates, in 2011, the Australian Parliament which was then led by Prime Minister Julia Gillard introduced plans to implement a carbon tax starting in July 2012 and passed The Clean Energy Regulator Act or the Clean Energy Act in November 2011 which introduced Emissions Trading System (ETS) with a cap-and-trade system.

In July 2012, Australia implemented carbon pricing in the form of a carbon tax after going through various debates over the years, which aims to improve Australia's economic transition, reduce pollution, and provide benefits to low to middle income people. The carbon tax is charged at AUS\$23 per tCO<sub>2</sub> or equivalent to US\$24 and will be applied to the highest carbon emission contributors in Australia and is estimated to be able to reduce around 159 million tCO<sub>2</sub> of carbon pollution from the atmosphere in 2020. The carbon tax is planned to increase every year and will switch to a cap-and-trade emission trading scheme on 1 July 2015 with reference to the Clean Energy Regulator Act 2011. The proceeds from the carbon tax revenue will be used as incentives for reducing income tax, social welfare, and increasing pension benefits. The law also contains support and compensation mechanisms.

Clean Energy Regulator Act 2011 (Commonwealth of Australia 2011), has regulated a carbon emission pricing mechanism in which responsible entities or companies must pay and report annually about their emissions or potential emissions they produce in relation to the 2012-2013 and 2013-2014 financial years based on the National Greenhouse and Energy Reporting Act 2007. It accounts for around 60 per cent of Australia's carbon emissions including from power generation, stationary energy, landfills, wastewater, industrial processes, and fugitive emissions. In the first year (2012-2013), carbon units can be purchased from the Clean Energy Regulator for a fixed price of AUD\$23 per unit, and in 2013-2014, carbon units can be purchased for AUD\$24.15 per unit. Meanwhile, if the responsible entity does not deliver one or enough units, it will be subject to a 'unit shortfall charge' determined at 130 per cent of the fixed price for the relevant financial year and multiplied by the insufficient number of units (Clean Energy Regulator Australian Government, 2021).

However, in its implementation, the carbon tax received an unfavorable response from the public and became a subject of debate among Australian politicians, namely between the Labor party and the Liberal camp. Then, in July 2013, under the leadership of Prime Minister Kevin Rudd, it was announced that it would "stop" carbon taxes and moved to an emissions trading scheme (ETS) in 2014 – a year earlier than planned. He plans to remove the fixed carbon price of \$24.15 per tonne, replacing it with a floating price of perhaps \$6-12 per tonne. Finally, after Tony Abbott won the federal election, in 2014, the carbon tax policy was abolished. He plans to change the policy with a compensation of AUS \$ 2.55 billion to help the industry reduce its emissions and switch to low-carbon technologies.

The imposition of a carbon tax in Australia has had a positive impact on reducing carbon emissions, where the level of carbon emissions in 2011 was 17.59 t tonnes/capita reduced to 16.92 tonnes/capita and continued to decline until 2014 amounting to 15.81 tonnes/capita. In addition, the implementation of a carbon tax has an effect on reducing gross added value, company costs and profits, and consumer prices (Harsono et al. 2017). There is an increase in unemployment, and economic costs on exports. Australia is the first country to fail to implement a carbon tax policy, which is considered too repressive. As a result, there is a decline in economic growth and an increase in energy tariffs. Although the tax initially increased state revenues, the introduction of a carbon tax led to a deficit in the state budget and an increase in public debt.

#### ***4.1.2. Implementation of Carbon Tax in Japan***

Japan, as one of the world's largest carbon emitting countries, is a country that is actively

implementing measures to reduce its carbon emissions. In 1997, Japan hosted the third formal meeting of the United Nations Framework Convention on Climate Change (UNFCCC) in Kyoto and co-signed the Paris Agreement in 2015. Furthermore, in 1998, the Japanese government ratified the 'Law Concerning Promotion of Measures to cope' with Global Warming' as a form of fulfilling the commitments of the Kyoto Protocol, which encourages households and certain entities to reduce greenhouse gas emissions (Gokhale 2021). However, due to the existence of a 'Voluntary Action Plan' proposed by an influential organization, namely the Japan Business Association (Keidanren), the law underwent changes, namely requiring that emission reductions be carried out voluntarily. Thus, a significant reduction in carbon emissions is not realized. In 2005, the Japanese government implemented the Voluntary Emissions Trading Scheme (JVETS), whereby participating companies are given incentives by expanding subsidies and allowances are provided free of charge based on emission reduction targets set by each company.

In 2009, the Government of Japan submitted the Basic Law on Combating Global Warming to parliament. The law outlines a medium-term goal of reducing GHG emissions by 26% below 1990 levels as well as a long-term goal of 80% below 1990 levels by 2050. Proposed measures to achieve this target also include a carbon tax and stamp -and-trade. Then, in 2010, the Democratic Party of Japan (DPJ) also attempted to implement a mandatory national emission cap and trade scheme as part of the Basic Law on Environmental Regulations on Global Warming Measures. However, no mechanism has succeeded in reducing carbon emissions. The national emission trading plan was stopped due to opposition from the Ministry of Economy, Trade, and Industry (METI), Keidanren, and industry, citing concerns that it would have a negative impact on competitiveness and the international economy (Ishi, 1995; Lee et al., 2012). The implementation of JVETS was not successful and was finally discontinued in 2012, because it only resulted in emission reductions of 0.03 percent and lack of participation from related companies. Instead of cap-and-trade, the DPJ opted for a carbon tax, primarily to overcome Keidanren's opposition and at the same time to fulfill at least part of its commitment to GHG reduction.

After the disastrous earthquake in March 2011, which destroyed a nuclear power plant, all of Japan's nuclear reactors were shut down. Political and public attention is turning to energy savings and alternative sources. Implementation of ambitious climate policies is becoming less focused, and Japan is shying away from nuclear power and expanding use of fossil fuels. However, there is a strong political push towards the introduction of a carbon tax as a measure to mitigate global warming and save energy. The tax is officially called the Global Warming Tax because its main goal is to tackle global warming by reducing GHG emissions. Finally in 2012, the Revised Global Warming Tax Tax Reform based on the proposal of the DPJ, was passed by the House of Councilors on 30 March.

Finally In October 2012, Japan introduced a carbon tax as one of its tax reform policies with an applied rate of JPY 2.89 per tonne of CO<sub>2</sub> or \$2.65. The carbon tax rate is considered too low and does not meet international scientific recommendations. The IMF encourages G20 countries to implement a carbon tax of \$35/t-Co<sub>2</sub> (floor) and \$70/tCo<sub>2</sub> (upper limit). Thus, there should have been an increase in the annual tax rate, but this increase has been stalled since 2016. Japan is also a pioneer country in Asia to implement a carbon tax with a view to reducing 80% of greenhouse gas emissions by 2050. The tax applies to fossil fuels such as oil petroleum, oil products, coal, and natural gas. Tax rates are adjusted to Tax products and are income neutral. The resulting carbon tax revenue is directed towards complementing renewable energy projects and for enhancing energy saving measures.

The Japanese government is working to set up a market for carbon credits to reduce GHG emissions through an appropriate domestic carbon pricing scheme, and to make Japan

a carbon emissions trading center for Asia. Japan's Ministry of Trade and Industry has set a target to establish a demonstration carbon credit market in the April 2022-March 2023 fiscal year. Each Japanese carbon credit market is likely to start by incorporating a Joint Crediting Mechanism (JCM), J-Credit, fuel energy certificate non-fossil. and voluntary credit (Lewis 2022) . However, in 2022, Japan decided to postpone its planned carbon tax reform until April 2023. Claiming the reform would add to people's already soaring costs of living. This will make it more difficult for Japan to achieve its net-zero-emissions target by 2050 and cut greenhouse gas emissions by 46 percent. Resource- deficient Japan is heavily dependent on fossil fuels for power generation and driving the economy, so natural gas and coal are used in most power plants.

#### 4.1.3. Implementation of Carbon Tax in Colombia

Colombia is one of the countries that signed the Paris Agreement in 2015, even though Colombia is not one of the world's largest carbon emitters, with an average participation of only 0.34% in these carbon emissions. In addition, Colombia is a country of high vulnerability to climate change (Aristizábal Alzate and González Manosalva 2019) . Thus, Colombia seeks to reduce carbon emissions and low-carbon development.

Carbon taxes have been implemented by Colombia since 2016 through the Congress of the Republic of Colombia (2016), with the hope of changing the behavior and consumption patterns of taxpayers for legitimate constitutional reasons, such as environmental protection through carbon emission mitigation. The aim of its implementation is to reach a balance point between economic activities that generate emissions, in such a way that environmental damage can be mitigated, and restored. The policy is based on the Structural Tax Reform Act 1819 of 2016 in which the national carbon tax, is one of the first actions that the state undertakes and one of its main economic instruments to achieve a 20% reduction in emission levels by 2030.

The rate set for this carbon tax is COL\$16,422 per tonne of CO<sub>2</sub> or the equivalent of \$ 5.5 USD (2019). The tariff is applied to the elemental content of all fossil fuels including petroleum derivatives used for combustion purposes. Colombia also applies different tariffs according to fossil fuels with carbon dioxide equivalent units. As shown in the table below.

**Table 2.** Colombian Carbon Tax Value per Fossil Fuel

Fossil Fuel	Unit	Fee
Natural gas	m <sup>3</sup>	US\$ 0.0107
Liquefied petroleum gas	Galón	US\$ 0.0347
Gasoline	Galón	US\$ 0.0493
Kerosene & Jet Fuel	Galón	US\$ 0.0540
ACPM (diesel fuel)	Galón	US\$ 0.0543
Fuel Oil	Galón	US\$ 0.0647

The Congress of the Republic of Colombia (2016) has decreed that carbon tax revenues collected under this new green economy mechanism will be channeled to the Fund for Environmental Sustainability and Sustainable Rural Development in conflict-affected areas, for managing coastal erosion, conservation of water resources and protection of ecosystems, according to with the guidelines set for this purpose by the Ministry of Environment and Sustainable Development (MADS). Regarding the effectiveness of the carbon tax, it is expected to change the pattern of consumption of fossil fuels by users of these energy sources. Just as the national tax on plastic bags has worked, which since its implementation has allowed



Colombians to reduce their consumption by up to 27% or reduce their use of plastic (Aristizábal Alzate and González Manosalva 2019) .

On the other hand, the expected results from a carbon tax will be difficult to achieve, given that there are few viable alternatives, technologies and substitute energies to replace the use of fossil resources, other than legal loopholes, and huge investments are required to make the right transition to energy efficient. cleaner (Aristizábal Alzate, González Manosalva, and Mogollón 2019) . In addition, the cost of GHG emissions falls directly on burning fossil fuels to obtain heat energy, which excludes other sources that produce GHGs, such as landfills, where due to the anaerobic degradation of organic waste, large amounts of GHGs are generated including methane (CH<sub>4</sub>). Until 2019, the implementation of carbon taxes managed to reduce 24 percent of emissions.

#### 4.2. Draft Implementation of Carbon Tax in Indonesia

Indonesia is one of the largest carbon emitting countries and a country that is vulnerable to the threat of climate change. In response to climate change, the Government of Indonesia is serious about continuing its commitment to tackling climate change, by setting targets for reducing greenhouse gas (GHG) emissions within the framework of the commitments set in (NDC) . In order to achieve this target, the efforts made by the Government of Indonesia in the economic sector are by proposing the implementation of *carbon pricing* listed in the RUU KUP and the HPP Law which include policies to implement carbon pricing with carbon tax instruments. Meanwhile, the government's preference for carbon taxes over other carbon trading instruments is due to references from experts who argue that carbon taxes are the most cost-effective instrument.

The main objective of imposing a carbon tax is to change the behavior of economic actors to switch to low-carbon green economic activities (Fiscal, 2021b) . In addition to Law Number 7 of 2021 which regulates carbon tax policy drafts, the Government also issued Presidential Regulation Number 98 of 2021 concerning Carbon Pricing (NEK) which includes levies on carbon. The regulation stipulates that the carbon tax rate is set higher or equal to the price of carbon in the carbon market with a minimum rate of IDR 30/kg (CO<sub>2</sub>e) and is imposed on entities engaged in coal-fired power plants under a cap-and-tax scheme . which is in line with the implementation of the carbon market that has started in the coal power plant sector. Reporting from the Fiscal Policy Agency - Ministry of Finance, that the implementation of carbon taxes will be aligned with the carbon trading mechanism. Here's an illustration:

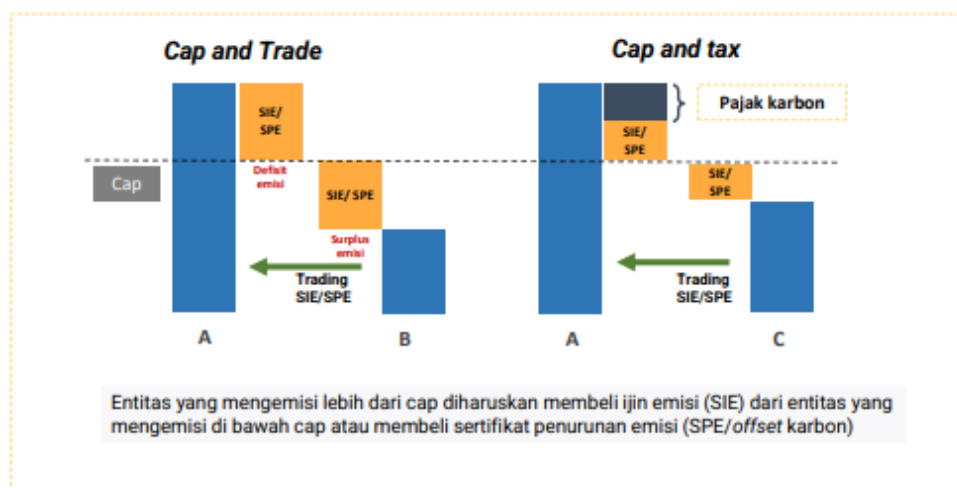


Figure 2. Illustration of Carbon Tax Implementation

#### 4.3. Comparison of Carbon Tax Implementation in Australia, Japan, Colombia and Indonesia

**Table 3.** Comparison of Carbon Taxes in Australia, Japan, Colombia and Indonesia

	Australia (2012-2014)	Japan (2012)	Colombia (2016)	Indonesia (2025)
<b>Rates per tCO<sub>2</sub>e</b>	AUD\$23.00/US\$21.90	JPY 2.89/ US\$3.00	15,000 pesos / US\$4.45	IDR 30,000 / US\$ 2.09
<b>Imposition Sector</b>	All sectors	All sectors	All sectors	Coal power plant sector
<b>Imposition Mechanism</b>	Emissions of carbon dioxide, methane, nitrous oxide and perfluorocarbons from aluminum smelting with a threshold of 25,000 tco <sub>2</sub> e.	All fossil fuels	CO <sub>2</sub> is produced by burning fossil fuels, according to the CO <sub>2</sub> emission factor.	Activities that produce carbon emissions/ Purchase of carbon-containing goods
<b>Imposition Challenge</b>	Debate and rejection in political circles, and unfavorable response from the public and business people	Many adjustments of political and economic interests, low tax rates, lack of alternative resources to replace coal	Few alternatives, technologies, and alternative energies are possible to replace the use of fossil resources and such a transition requires long-term and substantial investment	Coal is the main and largest energy in Indonesia, few alternative energy is possible to replace abra
<b>Imposition Impact</b>	Decrease in carbon emissions, increase in electricity costs, decrease in gross value added as well as company costs and profits, as well as consumer prices	Small impact on carbon reduction, decreased competitiveness in exports because it is not environmentally friendly	Managed to collect 476,862 million pesos in 2017, and succeeded in reducing 24 percent of emissions.	It is estimated that this will affect the increase in electricity prices, as well as affect other businesses. It is expected to reduce carbon emissions

#### 4.4. Factors to be Considered by Indonesia in Preparing to Implement Carbon Tax

With a comparative study of related countries. There are several factors that need to be prepared by Indonesia in implementing the Carbon Tax,

- 1) Paying attention to post-Covid-19 economic recovery and implementing it in stages to see the impact of imposing a carbon tax. As well as the effectiveness of the imposition of the carbon tax
- 2) Regarding the provisions and regulations for implementing carbon taxes and the basis for imposing the tax, whether it is based on fuel consumption or based on carbon emissions. With regulations that are already available, regulations are still needed regarding the technical implementation.
- 3) Public opinion regarding the imposition of a carbon tax, learned from Australia which failed to implement a carbon tax due to the unfavorable response from the community. Given the imposition of a carbon tax, it will affect the increase in fossil fuel prices.
- 4) What sectors are excluded and the determination of the ideal tariff for carbon taxes is crucial and must be in accordance with the environmental damage caused.
- 5) Alternative energy that is in accordance with the readiness of the government and society

as well as outreach and education to the community. Coal-fired power plants are the main producer of electricity in Indonesia. So, it is necessary to reconsider the impact of this tax on the generated electricity capacity.

- 6) Allocation of carbon tax revenue, the government is expected to allocate carbon tax revenue properly and evenly.

## 5. Conclusion

Based on the discussion that has been described previously, it can be concluded that readiness and careful consideration are needed in implementing a carbon tax, to prevent failure in its implementation. Indicators of developed and developing countries are not a determinant of the success of carbon tax implementation. Australia's failure to implement a carbon tax is due to a lack of support from both the government and society. Japan is a pioneer country for carbon taxes in Asia, but the rates charged are still too low. Indonesia as a developing and tropical country can follow the example of Colombia which has succeeded in reducing emissions by implementing a carbon tax.

The Indonesian government has designed the imposition of a carbon tax at a rate of IDR 30/kg CO<sub>2</sub> under a *cap-and-tax* scheme that is expected to be accepted by the public because this rate is considered affordable. With plans to increase over time. Currently, the Indonesian government is still preparing the implementation mechanism. Thus, it can be said that Indonesia's readiness to implement a carbon tax is still lacking. In addition, there is a lack of outreach and education to the public regarding this policy. Further consideration is needed regarding regulations, optimal tariffs, alternative energy substitutes, public opinion, and the allocation of the distribution of carbon tax revenues later. This article was written when the discussion on carbon taxes was still in the policy design stage, so the opportunity for further research when this policy was implemented was still wide open.

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