



DUAL BENEFITS? EXAMINING HOW CARBON TAX INFLUENCES GREEN INVESTMENT AND GOVERNMENT REVENUE IN INDONESIA AND CHINA

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Abstract

This study analyzes the impact of carbon tax on green investment and state tax revenue through a comparative study of Indonesia and China. Carbon tax plays a role in reducing emissions while encouraging the growth of the renewable energy sector. Using qualitative methods with content analysis and scoping review, this study found that carbon tax contributes significantly to green investment and state revenue. China shows global leadership with large investments in renewable energy, while Indonesia, although new to this policy, has great potential if supported by more mature regulations and infrastructure. Carbon taxes have also proven effective in reducing emissions and supporting the transition to a green economy. In conclusion, carbon tax is not only a fiscal instrument, but also a key catalyst in accelerating sustainable economic transformation if supported by consistent policies and cross-sector collaboration.

Keywords: Green investment, Carbon Tax, Tax revenue

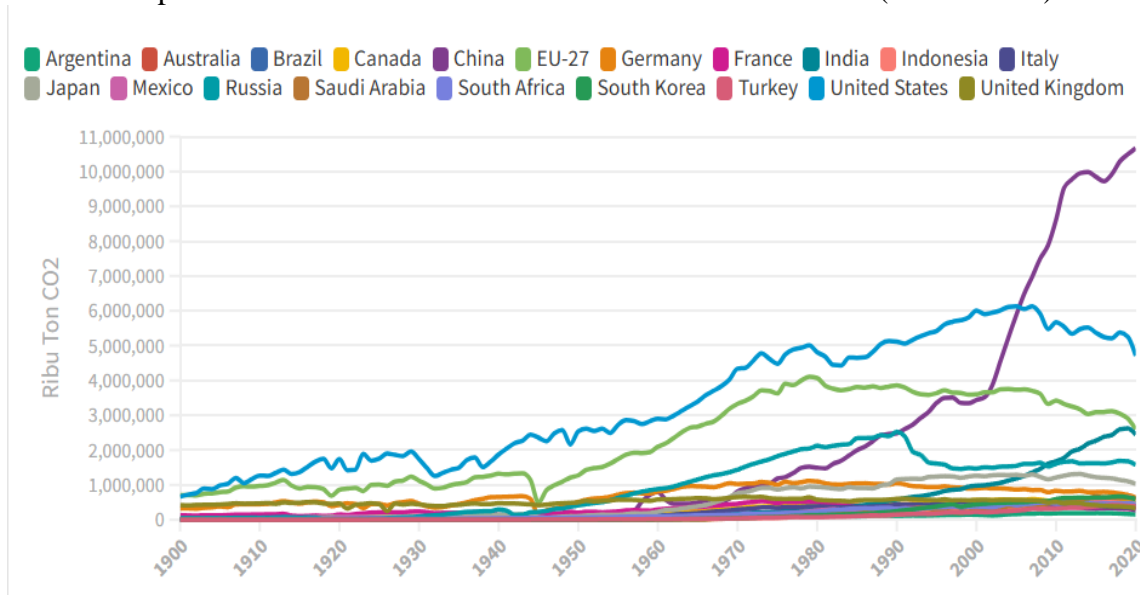
INTRODUCTION

Development in many parts of the world today is geared towards sustainability. Sustainability is a concept that means how to maintain prosperity over a long period of time, perhaps even an indefinitely long period of time, perhaps even an indefinitely long period of time. It largely encompasses the environmental dimension of the triple bottom line (Kuhlman & Farrington, 2010). Sustainability has become a major topic of discussion and a goal to be achieved around the world. Issues related to sustainability began when various countries in the world began to feel that the development carried out today did not have a good impact on future generations (Barus & Wijaya, 2021). One of the impacts of unsustainable development problems is the global warming and climate change that is currently occurring. The factor that causes climate change is the emission of greenhouse gases around the Earth's atmosphere and captures incoming sunlight, this is due to the use of fossil fuels, manufacturing, deforestation, and transportation.

Global warming and climate change are evidenced by data from the World Meteorological Organization (WMO) that in 2023 is the hottest year throughout instrumental observations, which is an anomaly related to temperature changes of around 1.5 ° C. This is supported by carbon emission data in 2023 reaching the highest point of 36.8 billion tons of carbon produced, Furthermore, there is also data from carbon emissions produced by countries in various worlds.



Graphic 1. Annual CO2 Emission Trends of G20 Countries (1990 - 2020)



Source: Our World in Data (2023)

Based on the figure above, countries with a large economic level or can be called the G20 countries produce large carbon emissions. China is the country with the largest contribution to annual CO2 emissions in the world. In 2020, CO2 emissions from China reached 10.67 billion tons, most of which came from production activities, such as coal-fired power plants, coal mining, and the iron and steel production industry. These activities accounted for about 27% of total global carbon emissions. Despite the Covid-19 pandemic, China's CO2 emissions continued to increase in 2020. Overall, between 2000 and 2014, China's annual CO2 emissions increased by more than 6 million tons each year (Our World in Data, 2023). This is the basis that the development carried out by various countries is not development that has a good impact on the long term. Therefore, if the development or activities carried out when it does not have the value of sustainability, the climate change and global warming that the world is now facing cannot be reduced and will most likely have a negative impact on future generations.

The impacts that we can feel from climate change and global warming in the future are health, food crisis, potential natural disasters, biodiversity extinction, rising sea levels. This will also have an impact on socio-economic conditions, health, infrastructure and human life activities. Indonesia has a large population and is vulnerable to the negative impacts of climate change iklim (Kementerian Lingkungan Hidup dan Kehutanan, 2022). Addressing issues related to global warming and climate change. Governments in various countries around the world began to carry out various collaborations and cooperation, one of which was the 2016 Paris Agreement. The Paris Agreement contains countries in the world who agreed to reduce the production of carbon emissions resulting from activities in their countries and this agreement was approved by 195 countries. Countries that participated in signing the Paris Agreement included Indonesia and China. Indonesia itself is one of the countries that produce large carbon emissions. By participating in the Paris Agreement commitment, the Indonesian and Chinese governments must transform to reduce carbon emissions. One of Indonesia's commitments in reducing carbon emissions is Law Number 16 of 2016 concerning Ratification of the Paris Agreement as a form of Indonesia's commitment



to reduce carbon emissions by 29% by 2030 and 41% if assisted by other countries (Selvi et al., 2020).

In 2021 Indonesia enacted Law No. 7 of 2021 on Harmonization of Tax Regulations which indicates Indonesia is implementing a carbon tax. Carbon tax is a tax imposed on transactions of carbon-containing goods or activities that produce carbon emissions, which has a high potential for state revenue. In addition to the potential increase in state revenue, the implementation of carbon tax can also reduce the production of carbon emissions, especially carbon emissions generated from the energy sector as one of the highest contributors to carbon emissions in Indonesia (Pratama et al., 2022). The existence of a carbon tax encourages green investment and state revenue. State revenue increases due to the minimum rate of IDR 30.00 per kg CO₂e (kilogram carbon dioxide equivalent). This tariff is effective April 1, 2022 in the coal-based power plant sector. In 2025 and above, it will be extended to other sectors (transportation, industry, etc.), in accordance with the readiness of the carbon market in Indonesia. The implementation of this regulation is to change the style of society and industry to transform to environmentally friendly energy and activities and achieve zero net emission by 2050 (Pratama et al., 2022).

In 2003, the government actually started imposing pollutant emission fees on industrial companies as a first step towards an environmental tax. Subsequently, China introduced carbon trading mechanisms in several major cities, such as Beijing, Shanghai, and Guangdong in 2010. In 2018, China's Environmental Tax Law came into effect, replacing the pollutant emission fee system. Taxes are applied to air pollutants, water pollutants, solid waste, and industrial noise. Tax rates are determined based on the type of pollutant and environmental impact in each province. And finally in 2021: China officially launched the world's largest Emissions Trading System (ETS), covering more than 2,000 power generation companies with total emissions of about 4 billion tons of CO₂ per year.

The implementation of a carbon tax to achieve zero net emissions by 2050 is also driving the acceleration of green investment around the world. According to data from the International Energy Agency, total green investment by 2024 will reach US\$3 trillion. The increase in green investment will encourage new companies to emerge in the renewable energy sector in the world. Green investment itself in Indonesia has been mandated in laws related to sustainability in the 1945 Constitution Article 33 paragraph 4 concerning National Democracy, one of which adheres to the principle of sustainability (sustainable development) (Mentari et al., 2024). The existence of a carbon tax encourages many countries to invest in Indonesia, one of which is the JCM project in Indonesia has received a grant from the Japanese government of US\$40 million and has received additional investment of US\$70 million for low-carbon development (Kementrian Koordinator Bidang Perekonomian, 2019). Furthermore, the renewable energy industry has begun to emerge in Indonesia with the implementation of the carbon tax.

The emergence of the renewable energy sector will encourage increased state revenue, this is supported by data from the minister of Energy and Mineral Resources that non-tax state revenue from the energy sector reaches Rp. 300 trillion, of which the renewable energy sector contributes Rp. 3.1 trillion, although this figure is low but raises state revenue from the new sector. Furthermore, the existence of this new sector encourages state revenue from taxes, because of course the renewable energy sector is owned by holdings or companies, so that corporate income from renewable energy will still be subject to corporate tax. Seeing the huge impact of carbon tax implementation that encourages green investment and increases state revenue encourages researchers to see how much state revenue from carbon tax, especially for the highest carbon producing countries such as China and Indonesia.



LITERATURE REVIEW

Carbon Tax

Carbon tax is a tax on the residual combustion of fuels used that contain hydrocarbons (Selvi et al., 2020).. Hydrocarbons are chemical substances present in fuels such as coal, natural gas, and petroleum. A carbon tax is a tax imposed on transactions or economic activities that produce carbon emissions from either production or consumption activities (Barus & Wijaya, 2021). The implementation of a carbon tax can provide long-term benefits as it encourages the production sector to reduce energy consumption and associated costs through innovation and installation of low-carbon technologies, allowing companies to become more competitive in the market.

For the consumption sector, carbon mitigation activities can improve environmental quality and reduce the adverse effects of climate change so that it can bring long-term environmental benefits to humans (R. Wang et al., 2016). Therefore, the function of a carbon tax is to reduce the adverse effects of greenhouse gas emissions through a scheme that must be paid by the consumption and production sectors for the use or manufacture of goods and services that produce carbon emissions (Pamungkas & Haptari, 2022). In addition, the benefits of carbon tax are useful to improve the country's economy and improve people's welfare, because the country receives carbon tax revenue from the imposed tariff and can be used to finance other sectors that control the lives of many people and support technological development related to energy renewal (Pamungkas & Haptari, 2022).

Carbon Emission

Carbon emissions are the residual combustion or use of fossil energy, the residual combustion is a gas consisting of CO₂, CH₄, N₂O and fluorinated gases (F-gases) which include perfluorocarbon groups (PFCs), hydrofluorocarbon groups (HFCs) and sulphur hexafluoride (SF₆) and compounds that destroy the ozone layer (Wahyudi, 2019). The largest carbon emissions are generated by the energy, transportation, industry and manufacturing, agriculture and forestry sectors (IPCC, 2021). The year 2022 is a new history for environmental damage because the resulting carbon emissions amounted to 36.8 gigatons, which is a greater increase than in 2021 (International Energy Agency, 2022). When carbon emissions are large enough to accumulate in the ozone layer, adverse impacts such as increased global temperatures, changes in extreme weather patterns, and sea level rise will result (IPCC, 2021).

Green Investment

Green investments inherently involve characteristics such as greater social than economic benefits, high investment costs, and long implementation timeframes, thus green investments refer to investments needed to reduce greenhouse gas and air pollutant emissions, without significantly reducing the production and consumption of non-energy goods (Eyraud et al., 2013). Increasing the share of green investment (GI) is not only a medium-term climate target.

Advocates of investing in low-carbon energy sources also cite the need to improve energy security, reduce the adverse health impacts of air pollution, and find new sources of growth (Eyraud et al., 2013).. Investing in green equipment incentivizes green investments, and facilitating their transition into environmentally sustainable entities has become an important issue (Zhao et al., 2023). The implementation of green investment in various countries provides a perspective of the importance of green investment in promoting the needs of the population in a sustainable manner, especially in preventing global warming and to achieve sustainability (Aprianti et al., 2023).



Environmental Stewardship Theory

Environmental degradation has spread globally. Massive forest fires, increasingly polluted water, increasingly polluted air, are just a few of the impacts of the ecological crisis (Situmorang et al., 2023). The existence of rules related to carbon tax can help to reduce the impact of environmental damage, help the economy and achieve sustainability (Meila et al., 2024).

The theory of environmental stewardship and sustainability has been defined as the responsible management of activities with regard to the health of the environment by being a custodian or caretaker of the environment (van Putten et al., 2014). This theory is seen as an obligation, a moral virtue, or a way to secure future benefits for others (Thompson, 2011). The existence of this theory is useful for all countries in developing their countries with environmental values.

METHODS

This research uses a qualitative method with content analysis to analyze the data and literature identified through the scoping review as complementary research approaches to produce a comprehensive understanding. Content analysis is an approach that examines the content of a message to draw conclusions about the message, by identifying themes, patterns, and other elements to understand the meaning and purpose conveyed (Nachmias, D., & Nachmias, C., 1976). Scoping review is a research approach that aims to identify broad and in-depth literature from various sources with various research methods relevant to the topic under review (Arksey & O'Malley, 2005). The scoping review method aims to identify and summarize information from various international literature, such as journal articles, dissertations, and working papers (Pratama et al., 2022). The information reviewed regarding the implementation of carbon taxes from various G20 countries that have similar characteristics is then grouped and analyzed to produce conclusions

This study uses secondary data obtained from Our World in Data for carbon emissions data, World Energy Investment for total clean energy investment data, and IRENA for renewable energy data for 10 (ten) consecutive years from 2014-2023. The data is used to estimate the amount of potential carbon tax revenue based on consumption from the energy sector and potential revenue from renewable energy. In calculating the potential carbon tax revenue and potential revenue from renewable energy in this study using exponential smoothing. Exponential smoothing is a forecasting method that gives more weight to the latest data for more accurate results, especially in time series analysis (Brown & Meyer, 1961). In the calculation of state revenue from carbon emissions is by multiplying the tariff applied in both countries with the carbon emissions produced.

In the calculation of tax revenue from renewable energy using data from IRENA, this data is to calculate the estimated energy generated using environmentally friendly resources such as geothermal, water, wind and others. Furthermore, using data from PLN and SGCC for the electricity tariff charged, after that estimating the net profit from renewable energy using the percentage of net profit from the total revenue of one renewable energy company, BREN, of 18% and the last tax rate imposed by each country.

The country chosen is a member of the G20 with the largest economy and produces the largest carbon emissions which is used as a comparison for Indonesia in this analysis is China. This study serves as a basis for comparison to analyze how the implementation of a carbon tax could affect two key aspects in Indonesia, namely green investment and state revenue. By looking at the experiences and policies implemented in China as the largest economy and largest carbon emitter, this study aims to provide insights into the potential of implementing a carbon tax in Indonesia.



RESULTS AND DISCUSSION

Carbon Tax in China and Indonesia

Carbon tax is one form of application of the Pigouvian Tax concept, which is a tax imposed on economic activities that cause negative externalities, such as environmental damage or air pollution (Pigou, 1993).. Pigouvian tax is designed as a policy that requires those who pollute the environment to bear the costs of the pollution they cause. This policy aims to internalize the social costs of pollution, such as ecosystem damage, air quality degradation, and negative impacts on public health, thereby encouraging economic actors to shift to more environmentally friendly practices. Countries in the world in 2023, especially those in the G20, will produce 37.79 billion tons of CO2 gas. This year, the largest CO2 gas producing country is China with 11.9 billion tons (ourworldindata, 2024).

Indonesia produces CO2 gas data of 733 billion tons. The existence of CO2 gas produced is very large in various countries, causing many countries to make policies to reduce the carbon emissions produced, especially Indonesia and China. Indonesia through Law No. 7 of 2021 on Harmonization of Taxation Regulations issued a policy related to the imposition of tariffs on all carbon-emitting activities, especially industry at IDR 30.00 per kg CO2e. Furthermore, in China carbon trading is a tool used by the government to reduce carbon emissions. Until now, China has been very cautious in imposing tariffs on carbon trading because it will have an impact on the Chinese economy even though it uses the lowest imposition limit of 10 yuan (Salsaibila, 2023).

In the discussion of table 1, the tariff on carbon trading will be used as the basis for calculations if china will implement a carbon tax tariff equal to carbon trading. implementing a carbon tax tariff in indonesia and a carbon trading system in china will help reduce pollution from carbon emissions while increasing state revenue.

Table 1. Carbon Tax Revenue Potential in Indonesia and China

Year	Carbon Emission in Indonesia (Kg)	Carbon Emission in Cina (Kg)	Indonesia's Revenue Potential	Cina's Revenue Potential
2014	487.889.950.000	9.990.257.000.000	14.636.698.500.000	226.479.126.190.000.000
2015	539.149.250.000	9.863.457.000.000	16.174.477.500.000	223.604.570.190.000.000
2016	540.085.600.000	9.762.714.000.000	16.202.568.000.000	221.320.726.380.000.000
2017	556.944.200.000	10.006.343.000.000	16.708.326.000.000	226.843.795.810.000.000
2018	594.101.400.000	10.332.993.000.000	17.823.042.000.000	234.248.951.310.000.000
2019	653.791.600.000	10.713.984.000.000	19.613.748.000.000	242.886.017.280.000.000
2020	608.223.200.000	10.905.693.000.000	18.246.696.000.000	247.232.060.310.000.000
2021	619.622.400.000	11.447.913.000.000	18.588.672.000.000	259.524.187.710.000.000
2022	737.072.640.000	11.350.538.000.000	22.112.179.200.000	257.316.696.460.000.000
2023	733.223.940.000	11.902.503.000.000	21.996.718.200.000	269.829.743.010.000.000
Total Revenue Potential			182.103.125.400.000	2.409.285.874.650.000.000
Average Revenue			18.210.312.540.000	240.928.587.465.000.000



Source: Data processed by the author (2025)

Based on the calculation of the potential state revenue from the implementation of carbon tax in Indonesia and the estimated implementation when China implements carbon tax policy from 2014-2023, Indonesia will generate new additional revenue of Rp18 trillion per year, this can be realized if the application of carbon tax is already in all industrial sectors, because the carbon emission data obtained is data generated by all carbon-generating activities in Indonesia while currently the application of carbon tax in Indonesia is still applied to PLTU and China will get Rp240 trillion per year if the application of carbon tax is done with the current assumption of using the lower limit on the carbon trading system in China of 10 yuan. This calculation will always change, because it depends on the carbon emissions produced. In addition to considering the state revenue from the implementation of carbon trading or carbon tax, both countries must look at the economic potential or impact of this implementation. The implementation of carbon tax tariffs will increase the cost of energy production in both countries and experience economic contraction considering that Indonesia and China are still dominated by the PLTU sector, the most significant difference is that China is more aggressive in developing renewable energy compared to Indonesia. So China will be better prepared in the future to handle economic contraction compared to Indonesia.

Despite the contraction in the economy, the new source of revenue from the carbon tax serves to stabilize the economy. This is achieved when the revenue is allocated to renewable energy investments and to subsidize the sectors that are most affected by the carbon tax. This makes the future impact of the tariff less burdensome for the industry as the subsidies will gradually disappear when 90% of Indonesia's and China's energy sources are not supported by fossil fuels that produce high carbon emissions. The imposition of tariffs on carbon in Indonesia and carbon trading by the Chinese government is a commitment to protecting the environment, as well as a form of tangible evidence in implementing the Paris Agreement in 2016.

The implementation of a carbon tax can reduce carbon emissions as evidenced by the research of Alton et al. (2014) which states that the implementation of a carbon tax aims to initiate a more environmentally friendly economic transition and reduce future emissions more quickly. Carbon tax policy can effectively reduce emissions, although it can have an impact on social and economic welfare (Duan et al., 2021). In a study conducted by Kohlscheen et al. (2024) showed that increasing carbon tax by \$10 per ton of CO₂ can reduce CO₂ emissions per capita by 1.3% in the short term and 4.6% in the long term. Then, in a study conducted by Pusparini et al. (2023), compared carbon tax and Ultra Low Emission Zone (ULEZ) policies in reducing carbon emissions in Indonesia. The results show that carbon tax is more effective and efficient to implement in Indonesia based on variables of carbon emission reduction, tax revenue projection, and implementation efficiency. Thus, an economically significant carbon tax serves to reduce carbon emissions, especially those caused by fossil fuel products such as gasoline, aviation fuel, and gas, by reducing fuel consumption and CO₂ emissions (Zhou et al., 2018).

Carbon Tax in Creating Green Investment to Increase State Tax Revenue

Increasingly apparent climate change due to greenhouse gas emissions has prompted countries to take serious steps to reduce dependence on fossil fuels. One widely implemented policy is the carbon tax, a market-based policy designed to reduce carbon emissions by imposing a fee on fossil fuel consumption based on its carbon content. The tax aims not only to incentivize emissions reductions, but also to generate government revenue that can be allocated to various initiatives related to climate change mitigation (Muhammad, 2022).. In the long run, this policy will not only reduce carbon emissions, but also encourage innovation in the clean energy sector



and accelerate the transition to a green economy. Increased production costs due to the carbon tax may pose short-term challenges for fossil fuel-dependent industries, including the risk of job losses in high carbon intensity sectors. However, these changes also contribute to the growth of the renewable energy sector, drive structural economic transformation and spur long-term innovation (Bohr et al., 2024).

As the cost of fossil-based energy rises, renewable energy is becoming increasingly competitive, attracting investors to invest in low-carbon technologies such as solar, wind, biomass and hydrogen. This shows that a carbon tax is not only a fiscal instrument, but also a strategic tool in driving fundamental changes in the global energy system. The implementation of carbon taxes in various countries has proven to be a catalyst for the growth of green investment and the development of clean energy infrastructure. By providing a clear market signal about the importance of emission reductions, carbon taxes can direct investment to green projects and increase the competitiveness of the renewable energy sector. Carbon taxes can also encourage investment in sustainable projects by providing economic incentives for emissions reductions, encouraging the use of clean energy sources, and generating revenue that can be reinvested into the development of sustainable technologies and green infrastructure (Soekarno et al., 2024).

The implementation of a carbon tax has the potential to create a more structured carbon market, where companies can buy and sell carbon credits that represent the right to emit a certain amount of carbon dioxide. This mechanism incentivizes companies to reduce carbon emissions and supports global efforts to combat climate change (H. Wang et al., 2024).. The carbon market not only helps reduce carbon footprints more efficiently, but also creates new business opportunities in the carbon trading sector. In addition, this policy has a ripple effect in the industrial sector, encouraging companies to develop energy efficiency technologies and adjust their business models to be more sustainable. Companies that previously relied on fossil energy are now starting to invest in green energy research and development (R&D), such as energy storage technology and hydrogen fuel, to improve their competitiveness in a low-carbon economy. The effectiveness of a carbon tax is influenced by the level of tax, industry readiness, and supporting policies such as green energy subsidies. In addition, economic and infrastructure differences in each country affect its success, so policies must be tailored to domestic conditions. A comparison between China, which has strong environmental regulations, and Indonesia, which is still in the early stages, can provide deeper insights into the impact on green investment and tax revenue.

According to the World Energy Investment 2024 report by the International Energy Agency (IEA), global investment in clean energy continues to increase significantly. By 2023, total clean energy investment is expected to reach around US\$1.7 trillion, reflecting a global commitment to the transition towards more sustainable energy sources. China, as one of the leaders in clean energy investment, has allocated substantial funds for the development of low-carbon technologies, including renewable energy such as solar and wind power. In addition, strong government support through increased green credit issuance, establishment of a green stock index, development of investment products, issuance of green bonds, operation of a green development fund, improvement of carbon finance instruments, creation of a green insurance system, and promotion of international cooperation in green finance have accelerated the growth of the green energy sector in the country (Wenting & Dawei, 2024). Meanwhile, Indonesia has also shown increasing commitment to the sector, albeit on a smaller scale of investment than China.

The Indonesian government has taken various steps to attract green investment, such as implementing a carbon tax and developing a domestic carbon market. In addition, policies such as multisectoral collaboration, promoting renewable energy, improving community adaptive capacity



and raising public awareness are also being implemented to achieve sustainable economic growth and climate resilience (Putri & Putra, 2024). While challenges remain, such as high dependence on coal and underdeveloped green energy infrastructure, these measures are expected to drive investment growth in clean energy projects and accelerate the transition to a low-carbon economy. With continued policy support, Indonesia has the potential to become one of the key markets for green energy investors in Southeast Asia in the coming years.

A comparison between China and Indonesia in terms of clean energy investment shows notable differences, especially in the scale and speed of implementation. China has implemented extensive industrial energy efficiency programs and policies that contribute to reducing CO₂ emissions intensity. In addition, the Chinese government has aggressively encouraged investment in renewable energy through generous subsidies, tax incentives and easy licensing for green energy projects. This policy support has enabled rapid growth in the solar, wind and electric vehicle sectors, making China a global leader in the energy transition. In contrast, green investment in Indonesia still faces various barriers, including technological limitations, inflexible energy price controls, and the absence of a comprehensive energy saving strategy, resulting in high CO₂ emissions intensity (Rock, 2012).. Indonesia's dependence on coal as the main energy source is also a major challenge in the transition to clean energy. In addition, unsupportive policies, weak links between planning and procurement, insufficient procurement volumes, unattractive prices, non-transparent processes, non-transparent land acquisition, unbalanced risk allocation, and project financing constraints are also recognized as constraining factors in this sector (Halimatussadiah et al., 2024).

Although the government has adopted a carbon tax policy, its implementation still faces obstacles such as the relatively low carbon price and the low awareness of industry players on the urgency of decarbonization. However, a more effective carbon tax, renewable energy infrastructure development, and increased international cooperation in green energy financing could potentially improve Indonesia's competitiveness in attracting green investments in the future. If these measures are implemented consistently and supported by more conducive regulations, Indonesia can accelerate its energy transition and increase its attractiveness to global investors in the green energy sector. With increased government commitment and support from various stakeholders, Indonesia has the opportunity to become a major player in clean energy investment in the Southeast Asian region along with more ambitious renewable energy mix targets in the coming decades.

A carbon tax in Indonesia signals that carbon emissions have a financial impact, encourages investment in renewable technologies, improves energy efficiency, and reduces dependence on fossil fuels. In addition, a carbon tax can be a source of revenue for the government to support environmental sustainability projects and renewable energy development (Adyana, 2023).. The implementation of a carbon tax policy and the redirection of fiscal incentives from the fossil energy sector to sustainable energy in Indonesia is expected to accelerate the transition. One of the main benefits of the shift towards a green economy is the creation of new environmentally friendly jobs, maintaining economic resilience to fossil energy price fluctuations (Rita et al., 2025). The increase in renewable energy companies in China is supported by several factors, namely increasing renewable energy investment, green credit policies from the government and financial institutions, the entry of more capital into the green industry to promote green economic growth ((He et al., 2019)

The renewable energy sector in Indonesia is showing promising growth, marked by major IPOs such as Pertamina Geothermal Energy (PGEO). Policy support and innovation in green energy financing also accelerate the development of this sector (Bursa Efek Indonesia, 2023).



China is becoming a global leader in renewable energy with massive expansion in solar and wind power capacity. As a leader in solar panel and battery manufacturing, China is lowering global clean energy costs, helping the energy transition in many countries. Large-scale projects and rooftop solar programs also encourage community participation. These strategic investments since the early 2000s, support from government policies, and dominance in the clean energy supply chain (Hilton, 2024).. Carbon taxes can be an opportunity for companies to enhance their image as environmentally-conscious entities, increase consumer loyalty and align sustainability values. Therefore, companies can be better prepared for this regulation by recognizing carbon tax as a liability in their financial statements that must be paid and recorded as an expense that can reduce company profits (Widianti Aptasari et al., 2024).

In the context of taxation, the corporate tax rate applicable in a country can affect the company's business strategy including in adjusting the tax burden with the implementation of environmental policies. The current corporate tax rate in China is 25% for both domestically and internationally funded companies, making China more competitive compared to other large countries that often apply varying rates (Kong et al., 2008) The impact of this 25% tax rate makes companies operating in the country have to set aside a portion of their profits to fulfill tax obligations. Meanwhile, in Indonesia, the corporate tax rate is set at 22%, which is slightly lower than that of China.

This difference in rates may affect the competitiveness of companies in allocating resources for green energy investments and carbon tax impact mitigation strategies. With a lower corporate tax rate in Indonesia, there is an opportunity for companies to be more flexible in allocating funds to support the sustainable energy transition without significantly sacrificing profitability. In addition, lower tax rates in Indonesia may encourage foreign investment, especially in the renewable energy sector which requires substantial funding for infrastructure and technology. In the face of carbon tax policies, companies in Indonesia have the opportunity to allocate a portion of their tax savings to investments in low-carbon technologies, energy efficiency and other green innovations. This can help companies not only in meeting environmental regulations but also in improving long-term competitiveness amid the global trend towards a green economy. Indonesia can learn from China's strategy of balancing tax burdens and green incentives to accelerate the adoption of renewable energy. With the right policies, a competitive corporate tax rate can be a tool to attract green investment and drive innovation in the sustainable energy sector, in line with emission reduction targets and sustainability-based economic development.

Tabel 2. Potential State Revenue from Renewable Energy in Indonesia and China

Year	Production EBT Indonesia	Production EBT Cina	Total Revenue Indonesia (Rp)	Total Revenue Cina (Rp)	Indonesia's Tax Revenue Potential (Rp)	China's Tax Revenue Potential (Rp)
2014	8.417	414.651	12.273.876.794.880	489.346.310.752.992	2.700.252.894.874	122.336.577.688.248
2015	8.574	479.103	12.502.818.063.360	565.408.706.407.776	2.750.619.973.939	141.352.176.601.944
2016	9.064	541.016	13.217.348.136.960	638.474.726.115.072	2.907.816.590.131	159.618.681.528.768
2017	9.459	620.856	13.793.346.869.760	732.697.119.044.352	3.034.536.311.347	183.174.279.761.088
2018	9.805	695.463	14.297.892.595.200	820.743.838.348.896	3.145.536.370.944	205.185.959.587.224
2019	10.300	758.870	15.019.713.792.000	895.572.987.503.040	3.304.337.034.240	223.893.246.875.760



2020	10.507	896.412	15.321.566.292.480	1.057.891.829.791.100	3.370.744.584.346	264.472.957.447.776
2021	11.537	1.017.852	16.823.537.671.680	1.201.208.054.707.580	3.701.178.287.770	300.302.013.676.896
2022	12.603	1.156.126	18.378.005.137.920	1.364.390.759.616.190	4.043.161.130.342	341.097.689.904.048
2023	13.113	1.453.701	19.121.699.704.320	1.715.570.977.250.590	4.206.773.934.950	428.892.744.312.648
Total Tax Revenue Potential					33.164.957.112.883	2.370.326.327.384.400
Average tax Revenue Potential					3.316.495.711.288	237.032.632.738.440

Source: Data processed by the author (2025)

Based on the table above, it can be seen that renewable energy production has increased every year, with the biggest increase in 2021-2023. This increase occurs along with the strengthening of issues related to climate change which requires countries to transform to the use of environmentally friendly energy. In addition, this increase is due to the carbon tax and carbon trading policies, this encourages green investment for renewable energy development and is evidenced by an increase in production capacity. In addition to this, it also encourages additional tax revenue from the renewable industry sector, it can be seen that the average additional tax revenue in Indonesia is 3.3 trillion and China is 237 trillion from the renewable energy sector. The significant difference in revenue is due to differences in economic structure, energy consumption and energy policy. In China's economic structure as a global manufacturing producer compared to Indonesia, which is still based on natural resources, with large energy needs in manufacturing making China expand heavily in renewable energy to reduce the implementation of carbon trading, while Indonesia still has to rely on natural resources. China has a much higher per capita energy consumption than Indonesia, but is also more aggressive in transitioning to clean energy than Indonesia and finally in terms of policy, China has already implemented carbon trading policies and invested heavily in green energy. Meanwhile, Indonesia is still in the early stages with a limited carbon tax.

Indonesia's carbon tax system and China's emissions trading system (ETS) differ in mechanism, scope, and impact on green investment and state revenue. Indonesia applies a carbon tax with a rate of IDR 30 per ton of CO₂e imposed directly on high-emitting industries, while China uses an ETS that allows companies to buy and sell emission permits. The ETS system is more flexible as it incentivizes companies to reduce emissions through green technology innovation, while Indonesia's carbon tax still has limited impact due to its low tariff and narrow scope (Elsa & Utomo, 2022). In terms of green investment, China has the upper hand as its trading system encourages companies to switch to renewable energy to avoid additional costs, while Indonesia's incentives are less effective. In terms of state revenue, Indonesia's carbon tax provides direct but relatively small revenues, while China earns more through emission permit auctions and carbon trading. The success of China's ETS shows that market mechanisms are more effective in controlling emissions and increasing green investment than a flat tax system (Adisasmitho et al., 2023). Therefore, Indonesia could consider expanding the scope of its carbon tax or transitioning to an ETS to improve the effectiveness of its emissions reduction policy. With the right strategy, carbon policy can be a fiscal instrument that not only reduces emissions but also promotes sustainable economic development.

For example, several developed countries such as the United States, South Korea, New Zealand and Canada have implemented carbon taxes or Emission Trading System (ETS) to reduce



greenhouse gas emissions. In the United States, the carbon tax is imposed at USD 20 per ton and aims to encourage companies and communities to shift to more environmentally friendly economic activities. This tax is imposed on entities that use fossil fuels in an effort to control the environmental impact of carbon emissions (Editiana, 2023). Carbon taxes and green investments not only play a role in reducing emissions, but also have a positive impact on the economy by increasing state revenue, growing the renewable energy industry, creating jobs, and encouraging innovation in the clean energy sector. It also helps increase the economy's resilience to fossil energy price fluctuations. To ensure its effectiveness, it requires clear regulations, appropriate fiscal incentives, and collaboration between the government, private sector, and the community. With strategic implementation and consistent policy support, the transformation to a green economy can proceed faster, provide long-term benefits for the environment, and strengthen the national economy.

CONCLUSION

Indonesia and China both have new revenue potential from energy use transformation and carbon taxes. The potential state revenue will not be the same, this is because from the data obtained that during 2014-2023 Indonesia and China related to carbon emissions produced and the development of green investment for renewable energy are different. If the higher the carbon emissions produced by the two countries, the amount of state revenue will change, this we can see from the carbon produced that China produces carbon emissions 10 times higher than Indonesia, then state revenue in China will also be 10 times greater than Indonesia, as well as with green investment we can see the production of environmentally friendly energy in China 40 times greater than Indonesia, then state revenue in China will follow the amount of energy produced.

Tax policies in the form of tariffs in both countries affect tax revenue. The fossil industry sector is the main contributor to carbon tax, especially countries that still rely on coal and petroleum as energy sources. The implementation of carbon tax is supported by the Paris Agreement that requires the reduction of greenhouse gas emissions. Carbon tax can increase investment in environmentally friendly sectors, which can boost green economic growth and tax revenue. The level of compliance of companies in paying carbon tax and their readiness to adapt to environmental policies affect the stability of carbon tax revenue.

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