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TRANSFORMATION TOWARDS THE FUTURE SUSTAINABLE: ANALYSIS IMPLEMENTATION OF CARBON TAX IN ASEAN-5 COUNTRIES

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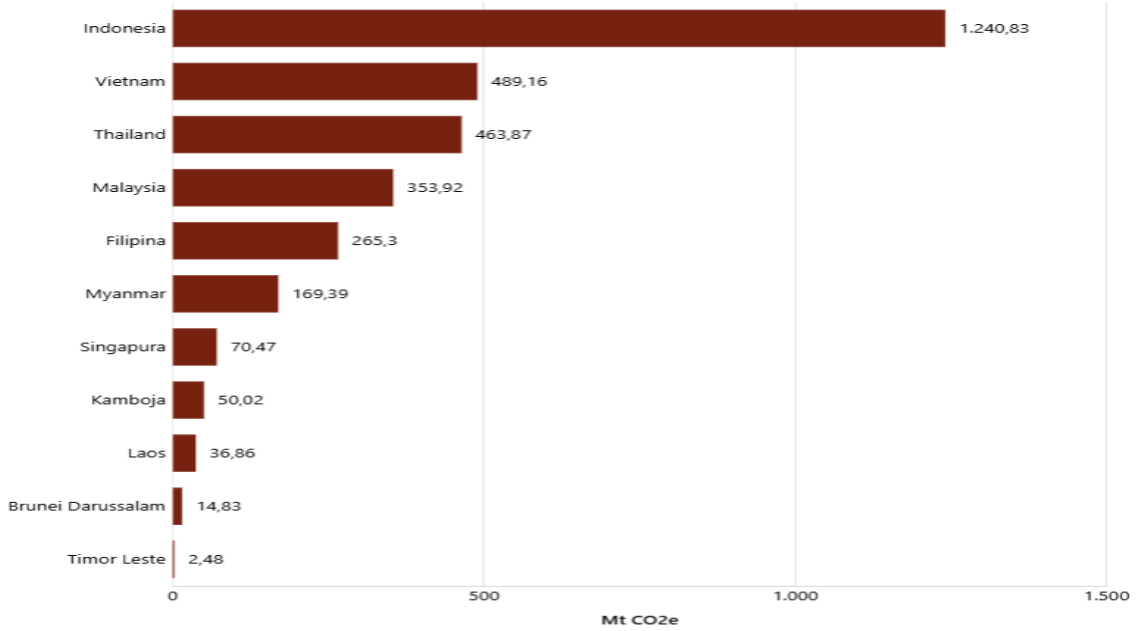
Abstract
The emission of carbon dioxide (CO_2), which has an impact on climate change, has now developed into the global problems that impact the whole world and human life. To handle this problem, ASEAN-5, which consists of Indonesia, Malaysia, Singapore, Thailand, and the Philippines, participated in an effort to reduce donation emissions of global carbon through the initiation of tax carbon. Research Objectives This is to describe how ASEAN-5 countries respond, prepare, and make policies for implementing a carbon tax. The initiative to tax carbon in ASEAN-5 is expected to push the transformation of the economy toward sustainability and provide benefits to the economy through efficient energy and innovative technology. Using a scoping review method for various journals and articles research, the study analyzes the approach taken by each ASEAN-5 country in facing the challenge of implementing tax carbon. Study results. This concludes that the only ASEAN-5 country that has applied carbon tax is Singapore, which is still in the preparation and planning stage. Many factors have become inhibitors in implementing the carbon tax in ASEAN-5 countries. A country's dependence on material burn fossils is one of the main factors. Although so, many' green ' efforts have already been implemented by ASEAN-5 countries to help reduce global emissions. This study focuses on factors, inhibitors, and potential benefits to the economy from policy tax on ASEAN-5 carbon, mainly through improved efficiency energy and the development of energy-expected renewables that can push the transformation of the economy to sustainability.
Keywords: ASEAN, Carbon Tax, Sustainability

INTRODUCTION

Climate change caused by emissions of carbon dioxide (CO2) is a global issue that is becoming of attention because of its direct impact on the world. To overcome the problem of climate and carbon emissions, The Paris Agreement in 2015 was adopted by 196 countries where targets were set that limit global warming below two °C and limit increase in temperatures up to 1.5°C (Ma et al., 2022). One of the proposed approaches to overcome the problem is the implementation of a carbon tax, which aims to internalize external costs from the emission of carbon and push transformation to an economy of low carbon (X. Zhang, 2022). Carbon tax acts as an incentive for industry to frame subtraction emissions; some studies find that tax carbon impacts, in a way, significant in subtraction emissions. Research conducted at the level of international related tax carbon and degradation emission conducted in Singapore by Tseng (2022) and Gugler et al. (2023) studied the United Kingdom, and research states that it declined emission carbon by 40% in 2005 in Sweden (Andersson, 2019). In addition to impacting subtraction emissions and minimizing climate change, taxes on carbon also have a positive influence and run One direction from the emission of carbon to GDP (Noor & Saputra, 2020).

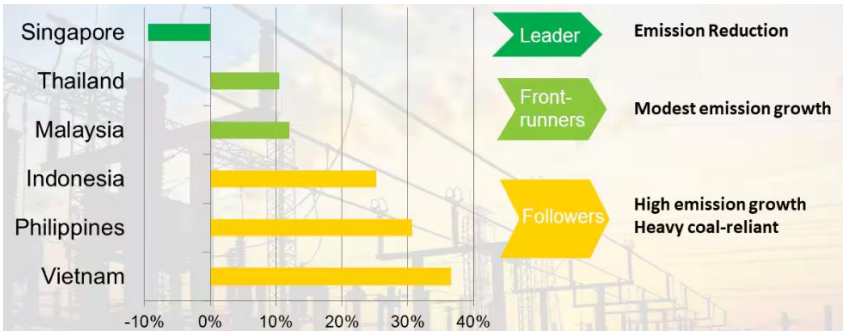
Figure 1. Carbon emissions in ASEAN in 2022



Source: databoks.katadata.co.id (2023)

Figure 1 describes the level of carbon generated by ASEAN countries in 2022. The top 5 countries that have become contributors to carbon is Indonesia in the ranking. The first rank is Indonesia, Vietnam at the second rank, followed by Thailand, Malaysia and the Philippines in the ranking fifth. If done clustering, then 4 out of 5 countries become contributor emissions the biggest member from ASEAN-5, namely Indonesia, Thailand, Malaysia and the Philippines, with added by the occupying Singaporean state seventh rank contributor emissions in ASEAN countries. If calculated, the contribution emissions of ASEAN-5 countries to other ASEAN countries are 76% or amounting to 2394.39 MT CO2e from the total ASEAN emissions of 3157.13. Conditions This is also in line with GDP levels in ASEAN-5 countries, based on data obtained from the ASEAN Statistics Yearbook 2022, delivered that ASEAN-5 occupies a high GDP level compared to other ASEAN countries. said that the ASEAN-5 GDP per capita level has a significant influence on the emission of carbon, so ASEAN-5 countries need to focus on reduction strategy emissions to reach a growth and sustainable economy. ASEAN-5 countries face various challenges and opportunities when applying tax carbon. ASEAN-5 countries are experiencing a dilemma between a developed economy and a sustainable environment Because a sufficient economy is rapid and resource-dependent Power nature (Daniele, 2011). As an overview, in Indonesia, the implementation of a carbon tax is considered an important step toward achieving emission targets in the Paris Agreement, which is to reduce emissions by 29% in 2030 (B. A. Pratama et al., 2022). However, when applying tax carbon in a country, fair and efficient policies increase awareness among the public about the importance of reducing carbon (Fu et al., 2023; Indarto & Ani, 2023). Focus study moment This discusses the related impact of the carbon tax on the environment and economy. In a study conducted by Zhang K. (2023) and Zhao (2023), it was shown that the implementation of tax carbon could reduce CO2 emissions substantially, with models showing that subtraction emission reached 22 per cent. In addition, taxes on carbon can also give benefit the economy through the improved efficiency of energy and the development of clean technology, which can create field Work that can push the sustainable growth economy (Geroe, 2019; Wang et al., 2016).

Figure 2. Growth/Reduction in Emissions from the Electricity Sector 2019 vs 2023



Source: spglobal.com (2022)

In the implementation of tax carbon, the impact generated by the distribution of tax carbon needs to be taken into consideration. The carbon tax can have an impact that affects the group earning less heavily than the group earning more heavily (Carlson et al., 2000; Grainger & Kolstad, 2010; Haites, 2018). There are costs incurred in implementing the tax carbon because tax carbon is achieved in an increasingly clean environment and reduces damage for future generations (Metcalf, 2019). Based on information in Figure 2, it is conveyed that from 2019 to 2023, addition and subtraction of carbon occurred in several ASEAN countries, which describe ASEAN-5 conditions except Vietnam; from the picture the seen that Singapore is the leader of these countries with subtraction emissions of 10%. Countries with modest emission growth are growth emission tinsel in the middle level are Thailand and Malaysia, then enter the high emission growth level occupied by Indonesia, the Philippines, and Vietnam. There are Lots study about tax carbon with object ASEAN research, but studies with the focused object on ASEAN-5 countries are still limited, so researchers interested in studying tax carbon in ASEAN-5 where ASEAN-5 produces contribution emission the highest in ASEAN and in line with The GDP generated in ASEAN-5 is also high. With the background behind this, the research aims to conduct a scoping review to see the implementation of tax carbon in each ASEAN-5 country, with a focus on response, preparedness and policy in the implementation of tax carbon. Research This expectation can give outlook-related factors inhibitors and potential benefits to the economy from policy tax carbon in ASEAN-5 countries, in particular through improvement efficiency energy and development energy expected renewable can push the transformation of the economy to sustainability.

LITERATURE REVIEW

Climate Change

According to the Indonesian UN (2023) in Oktora Putri & Susilawaty Hutapea (2024) it states that climate change is a change in term length that occurs in the pattern of weather and temperature, where activity man causes matter, especially those caused by Because burning material burn fossil such as coal, oil and gas as well release of gases such as carbon dioxide (CO2), nitrogen oxide (N2O), methane (CH4), and other substances other to atmosphere, which can increase temperature earth. Many factors cause climate change, including natural processes in the atmosphere until the biosphere, which are called internal factors. In contrast, external factors are caused by the influence produced by the activity of creature life, specifically humans. Climate change can impact human activities. Climate change can have an impact on human activities, both impacts that are felt directly and indirectly (Oktora Putri & Susilawaty Hutapea, 2024) .Changes in climate that cause are incredibly influential to water quality and quantity and can cause plague disease. United Nations Framework Convention (UUNFCCC) states that adaptation to climate change is an effort to find and do ways to change the climate, such as

adapting resilience to food, health, water, ecosystems, and independent energy. Temporarily, participating countries of the United Nations Framework Convention (UNFCCC) have the obligation to organize and implement national emission policies to mitigate climate change and reduce carbon emissions from human activities (Oktora Putri & Susilawaty Hutapea, 2024).

Carbon Pricing

The determination of carbon pricing is done using a method of setting external costs from greenhouse gas emissions (GHG) and linking it with carbon dioxide (CO_2), which is presented (Rose & Mann, 2024). Aldy & Stavins (2012) conveyed that carbon pricing is the best scheme that can be used to reduce carbon emissions. In line with the Rio Declaration on Environment and Development issued by the United Nations Conference on Environment and Development in 1992, the imposition of a price on carbon emissions is stated in Article 16 that need to be given imposition; emerging environment from emission carbon is the party that produces emissions/pollutants with to form A policy Government. The principle of carbon pricing in the declaration Rio is called the "polluter pays principle", which means that several costs must be paid by the party that produces emissions. In line with the principle, the magnitude of the cost of preventing pollution and improving the environment is the same as the costs that polluters must pay (Safitra & Hanifah, 2021). Carbon pricing schemes are used internationally, namely the Emission Trading System or the Cap-and-trade system and carbon tax (The World Bank, 2024). In developing countries, 5 (five) common carbon pricing schemes are implemented, namely the Cap-and-trade system, carbon tax, Emission reduction credit system, clean energy standard, and Eliminating fossil fuel subsidies (Aldy & Stavins, 2012). Aldy and Stavins (2012) stated that the instrument has effectively reduced carbon emissions. This proven carbon emission successfully pressed on the generator United States electricity uses the cap and trade system scheme.

The first scheme in carbon pricing is the Cap-and-Trade System, which gives a policy about limiting permissible emissions for every company; if a company produces emissions exceeding the specified limit so, the company must buy part of emissions from other companies that have not used them. Credit is the difference in emission or part emissions that a company has not used. With this condition, there is a market for buying and selling carbon that has not been used, which is called a carbon market (The World Bank, 2024). The second mechanism is tax carbon, the most accessible scheme implemented by the Government (Metcalf, 2007). The government is only able to apply rates tax for every emission of carbon produced (Aldy & Stavins, 2012). A carbon tax is a scheme for reduce emissions, the most efficient carbon tax implemented and highly recommended by economists (Lin & Li, 2011). The third mechanism is an Emission reduction credit system that is almost the same as the Cap-and-Trade scheme. The difference is that the scheme gives certificates to companies that produce carbon emissions below the established limit(Aldy & Stavins, 2012). Certificate or carbon credit is rated as an asset that can be for sale or stored and used in the future (Bagaskara, 2024). The fourth mechanism is the Clean Energy Standard, Where the government prepares standard-related criteria using technology in the best environment used by companies (Aldy & Stavins, 2012). The final mechanism is eliminating fossil fuel subsidies, where subsidies on material fossil fuels must stop because subsidies on material fossil fuels will increase consumption, resulting in improvements in greenhouse gas emissions. An International Energy Agency report (2010) shows that there are at least ten countries that provide a 5 per cent subsidy of their country's GDP, and by 2020, it is estimated that the consumption of material fossils globally will reach US$660 billion. The community will start changing their consumption decisions and switch to a materials-friendly grill environment. The material burns fossils if there is a policy deletion subsidy (Aldy & Stavins, 2012).

Carbon Tax

Carbon tax is the imposition of taxes paid on using carbon-based materials, including coal, processed oil, and natural gas (Green, 2008), and various Community activities, especially in the industry and transportation sector (B. A. Pratama et al., 2022). Carbon tax is made into a tool for evaluating potential carbon and can also help reduce emissions. The carbon tax is charged to companies or individuals that produce emissions aiming to reduce emissions and switch to using energy-clean and friendly environments (Indarto & Ani, 2023). In addition, tax carbon can also be a stimulus for development innovation in energy, energy new renewable and energy renewable national new (Callan et al., 2009), and another implication is that tax carbon can increase a country's income (Tol, 2007). Ulph & Ulph (1994) and Z. Zhang et al.(2017) conveyed that the cost of production using material fossils and coal can increase with tax carbon. The implementation of tax carbon energy, new and updated, can compete with energy fossils and materials burned based on carbon (Hájek et al., 2019; Marron & Toder, 2014).

Understanding other tax carbon conveyed by Nordhaus (2012), where tax carbon is made into a tool. To internalize the cost environment from carbon emission to the price of material burning fossil fuels, we must push for more energy clean and reduce greenhouse gas emissions through glass. Mankiw (2015) defines tax carbon as tax emissions imposed on material burned fossil with count amount of carbon dioxide produced. Nordhaus (2007) describes taxing carbon as a way to integrate the consequences of climate change on the economy and decision-making, investment, and business. A carbon tax is required in the country to reach a sustainable development economy. To keep the environment still clean, the concept of development says that Generation Now must own a minimal economy to create a prosperous economy themselves (Alper, 2018).

METHODS

The method used in this study is a scoping review, which focuses on studies related to the implementation of carbon taxes in ASEAN-5 countries. A scoping review is a method used to identify comprehensive and in-depth literature relevant to the research topic so that a deep understanding of the research topic is obtained (Arksey & O'Malley, 2005). The data collection technique used in this study was to conduct a systematic literature search through various sources, including electronic databases, scientific journals, and research reports.

The first stage of the scoping review is to develop specific research questions related to implementing carbon taxes in the world. The next step is to determine the countries raised in the study. In this study, the researcher is interested in studying countries in ASEAN-5 for information ASEAN-5 are the first countries the first ASEAN founder marked with signing Bangkok Declaration in Thailand in 1967 consisting of Indonesia, Singapore, Malaysia, the Philippines, and Thailand (Ditjen PPI, 2024). The researcher determined the relevant keywords, namely "carbon tax", in each ASEAN-5 country. To ensure the scope of the research was comprehensive, a search was conducted on several Publish or Perish applications related to carbon tax research in ASEAN-5 countries. Articles that did not meet the criteria, had full-text availability, or had been discussed by peers would not be included (Levac et al., 2010).

From the search results, further selection will be carried out by reading the article carefully and thoroughly and then deciding which research will be included in the research that is considered relevant to the research objectives and in accordance with the specified criteria. The next important step is to analyze the extracted data to find important patterns and themes, and then the results are classified.

Describe and present a broad range of relevant literature on implementing a carbon tax in ASEAN-5 countries, using various sources of similar research articles. The study results are expected to help the government and practitioners better understand the implementation of

carbon tax in several ASEAN-5 countries so that they can be used as evaluation and reference materials. The scoping review will form a standard writing format containing an introduction, literature evaluation, research methodology, results and discussion, and conclusions.

RESULTS AND DISCUSSION

Implementation of Carbon Tax in Indonesia

Based on information obtained from mediakeuangan.kemenkeu.go.id, until now the discussion of the Draft Government Regulation (RPP) related to carbon tax is still ongoing. The process of implementing a carbon tax in Indonesia began in 2021 when the development of carbon trading mechanisms was carried out; from 2022 to 2024, a mechanism was implemented using the cap and tax method for the electricity generation sector (R. A. Pratama, 2024). According to Matheus et al (2023), many inhibiting factors caused the implementation of carbon tax to be postponed until 2025, including ambiguity about How tax carbon will implemented in Indonesia, which includes procedure, collection, and use of tax funds carbon; determination rates effective tax with meaning too high a rate low No capable give sufficient incentives for perpetrator business For reduce emission carbon them, and the rates too much tax tall can give burden tough economy for sector economy small depending on the material burn fossils; and the existence of limitations source power and capacity Because the implementation of carbon tax requires source adequate power and capacity from government, good in matter administration, monitoring, enforcement law, and education to perpetrator business and society.

The Indonesian Government is quite severe in its strategy to reduce carbon emission contributions according to the previously set target to achieve net zero emissions by 2050 (Republik Indonesia, 2016). One way that can be used to achieve net zero emissions is to implement a Pigouvian tax. This tax ensures that decision-makers properly consider social costs arising from negative externalization (Mankiw, 2015). Pigouvian tax is imposed on goods that have the potential to affect environmental quality negatively (Bakker, 2009). Pigouvian tax in Indonesia is proposed for the carbon tax, where the Government has begun to prepare and regulate the carbon tax in the Law on Harmonization of Government Regulations (UU HPP). Article 13, paragraph (5) of the HPP Law states that a carbon tax is owed on purchasing goods containing carbon or activities that produce a certain amount of carbon in a certain period (Republik Indonesia, 2021). Meanwhile, the carbon tax rate is regulated in Article 13 paragraph (8) and (9) of the HPP Law, where the carbon tax rate is set higher or equal to the carbon market price in the carbon market per kilogram of carbon dioxide equivalent (CO_2e), and if the carbon price in the carbon market is lower than IDR 30 per kilogram of carbon dioxide equivalent (CO_2e), the carbon tax rate is set at a minimum of IDR 30 per kilogram of carbon dioxide equivalent (CO_2e) or equivalent unit (Republik Indonesia, 2021).

In 2022, the Indonesian Government will prepare the Fiscal Macroeconomic Policy Framework (KEM PPKF), which contains two schemes for carbon tax policies. First, the Government will collect carbon tax in stages by existing tax provisions through excise, Income Tax (PPh), Value Added Tax (PPN), Luxury Goods Sales Tax (PPnBM), and Non-Tax State Revenue (PNBP) at the central level and collection at the regional level such as motor vehicle tax and motor vehicle fuel tax. The second scheme is to form a new instrument with its own carbon tax policy in Indonesia. However, this instrument will later become a revision of Law (UU) Number 6 of 1983 concerning General Provisions and Tax Procedures (UU KUP) (Putri & Saputra, 2022).

The President of the Republic of Indonesia officially launched the Indonesian Carbon Exchange (IDXCarbon) (Jia & Lin, 2020). As a Carbon Exchange organizer, IDXCarbon provides a transparent, orderly, fair and effective trading system by OJK Regulation (POJK)

Number 14 of 2023 concerning Carbon Trading Through Carbon Exchanges (Baranzini et al., 2000). Trading IDXCarbon offers convenient transactions and transparent pricing. Currently, IDXCarbon owns four trade mechanisms: auction, trading official, trade negotiations, and markets (Callan et al., 2009). IDXCarbon is owned by the Ministry of Environment and Forestry (KLHK) and connected with the System National Registry of Control Climate Change (SRN-PPI). This policy makes administering carbon unit transfer easier and avoids double calculation (Metcalf, 2007, 2019). The perpetrator business is responsible and committed to its efforts. Good individuals who want to contribute to reducing greenhouse gas emissions glass can become users of service IDXCarbon and purchase available carbon units (Hájek et al., 2019). In addition, the company can fill in the registration form for the user for service IDXCarbon at www.idxcarbon.co.id. In addition, the owner project moment has carbon units registered in the SRN-PPI to sell carbon units through IDXCarbon (Al-Abdullah, 1999).

Carbon Tax Implementation in Singapore

Singapore's Prime Minister highlighted the importance of the price of carbon in push change behaviour; this was conveyed at the Singapore International Energy Week in 2010. The Singapore government is still considering the impact that arises of the determination of the price of carbon on the social economy, especially For Power industrial and export competitiveness, through implementation. This vital use drives R&D in efficient energy (NCCS, 2012). In July 2015, the Singapore Government, through the UNFCCC (United Nations Framework Convention on Climate Change), submitted the INDC or Plan Action Climate Voluntary. Singapore stated that in 2030, it would reduce intensity emissions by 36% of the 2005 level and stabilize emissions by 2030. With strong quantitative support, Singapore was able to move forward with weighing the benefits and uncertainties of a carbon tax as outlined in its climate action plan released at the 2016 World Cities Summit (Tippett, 2006). Finally, after observing the evolution of carbon tax policies implemented worldwide, in February 2017, Singapore announced a carbon tax of S$10 to S$20 per tonne of GHG emissions on power plants and other large direct emitters, which will come into effect in 2019. Singapore is the first ASEAN country to implement a carbon tax.

As a small country, Singapore contributes 0.11% of global GHG emissions. Therefore, the Singapore Government is committed to contributing to efforts to reduce global GHG emissions. Since 2009, Singapore has begun implementing an emission reduction strategy, which has paid off by reducing emissions by 7-11% in 2020 (Li & Su, 2017). Implementing a vehicle quota system and fuel excise duty is Singapore's strategy to control vehicle emissions; oil in electricity generation has been replaced by natural gas, which covers more than 95% of fuel. So, the carbon intensity of electricity generation has reached an almost impossible level to reduce further in the short term (Ang & Su, 2016). The efforts made by Singapore to reduce emissions are based on awareness of Singapore's unique economic conditions. In contrast, a country on a small island with limited land does not have physical resources, and export opportunities are fewer than in other countries. Singapore's leading exporters are large energy consumers, including machinery and transportation equipment; chemical materials and products; mineral fuels, lubricants and related materials; and other manufactured goods (Su et al., 2017). During 2013-2015, more than 92% of Singapore's annual total domestic exports fell into these four categories.

The carbon tax rate is set at SGD$5/tCO2e from 2019 to 2023, then it is planned to be increased in 2024 to 2025 to SGD$25/tCO2e, then during 2026 to 2027 it is set at SGD$45/tCO2e, and is planned to reach a tax rate of SGD$50–80/tCO2e in 2030. Any facility that produces emissions of 25,000 tCO2e or more annually is subject to the carbon tax, while facilities that produce emissions of at least 2,000 tCO2e are designated as facilities that must be reported. The tax covers the spectrum of GHGs, including CO2, CH4, N2O, HFCs, PFCs,

and SF6. However, GHGs from minor emission sources unrelated to primary production activities and NF3 are exempt from tax. GHG emissions associated with transport fuels are charged to Customs and Excise. Singapore's carbon tax is regulated by Singapore's Carbon Pricing Act 2018 (CPA 2018) and ISO 14064–1:2018, both focusing on measuring and reporting greenhouse gas (GHG) emissions. However, there are some critical differences between the two frameworks, namely that Singapore's Carbon Pricing Act 2018 focuses specifically on direct emissions, including CO2, CH4, N2O, SF6, HFCs and PFCs from fuel combustion and industrial processes and product uses (IPPUs). The Act includes some exceptions, such as emissions from certain biofuels and biomass combustion and diesel with a sulphur content of more than ten ppm. In contrast, ISO 14064 covers all three areas of direct and indirect energy and other indirect emissions in its guidelines.

Implementation in Malaysia

In 2016, it was reported through World Bank data that the amount of CO2 emissions in Malaysia was 248,289 kilotons or an increase of 60,000 kilotons from 2006 (World Bank Group, 2024b), and an increase of 200,000 kilotons from 1960. This condition explains that there has been a very rapid increase in Malaysia's CO2 emissions in line with increased development, where this condition also contributes to global emissions (SINO et al., 2020). The most significant contributors to Malaysia's GHG include electricity (30.5%), transportation (14.5%), solid waste (10.8%), oil and gas industry (10.2%), and manufacturing and construction (8%)(SINO et al., 2020). At the UN Climate Change Conference in Copenhagen, Denmark (COP15) in December 2019, Malaysia committed to reducing carbon emissions to GDP by 40% by 2020 compared to 2005. In line with this commitment, Malaysia has given the slogan of low-carbon cities to several local governments to form a low-carbon society and increase the involvement of all stakeholders in supporting GHG emission reductions. Before the conference, Malaysia had implemented a 'green' initiative in the country's development agenda through the 3rd Malaysia Plan (RMK3), RMK10, RMK11, and RMK 12 (PwC Malaysia, 2021). At the beginning of RMK3 in 1976-1980, Malaysia began to pay attention to the impact of industry on society and the environment, and then RMK10 (2010-2015) focused on energy consumption. In RMK10, the development of energy supply was planned through diversification of energy sources, including exploration of renewable energy and nuclear energy as alternatives; this policy is expected to increase energy efficiency initiatives across sectors. RMK11 (2016-2020) focuses on green lifestyle, growth, and learning according to the concept of sustainability; this RMK is directed to have minimal impact on the environment and nature conservation; the formation of policy determination, regulations and division of responsibilities; and increasing community assessment. RMK12 (2021-2025) continues the green initiative by emphasizing the environmental sustainability dimension in the blue economy, green technology, renewable energy, climate change adaptation and mitigation.

Based on information obtained from DDTC News, Malaysia will only implement a carbon tax in 2026, which will be imposed directly on three sectors: iron, steel and energy (Kurniati, 2024). The Minister of Investment, Trade and Industry of Malaysia conveyed through DDTC News that the carbon tax policy plan still requires further study and that there is a need to pay attention to the readiness of the business world. In Malaysia, there is a written law that regulates various integrated actions to manage the environment and control all activities that produce pollution called the Environmental Quality Act 1974. However, until now, Malaysia still prioritizes providing tax incentives rather than fines in the form of taxes; for example, in 2014, Malaysia introduced two green tax incentives. The first green tax incentive is the Green Investment Tax Allowance (GITA), and the incentive tax second is the Green Income Tax Exemption (GITE); the second scheme Contains allowances and exemptions tax on industries that contribute to a friendly environment (Zainol Ariffin et al., 2024).

Carbon Tax Implementation in the Philippines

The Philippines is a very vulnerable country in the Asia-Pacific region. to risk climate, where the average annual temperature is projected to increase in 2020 and 2050 (Rose & Mann, 2024). The problem of the climate in Asia-Pacific is the challenges of the Philippine Crisis, such as increasing activity of typhoons and rising sea levels (World Bank Group, 2024a) or problem resilience food. In 2045, it is projected that the surface sea will increase by 30 cm, and with increasing activity, typhoons will occur in the Philippines (Cabalu et al., 2015). The Philippines is a country that participated in the ratification convention on climate change required to report household gas inventory glass nationally as determined by the IPCC (Seriño, 2016a). It was reported from the household gas inventory that in 1994, the Philippines released 100,738 KTCO2 into the atmosphere from sector energy, industry, agriculture, and absorption of clean GHG from change use land and sector forestry (Seriño, 2016b). Increase request material burn increasing fossils since 2010, improving carbon emission by 72% between 1992 and 1998 (Corong, 2011). It is estimated that upgrade emissions will continue because the use of material burn fossils will grow by 62 per cent between 2003 and 2012, as reported by PEP 2003 in Serino (2016a).

The government of the Philippines has participated in various related multilateral agreements in the environment (Corong, 2011). In 1991, the Philippines formed The Inter-Agency Committee on Climate Change in 1992, responding to Earth Summit's commitment to form the Climate Change Council (Cabalu et al., 2015). In 2003, the Philippines ratified the Kyoto Protocol, establishing the Presidential Task Force on Climate Change Adaptation and Mitigation and the Advisory Council on Climate Change (Cabalu et al., 2015). Culminating in 2009, the Philippines passed the Climate Change Act 2009, Republic Act No. 9729 of 2009, where change climate was postponed in law regarding the National Framework Strategy on Climate Change and change programs climate as well as formed Committee Climate Change (Republic of Philipines, 2024). It does not continue beyond there; according to Cabalu et al. (2015), the Philippines formed the National Climate Change Action Plan 2011-2028.

Plan carbon tax implementation in the Philippines will be held in 2025 (Qibthiyyah et al., 2023). Carbon tax supported by information provided by Eco-Business (2024), Philippines, to validate Invite The so-called Investment Law with The Philippines's Low Carbon Economy Investment Act 2022. This act aims to mobilize investment in a climate-focused private sector, mandating harmonious decarbonization with the Paris Agreement of companies and forming a long-term climate back plan.

Carbon Tax Implementation in Thailand

Thailand is one of the countries with economy-intensive energy growth rapidly in Southeast Asia (Chhay & Limmeechokchai, 2019). In line with the conditions mentioned, it is known that Thailand consumes enormous amounts of energy and releases several significant GHG emissions, especially in the energy sector (Chaichaloempreecha et al., 2019). According to statistics from EPPO (2018), sector Thailand energy contributed 254.4 million tonnes of CO2 emissions in 2015, most of which consisted of emissions from sector generator electricity (38%), industry (30%) and transportation (24%). In 2015, the electricity consumption in Thailand was 185,572 GWh, an increase of 3.6% compared to the previous year. Consumption of electricity per capita in 2015 reached 2,621 kWh/capita. Regarding electricity generation, the Authority Power Generation of Thailand (EGAT) in 2015 provided 38.07% of total consumption energy, while 61.93% was produced from manufacturing electricity and electricity imported from neighbouring countries (EGAT, 2015). In response to requests to increase electricity drastically, the Ministry of Energy and the Authority of Power Generation of Thailand (EGAT) prepared Plan Thailand Electric Power Development 2012-2036 to determine the development scheme of power electricity (Energy Policy and Planning Office,

2015). Thailand still uses conventional electrical energy sources, where emissions from sector electricity can result in the degradation of social and environmental and improvement of Greenhouse Gas (GHG) emissions worldwide (Chhay & Limmeechokchai, 2019)

As a developing country, Thailand is highly vulnerable to the impact of climate change. In the 21st Conference of the Parties (COP21), countries agreed to minimize their emissions based on the Paris Agreement, the so-called Nationally Determined Contribution (INDC). Thailand submitted its INDC and related information to the Convention Framework Work Union Nations about Climate Change (UNFCCC) in 2015, committed to reducing greenhouse gas emissions glass by 20% by 2030. Rising by 59% from 220.7 million tons of CO2 (MtCO2) equivalent in 2000 to 350.7 MtCO2 equivalent in 2012, In the past decade greenhouse gas (GHG) emissions in Thailand have increased dramatically (Saelim, 2019). Carbon tax on fossil fuels burn fossil can give incentive to switch to energy cleaner, more renewable, and sustainable terms (Kerr, 2016; Kossoy et al., 2015).

(Kusumadewi, Winyuchakrit, & Limmeechokchai, 2017) studied GHG mitigation in the electricity sector and analyzed potential energy sources for mapping Thailand's NDC roadmap by 2030. They give several scenarios using the Planning model Long Term Energy Alternatives (LEAP). Research results show that Thailand has the potential to reduce GHG emissions using renewable energy and achieve Thailand's NDC target by 2030 (Kusumadewi, Winyuchakrit, Misila, et al., 2017)). Misilia et al. (2017) used the LEAP model to classify future GHG mitigation from sector energy to achieve the INDC targets. So, the INDC plan can lower GHG emissions by 27% in the energy sector. To achieve INDC targets, one of the plans must reach at least 75% of the target, and others must reach target (Misila et al., 2017). Although not yet, there is yet to be any information about when Thailand will implement tax carbon. To realize its commitment to the Paris Agreement, Thailand should implement some strategies to support the subtraction of emissions. Thailand provides incentive tax for Companies that register themselves on a reduction program emission the so-called volunteer with the Thailand Voluntary Emission Reduction Program (T-VER) launched by the organization Home Gas Management Glass (TGO) (Kurniati, 2022).

CONCLUSION

The ASEAN-5 countries have committed to reducing greenhouse gas emissions and limiting increases in global temperature below two degrees celsius, as marked by the Paris Agreement 2016. Indonesia is committed to reducing emissions by 29% in 2030; Malaysia will reduce emissions by 45% by 2030; Singapore is committed to reducing emissions by 36% by 2030; Thailand is committed to 2030 reduce emissions by 20% and commitment to decreasing greenhouse gas emissions glass in 2030 will be 75 % conducted by the Philippines. Based on research, taxing carbon is a practical scheme for reducing carbon. Of the ASEAN-5, only Singapore applied tax carbon in 2019, while other countries are Still in the stage of preparation, exploration, study and development plans. Several thing factors cause this situation. The main reason for not implementing tax carbon is the need for more readiness in the countries in question, like Indonesia, which has already validated tax carbon in Invite Invite HPP in 2021 and launched it in 2022 but postponed it to 2025. The World Bank reported that the retreat in implementing tax carbon in Indonesia is due to Indonesia's dependence on material burn fossils. Although tax carbon has not yet been applied to some of the largest ASEAN-5 countries, each country has already implemented many other strategies and policies to reduce GHG emissions.

This study has several necessary limitations in terms of results from research; data limitations and references become the main limitations; with the use of the scoping review method, the researcher fully depends on journals and published articles that may not cover all policy' latest related implementation tax carbon in ASEAN-5 countries. With limitations, this

can limit understanding deep reader analysis of each country's readiness to apply tax carbon. The following limitation is the use of the scoping review method, which is descriptive, so it does not give an analysis of the quantitative impact of the economy and environment on policy. Therefore, it is recommended that further quantitative and exploratory policy combinations be studied to understand better the comprehensive effectiveness of implementing tax carbon in ASEAN-5 countries.

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