A Proposed Carbon Tax Framework for Malaysia and the Challenges of Implementation in the COVID-19 Economic Recovery Plan

Izlawanie Muhammad♣

Faculty of Economics and Muamalat, Universiti Sains Islam Malaysia, Nilai, Negeri Sembilan, Malaysia

ABSTRACT

The years 2020 and 2021 were challenging years for many governments worldwide due to the COVID-19 pandemic. In the aftermath of the global health crisis, the International Monetary Fund strongly recommended that governments in developing countries should not only focus on economic recovery but also ensure environmental sustainability. In response to this suggestion, the Malaysian government announced the introduction of a carbon tax in the 12th Malaysian Plan (2021-2025). However, there was little information on the policy, and the government had not announced the framework. The proposed policy also raised the question of how it would be implemented under the COVID-19 economic recovery plan. This study aimed to propose a framework for implementing the Malaysian carbon tax and explore possible obstacles for the government in implementing the policy. A qualitative research methodology was used, involving document analysis and in-depth interviews. Based on the analysis, a Malaysian carbon tax framework consisting of 10 main components was constructed. In implementing the policy, the government needs strategies to overcome various challenges, including lack of expertise and public resistance. In addition to enhancing the Malaysian carbon tax literature, the findings of this study will serve as a solid foundation for the government to implement a feasible and acceptable carbon tax policy.

Keywords: Developing Countries, Carbon Tax, COVID-19 Economic Recovery Plan, Environmental Tax, Public Policy

♣ Corresponding Author: Izlawanie Muhammad; Faculty of Economics and Muamalat, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia; Email: izlawanie@usim.edu.my; Tel: 067986437

INTRODUCTION

The COVID-19 pandemic had severely affected the global economy and financial markets. Significant income losses, a rise in unemployment, and disruptions in the transport, services, and manufacturing sectors were among the consequences of the pandemic. The pandemic significantly affected middle-income countries as poverty rates increased (Gnangnon, 2021), and developing countries may be home to 82% of the new poor[1] (World Bank, 2021a). Malaysia had also experienced similar financial and economic crises.

Apart from the substantial spending on healthcare, the Malaysian government had allocated RM250 billion for the *Prihatin Rakyat* Economic Stimulus Package (PRIHATIN), food security programme, cash assistance to the public, and subsidies, incentives and loans for small and medium enterprises (Ministry of Finance, 2020). The government released a RM35 billion National Economic Recovery Plan (PENJANA) in June 2020 and in September 2020, it announced the PRIHATIN Supplementary Initiative Package (KITA PRIHATIN) totalling RM10 billion to further ease the burden on businesses and keep them afloat (Ministry of Finance, 2021).

However, the COVID-19 economic recovery plan in Malaysia and developing countries should not only focus on fiscal and financial aspects but must also include a green economy approach to generate revenue while protecting the environment. Developing countries have accounted for about 39-47% of the world's greenhouse gas (GHG) emissions, leading to an increase in global air temperature, upper oceanic warming, pollution, and depletion of resources such as air, water, and soil (Wei et al., 2016). These adverse consequences of GHG emissions are a global problem, not just for the place where the emissions occur. The impact of GHG emissions would be severe in developing countries due to the positive relationship between poverty rates and carbon emissions. Using a cross-sectional regression analysis of 98 countries, Nabi et al. (2020) found that the greater the poverty, the higher the carbon emissions, which could slow economic growth.

Carbon tax has become a popular method of environmental protection in both developed and developing countries to mitigate carbon emissions and generate revenue. A carbon tax is a market-based instrument that imposes certain costs on polluters to minimise or eliminate environmental externalities. The strategy targets the main cause of climate change, namely fossil fuel use, which has higher social costs than private or market-based costs (Metcalf, 2019). Placing a price on carbon emissions encourages individuals, businesses, and industries to reduce their carbon footprint and transition to cleaner and more sustainable energy sources. Haites (2018) analysed the impact of carbon tax on carbon reduction and found that carbon taxes in

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[1] The new poor refers to people who are more urban than the chronic poor, more engaged in informal services and manufacturing, live in congested urban settings, and work in sectors most affected by lockdowns and mobility restrictions (World Bank, 2021a)

European countries led to carbon dioxide (CO_2) reductions of up to 6.5% over several years. Although the policy often faces public opposition, it has been implemented in 33 countries and jurisdictions, including South Africa, Colombia, and Finland (World Bank, 2021a).

The potential for negative economic impacts, such as a decline in overall economic performance or gross domestic product (GDP) and social welfare, is one of the factors behind public opposition to introducing carbon taxes (Douenne & Fabre, 2020; Savin et al., 2020). A large number of studies have contrasted carbon taxes and the Emissions Trading Scheme (ETS), another market-based carbon pricing scheme. According to research, both approaches have proven effective in reducing carbon emissions and raising revenues (Goulder & Schein, 2013; Haites, 2018). The outcomes of each system would differ significantly if design elements such as income recycling systems were changed. Notwithstanding public opposition, the main arguments favouring carbon taxes over ETS are price stability and low administrative burden (Metcalf, 2019; PMR, 2017).

Muhammad's (2022) analysis of 16 carbon tax guidelines, based on the experiences of countries that have implemented the policies, showed that policy design is a lengthy process before it can be fully implemented to achieve its benefits, namely reducing carbon emissions and increasing government revenues. The latter is particularly important for developing countries like Malaysia. Increased government revenues are needed for various purposes, from paying government debt to increased spending on education and health. Ireland is an example of how the carbon tax has successfully supported the government's economic recovery plan. In 2010, introducing the carbon tax, essentially passed in 2007, was expedited as a tool for the government's revenue-raising measures. Between 2010 and 2012, carbon tax revenues contributed between 21.5% and 24.6% to Ireland's €64 billion debt incurred as a result of the 2008 global financial crisis (Convery et al., 2014). A similar economic recovery plan to deliver environmental and economic benefits could be designed and implemented based on Malaysia's economic position, prospects, and carbon emissions.

OVERVIEW OF MALAYSIAN ECONOMICS AND CARBON POLICY

Malaysia's Economic Position and Prospects

As a middle-income developing country with an open economy, Malaysia has successfully diversified its economy from agriculture and the commodity-based sector to a robust manufacturing and services sector since its independence in 1957. The main sources of revenue for the Federal Government are direct and indirect taxes. More than 50% of the government's revenue comes from direct taxes, with corporate income tax (CIT) being the largest contributor. In 2018, total revenue amounted to RM232.8 billion, representing a 16.1% share of GDP. The following year, total revenue increased by 13.5% to RM264.4 billion, mainly due to a RM60 billion increase in capital gains (Ministry of Finance, 2019, 2020).

As the Malaysian economy grew and its financial deficit steadily declined, the country's stability was suddenly hit by the COVID-19 pandemic. As in many other countries around the world, the COVID-19 crisis posed greater challenges to public financial management and increased fiscal risk, such as a protracted economic downturn, a prolonged pandemic, and lower crude oil prices. The COVID-19 pandemic has also led to a sharp decline in corporate revenues. In 2020, Malaysia collected only RM59 billion in CIT (2019: RM63.7 billion). Tax revenues from individuals were also lower in 2020, which declined by 4% to RM35.9 billion compared to RM38 billion in 2019. The most significant decline was recorded for petroleum income tax (PIT), which fell by 58.9%, related to the lower estimated average crude oil price of US$40 per barrel and lower demand. Other direct tax revenues, including stamp duty and real property gains tax, were lower at RM8.2 billion following COVID-19 economic stimulus packages (Ministry of Finance, 2019, 2020).

Malaysia's revenues were lower compared to peers and neighbouring countries, including Thailand, the Czech Republic, the Philippines, Singapore, and Indonesia[2] (IMF, 2023). Low tax revenues would hinder the promotion of inclusive growth. In addition, Malaysia had been running a negative fiscal deficit since the 1980s. This profligacy was the main reason for the macroeconomic imbalance, especially during the 1981-1986 national financial crisis, the 1997-1998 Asian financial crisis, and the global financial crisis between 2007 and 2008 (Ministry of Finance, 2019). The fiscal deficit was mainly financed by external and domestic borrowing from commercial banks and the Central Bank. After the global financial crisis, the government had managed to achieve good revenue performance and gradually reduced the percentage of GDP deficit share in 2019 (Ministry of Finance, 2020).

Due to the COVID-19 crisis, tax revenues had fallen, while higher spending on health care and to stimulate the economy through counter-cyclical measures were necessary. This had increased debt levels, which disrupted the medium-term fiscal consolidation path. The pandemic had also increased the percentage of GDP deficit share in 2020 to -6.0%, and the deficit is expected to decline even more in the following years (Ministry of Finance, 2020). In its economic recovery plan, the Government used the 6Rs approach, namely Resolve, Resilient, Restart, Recovery, Revitalise, and Reform, to prevent long-term structural damage (Ministry of Finance, 2021). Without feasible implementation of the carbon tax in the COVID-19 economic recovery plan, the Federal Government's deficit would grow, unemployment would remain significant, and external debt would remain high.

Malaysia's Carbon Emissions

Malaysia is one of the highest CO_2 emitting countries in the ASEAN region, after Indonesia and Thailand, with 255 million tonnes of CO_2 in 2019 (Ritchie & Roser,

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[2] In 2022, the estimated total revenue for Malaysia, Thailand, the Czech Republic, the Philippines, Singapore, and Indonesia amounted to USD313.69 billion, USD432.63 billion, USD273.41 billion, USD374.97 billion, USD328.51 billion and USD1,100.29 billion, respectively (IMF, 2023).

2020). Together with 23 other developing countries, CO_2 emissions accounted for 46% of global GHG emissions (World Bank, 2021b). Table 1 shows that Malaysia's carbon emissions in 2019 were 330,358.21 Gg CO_2 without land use, land use change, and forestry (LULUCF) and 115,643.68 Gg CO_2 with LULUCF (Ministry of Natural Resources, Environment and Climate Change, 2022).

Table 1: Malaysia's Greenhouse Gas Emissions in 2019

Sector	Emissions/ Removals (Gg CO_2 eq.)
Energy	259,326.11
Industrial processes and product use	32,853.80
AFOLU – Agriculture	9,921.71
AFOLU – LULUCF	-214,714.54
Waste	28,256.59
Total (excluding LULUCF)	330,358.21
Total (including LULUCF)	115,643.68

Source: Ministry of Natural Resources, Environment and Climate Change (2022)

The energy sector was the primary source of carbon emissions, with 259,326.11 Gg CO_2 eq., an increase of 27.95% compared to 2005. Within this sector, emissions from the energy industries represented the largest sub-category, accounting for 50.80% (131,735.68 Gg CO_2 eq.) of the total energy sector. Malaysia highly depends on fossil fuels to meet commercial energy needs and continue economic growth until the nation becomes a developed country (Latif et al., 2021). Emissions from the transport sector were recorded as the second highest sub-category accounting for 25.05% (64,973.10 Gg CO_2 eq.) of the total emissions from the energy sector. The manufacturing and construction sub-category contributed to the third highest emissions or 12.95% of the total energy sector emissions (33,578.18 Gg CO_2 eq.).

Malaysia has been advised to adopt carbon pricing policies to meet its commitments under the Kyoto Protocol (signed in 1997 and implemented in 2005) and the 2015 Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC)[3] (Al-Amin et al., 2015; Babatunde et al., 2018; Yahoo & Othman, 2015). In line with these agreements, Malaysia aimeds to voluntarily reduce its CO_2-equivalent GHG emission intensity of GDP by up to 40% based on 2005 levels by 2020 and a 45% reduction (compared to 2005 levels) by 2030 (UNFCCC, 2015). However, as GHG emissions currently have no price, there is little incentive for producers and consumers to find ways to reduce their carbon footprint.

The current tax incentives for investing in green technologies to improve environmental protection appear to be unsustainable and failing (Hasnu & Muhammad, 2022). This can be evidenced by the Environmental Performance Index

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[3] The Kyoto Protocol introduced a market-based approach for the reduction and control of GHG. The 2015 Paris Agreement broadened the set of tools that address carbon emissions and climate change such as green financing and trading in green bonds as well as regulatory and fiscal instruments (UNFCCC, 2015).

(EPI). Malaysia's scores fell from 59.22 (2018) to 47.9 (2020), indicating a decline in Malaysia's performance in air quality, water and sanitation, climate protection, and energy (EPI, 2020). Polluters in Malaysia are not investing as the government pays for expensive emission abatement and society bears the cost of the remaining pollution. If this continues, carbon emissions may increase, leading to pollution, depletion of resources (e.g., air, water, and soil), destruction of ecosystems and habitats, and extinction of wildlife. Pollution and resource depletion are particularly harmful to human health, industrialisation, and development, which are crucial for economic growth.

A Proposal for Carbon Pricing in Malaysia

In 2021, the Malaysian government approved the Ministry of Environment and Water's proposal to develop voluntary ETS and Domestic Emission Trading Systems (DETS). This policy was implemented primarily due to two important factors: pressure to meet the Intended Nationally Determined Contribution (INDC) pledge and the adoption of the European Union's Carbon Border Adjustment Mechanism (CBAM). Under the CBAM, Malaysian exporters can suffer trade losses worth more than €24 billion from European countries if they do not produce more GHG-efficient goods. Although the ETS policy is still at an early stage of development and membership is voluntary, it provides a platform for Malaysian companies to reduce carbon emissions and remain competitive in European trade markets. Bursa Malaysia, Malaysia's stock exchange, is the pioneer of the DETS and has announced that it aims to become carbon neutral by 2022.

In 2021, the Malaysian Prime Minister strongly announced a carbon tax under the 12th Malaysian Plan (2021-2025). A fixed charge will be levied on the carbon content of fossil fuels, forcing energy and fuel providers to increase their costs. Econometric research showed that a carbon tax in Malaysia would reduce carbon emissions as companies would likely adopt green technologies to replace high-cost conventional technologies (Al-Amin et al., 2015). Carbon abatement would be more effective than energy taxes, while renewable energy would be enhanced substantially (Solaymani, 2017; Yahoo & Othman, 2015).

In a recent study, Al-Amin et al. (2020) posited that Malaysia, Indonesia, and Thailand will experience significant emission reductions after 2030 if they implement their INDC targets as agreed in the 2015 Paris Agreement. Specifically, Malaysia, Indonesia, and Thailand will reduce their total emissions by 33.88%, 42.50%, and 41.68% respectively by 2050. Hasnu and Muhammad (2022) suggested that the Malaysian government learn from the top three countries in the 2020 EPI, i.e., Denmark, Switzerland, and France, in implementing a carbon tax policy. Apart from these countries, Malaysia should also gather information from developing countries that have successfully implemented these policies. Developing countries share common underlying problems, such as a lack of resources and social inequity, for which tax policy design may be more complicated than in developed countries (Muhammad, 2022).

Experience with Carbon Tax in Developing Nations: Lessons Malaysia Should Learn

The carbon tax has attracted the attention of developing countries. Of the 33 countries and jurisdictions that have implemented a carbon tax, six are developing countries, namely Mexico, Colombia, Chile, Argentina, Ukraine, and South Africa (World Bank, 2021b). Indonesia was due to introduce a carbon tax in April 2022 but was postponed due to the ongoing conflict in Ukraine (Mapa, 2022). Thailand and Vietnam have expressed interest in introducing carbon pricing, similar to Malaysia. The governments of these countries are seeking to develop the most appropriate policies to meet their commitments under the Paris Agreement.

Countries that implemented the carbon tax have taxed different industries at different rates. For example, Chile's carbon tax only applies to the electrical industry. In Mexico, all industries are subject to the carbon tax except natural gas, the main fossil fuel used there. In Colombia, only the petrochemical and refining industries are subject to the carbon tax on natural gas. The rates for the initial implementation of the programme in these countries were low: US\$3.21/tCO$_2$ in Mexico and US\$5/tCO$_2$ in Chile and Colombia (Narassimhan et al., 2018). Indonesia plans to start its carbon tax at only US\$2.1 per tonne of carbon (Mapa, 2022). According to researchers, the low rate may not be sufficient to substantially impact the ecosystem (Cottrell et al., 2016). However, to ensure that carbon taxes can be increased in the future without facing significant political resistance, it is important to levy them at a low rate while having a variety of tax rates (UN, 2017).

Although no published report or study confirms that the policy has successfully reduced carbon emissions, statistics have proven that the policy increased government revenues even during the COVID-19 pandemic. For example, Chile, Mexico, and South Africa collected US\$165 million, US\$230 million, and US\$43 million in carbon taxes in 2020 (World Bank, 2021b). In Mexico, the revenues went directly into the general treasury, which the government spent in several sectors (PMR, 2017). Studies suggest that the funds should be politically allocated so that the government can openly declare that they are used for environmental projects, even if the revenues go into the general budget (Cottrell et al., 2016; UN, 2017).

Malaysia should learn from the countries that have implemented carbon tax. The information can be used to create and implement a carbon tax framework specific to the nation's particular socioeconomic and environmental conditions. However, the government has not announced the framework for implementing a carbon tax. Little is known about the governing body, the tax base, and how the revenue will be spent. The proposed policy also raises the question of how it will be implemented as Malaysia seeks to recover from the COVID-19 downturn. Therefore, the government should seriously consider the features of carbon taxes and review the policies used in other developing countries to develop an effective and acceptable carbon pricing policy. This study aimed to propose a framework for the implementation of the carbon tax in Malaysia. The framework will explain the components that the government should decide on in designing a feasible, acceptable, and effective policy. This study also explored the government's challenges in designing and implementing the policy.

RESEARCH METHODOLOGY

A qualitative research methodology was used, employing the methods of document analysis and in-depth interviews. The former method was conducted on published papers, guidelines, reviews, and frameworks on the carbon tax to understand the implementation strategies and challenges for developing countries. Documents were gathered from online resources, including websites, journal databases, and search engines. Only publications on carbon tax implementation and experiences in developing countries were collected. In addition, the researcher also collected research publications on carbon tax implementation in Malaysia. A total of 160 papers were selected for the eligibility process. The collected papers were manually reviewed by the author during the eligibility process to ensure that they were relevant to the carbon tax implementation framework in developing countries. This approach involved reading the titles, abstracts, research methods, and results of the publications. In the end, only 58 articles were selected after a total of 102 papers were removed. The data was analysed using content analysis technique, which categorised main themes and sub-themes.

Having established a general framework for Malaysia based on secondary data, the next step was to seek the views of experts through in-depth interviews. Invitation letters were sent to 15 tax, environment, and energy experts selected from the ministries of finance, environment, and energy. Despite numerous invitation attempts (including phone calls and emails), many individuals did not express interest in participating in this study. Only three accepted the invitation, as shown in Table 2. The lack of response could be due to the fact that carbon tax in Malaysia is still in its infancy and few people are aware of its concept and importance. Baker & Edwards's (2012) review study on qualitative interviews concluded that a specific number of respondents is not required for the research. Rather, the number depended heavily on the research questions and the practical issues that arise during the research project. Since document analysis was the primary source of data, the three interviewees were sufficient to achieve the research objectives.

Table 2: List of Interviewees

Interviewee	Expertise	Position and Organisation
1	Environmental expert	Head of Division, Ministry of Environment and Water
2	Tax expert	Professor, Universiti Sains Islam Malaysia
3	Energy expert	Head of Division, Suruhanjaya Tenaga

The researcher asked open-ended questions (see Appendix 1), asking interviewees for their views on the implementation of the carbon tax in Malaysia, plausible challenges, and suggestions for best practices. Further questions were asked for clarification and detailed information. The interviews were conducted in October 2021. Each interview was conducted in the Malay language via video call (Microsoft Teams and Zoom) and lasted between 30 and 45 minutes. Prior to the interviews, they

were informed that the interviews would be audiotaped, and their personal details would not be disclosed.

Audiotaping each interview improved the accuracy of data transcription and interpretation and ensured the validity and reliability of the data. This process enabled the researcher to transcribe each interview faithfully and accurately. The tone of voice used by the interviewees as well as the emphasis of different phrases during the interviews helped the researcher identify sensitive data and provided greater insight into the process of accurately interpreting the data. The audiotapes could also be replayed at a later stage of the analysis if clarification was needed on a particular topic (Stringer, 1996).

The interviewees also signed an informed consent form, agreeing that some of their responses reflected personal views and did not represent the organisations they worked for. After the interview, tokens of appreciation were sent to the interviewees' offices. The interview was transcribed in Microsoft Word, with interviewees coded as R1, R2, and R3, respectively. The transcribed data was also analysed using the content analysis technique, similar to the secondary data.

RESULTS

A Proposed Carbon Tax Implementation Framework for Malaysia

Based on the experience of countries with carbon taxes, Muhammad (2022) outlined 10 components of the carbon tax framework that policymakers should consider when designing policy. The 10 components are objective, subsidy reform, administration, tax base, tax rate, use of revenue, coordination with other tax and environmental policy, preserving business competitiveness, evaluation, review and adjustment, and information dissemination. With reference to the components proposed by Muhammad (2022) and the experts' recommendations, a proposed carbon tax implementation framework for Malaysia is presented in Table 3. Explanations for each component are presented in the following table.

Table 3: Carbon Tax Implementation Framework in Malaysia

	Components	Suggestions for Malaysia
1	Objective	Domestic revenue mobilisation
2	Subsidy reform	Reform fuel subsidy
3	Administration	Principal: Ministry of Finance, Royal Malaysian Customs Department
		Counterpart: Ministry of Environment and Water, Ministry of Energy and Resources, and the Ministry of Science, Technology, and Innovation
4	Tax base	• Fossil fuels accounted for 73% of CO_2 emissions from the electricity and transport sectors
		• Upstream approach at the mine mouth
5	Tax rate	• RM35 per tonne of CO_2
		• The increase in tax rate is determined using the periodic review approach at 5-year intervals

6	Use of revenue	• General budget
		• Revenue-neutrality: cash refunds to low-income households and tax reliefs for solar panel installation in residential areas
7	Coordination with other tax and environmental policy	Coordination with the Environmental Quality Act, 1974 and Sustainable Energy Development Authority Act 2011
8	Preserve company competitiveness	• Assist job relocation
		• Support businesses to adapt to changing business environment
		• Re-evaluate existing tax incentives and subsidies in green technology policies by increasing the tax allowance and broadening the investment scope
9	Evaluation, review, and adjustment	Monitoring, reporting, and verification systems
10	Information dissemination	Education and information campaigns, holding workshops and consultations, providing training, supporting research, and including environmental education in school syllabus

Source: Authors' Collection

Objective

The first component in designing a carbon tax in Malaysia is to set the objective. The main objective of a carbon tax is to reduce carbon emissions. However, governments may also have complementary goals, particularly revenue generation. The United Nations (2017) asserted that the objective of carbon taxes in developing countries should be to mobilise domestic revenues, not to transition to a green or revenue-neutral tax, which has been a primary justification for industrialised nations in the past. Carbon taxes should raise government revenues for additional developing country expenditures, such as debt reduction, necessary infrastructure investments, and environmental or social goals. The infrastructure needed for sustainable development and the shift to a green economy must be financed in developing countries, where more public revenue is needed. Moreover, it will take years for Malaysia to recover from the pandemic's economic and social consequences and return to sustainable economic activity. While the initial objective of Malaysia's carbon tax is to reduce emissions, after significant spending on public health, national defence, and COVID-19 stimulus packages, the taxes collected should be allocated to domestic revenues.

Subsidy Reform

The second component is the reform of Malaysia's fuel and electricity subsidy programme, which has existed since 1983. In 2011, more than 10% of the government's operating expenditure was spent on fuel subsidies, which accounted for 7.2% of GDP, higher than the global average of 2.7% (Clements et al., 2013; Ilias et al., 2012). In 2019, following the increase in global crude oil prices, Malaysia's operating expenditure of RM2.4 billion was mainly used for fuel subsidies (Ministry of Finance, 2019). For electricity tariff subsidy, the government spent more than RM6.5 billion in 2022 to help people with inflation (Bernama, 2022). Reducing or eliminating the subsidy would increase the government's revenue while significantly

affecting consumers' fuel and energy consumption habits. However, any proposal for subsidy reform should thoroughly assess the potential impact of the reform on energy companies and low-income groups and quantify the direct and indirect effects of the reform (UN, 2017).

Administration

In terms of administration, the Royal Malaysian Customs Department (RMCD), under the Ministry of Finance (MOF), should administer carbon tax. Although carbon tax is a tax on carbon emissions, in practice, the tax base is a product or process. Therefore, it is usually considered an indirect tax or excise tax. Therefore, the RMCD should be the governing body. Coordination with other ministries with carbon emission experts, such as the Ministry of Environment and Water, the Ministry of Energy and Resources, and the Ministry of Science, Technology and Innovation, is essential for developing carbon tax instruments and policies. A special task force headed by the Prime Minister's Department may be formed for coordination. In addition, concerned stakeholders, such as businesses, should be involved in the policymaking process to take into account their feedback and gain broad support.

Tax Base

The fourth component is the tax base. The fuel approach is the predominant method of carbon taxation worldwide (UN, 2021). It involves taxing fossil fuels, primary oil, gas, coal and their derivatives and setting the tax rate based on the carbon content of the fuel. Thus, an upstream policy could be implemented by taxing companies that extract the fuel at the mine mouth to maximise coverage while limiting collection points. Generally, a broader carbon tax is efficient for countries without a carbon pricing system (UN, 2021). Regarding the type of taxpayers, the carbon tax should be applied to Malaysia's electricity and transport sectors, which are the main contributors to CO_2 emissions. Other sectors, such as manufacturing and cement, should be exempted from the tax for at least five years, which is how long it will take for the policy to be reviewed.

Tax Rate

After the tax base has been determined, the government must determine the tax rate. It is advisable to levy a carbon tax regardless of the initial rate, as introducing it should be seen as a learning process (UN, 2021). Several approaches for determining the tax rate include standard and price, revenue targets, and benchmarking. It is recommended that Malaysia adopts the benchmarking approach with RM35 (approximately US\$8) per tonne of CO_2 as the initial rate, which is lower than the Organisation for Economic Co-operation and Development's (OECD) recommendation of €30 per tonne of CO_2. The lower rate follows the initial carbon tax rate adopted by other developing countries such as Mexico, Chile, and Indonesia, as well as Singapore, Malaysia's neighbour. The low initial rate is a crucial strategy to gain public support. In addition, low initial rates can serve as price signals, as the tax rate can later be adjusted to a level consistent with environmental goals. Yahoo and Othman (2015) estimated that Malaysia would achieve a 40% reduction in carbon emissions by introducing a carbon tax rate of US\$60-70 per tonne of CO2.

Use of Revenue

The sixth and one of the most critical components of the framework is the determination of the use of revenue. Although increasing government revenue is not the primary objective of a carbon tax, experience shows that many countries have successfully raised revenue while reducing carbon emissions. In Malaysia, Al-Amin et al. (2015) projected that carbon tax revenues of RM9,535 billion could be raised if the policy was implemented from 2010 to 2105. Loganathan et al. (2014) argued that while carbon taxes would enable Malaysia to sustain its economic growth, they would not reduce the environmental hazards caused by the high volume of industrial activities. However, the study did not take into account the potential use of new green technologies, other natural resources with lower carbon emissions, and government-implemented environmental policies, all of which are essential components of national development plans and environmental policies.

Similar to many countries such as Ireland, Chile, and Mexico, the revenue from the carbon tax should be directly allocated to the general budget to achieve the policy objective. The Malaysian government could use the money to pay off debt or spend in various sectors. A revenue-neutral approach can be adopted to gain public acceptance by compensating low-income households through existing cash-refund systems such as "Bantuan Sara Hidup" and "Bantuan Prihatin Rakyat". However, this approach should be carefully considered to avoid spending more than was actually collected and potentially limiting public awareness. An allocation to fund green technology development should be made from carbon tax revenues after the policy has demonstrated its effectiveness in reducing carbon emissions and when the government has increased its revenues. Earmarking is important to slow down global warming, reduce the greenhouse effect, and use less energy. Tax reliefs should also be introduced for the installation of solar panels in homes to encourage the use of renewable energy.

Coordination with other Tax and Environmental Policy

Coordination with other climate and tax policies is the seventh component of the framework. It is suggested that the Malaysian government focus on climate policy coordination, particularly the Environmental Quality Act 1974 and the Sustainable Energy Development Authority Act 2011. No significant changes to tax policies, such as the Income Tax Act 1967 and the Sales Tax (Amendment) 2022, should be made to avoid a decline in tax revenue.

Preserve Company Competitiveness

The government must take into account the distributional consequences of applying the tax and possible negative effects on business competitiveness. Although many countries have signed the Paris Agreement, adjusting the border tax in the initial phase of introducing the carbon tax is not an appropriate approach to protect business competitiveness and avoid displacement effects. It will be a more appropriate policy when Malaysia's neighbouring countries have similar climate commitments. Reducing corporate taxes should not be done in the early stages as this would reduce much-needed government revenue. Instead, the Malaysian government should assist

with job relocations and help companies adapt to the changing business environment. To encourage more businesses to invest in green technologies, the Sustainable Energy Development Authority can re-evaluate the existing tax incentives and subsidies for green technologies by increasing the tax allowance and expanding the scope of investment.

Evaluation, Review and Adjustment

The ninth component is evaluation, review, and adjustment. As suggested by many policymakers, monitoring, reporting and verification systems should be in place to understand the reliability of carbon pricing policies in achieving environmental goals and to provide emissions data to verify compliance and assess cost-effectiveness. This information will help the government adjust its carbon tax over time for a variety of reasons, including complexity, shifting goals, economic volatility, and public support. The Malaysian government may need help and support from countries that are successfully implementing carbon pricing. Vietnam, for example, received assistance from European climate policy experts for its environmental tax reform (Rodi et al., 2012; Muhammad, 2022). Malaysians should be sent to countries with extensive carbon tax experience to learn and gain knowledge to become experts.

Information Dissemination

Information dissemination, the final component of the framework, is critical to raise awareness, improve feasibility, and increase public support. This can be achieved by providing basic educational materials, social media information campaigns, developing detailed guidelines, conducting workshops and consultations, providing training, supporting research, and including environmental protection in school curricula. The main message that needs to be communicated to the public is that the main purpose of a carbon tax is to change the behaviour of households and businesses. The government also needs to transparently communicate all aspects of the plan, including how the revenue will be distributed, the distributional impacts, and how it intends to address them. For a successful and long-term carbon pricing programme, it is crucial to gain political support. Carbon taxes will face major challenges if businesses and individuals do not embrace them.

Challenges to Policy Implementation

The content analysis of the open-ended interviews with the experts revealed five main challenges in implementing a carbon tax policy. First, there is a lack of information about the policy, mainly due to the absence of carbon tax experts and coordination between ministries.

> R1: I don't think the MOF has a carbon tax expert. In fact, only six people are looking into the ETS in our office, which puts a lot of pressure on us. There is a lot of work to do, and many deadlines to meet, and more experts are needed to do this work to ensure we have a feasible policy in place.

R1: We do not receive any information on how the carbon tax will be implemented. And I believe other ministries too. A ministry will keep passing the responsibility to another ministry because they are not capable of doing it […] Coordination between ministries is vital to understanding the work scope.

R3: We don't have any information about the framework and base to charge the carbon tax […] Even I do not know who should oversee the carbon tax […], and I believe MOF does not know, just like myself […] You won't find a single agency that declares carbon tax is their responsibility because it involves various agencies and everybody seems to pass it to one another.

The second challenge is public resistance. The government has provided various subsidies, including fuel and electricity, since 1983 to reduce the financial burden on the public. Removing the subsidies and introducing a carbon tax will increase fuel and electricity bills as well as other goods and services, leading to public resistance. Nevertheless, the higher cost of living can be cushioned by cash support for low-income households.

R3: The government has been giving a lot of subsidies, and our people still live in a subsidy mentality. The government provides a lot of rebates for the electricity tariff to avoid price increments. I don't think it's feasible to implement the carbon tax within these five years. People are not ready and increasing the electricity tariff is difficult.

R2: A strict pricing monitoring system must be implemented to avoid the GST (Goods and Services Tax) reversal policy experience. People are not ready to pay higher costs, what more during COVID-19 […] Money collected from carbon tax should be rolled back to society, but the government must reassess the criteria for B40. Many from M40 have moved to B40, and the government must ensure that only the right persons receive it [monetary help].

The third is the lack of readiness from business owners, which can slow down policy development. Research on business readiness is vital before policy implementation.

R1: Although many companies understand the negative impacts of carbon emissions, they may not be ready to comply with the carbon tax rule […] The exporters recognise the importance of carbon reporting to comply with the CBAM; however, it will take some time for them to adopt it.

R2: If we look at the GST, they [the government] talked about this for many years before its implementation. But, when the government

finally implemented it, the businesses seemed unprepared. They rushed to purchase the accounting systems […] We should examine the readiness of business owners before the policy is in place.

Fourth, constraints in the electricity provider system. Fossil fuels are Malaysia's main source of electricity generation and will remain so for the next 10 to 15 years.

R3: Fossil fuels have been the major source of electricity […] Renewable energy can only provide 17% of the energy supply […] Furthermore, renewable energy like solar can only be used during the day. We still need fossil fuels to supply electricity at night […] We have stopped the new development of fossil fuel plants because we are moving towards renewable energy. However, fossil fuels will still be used for the next 10 to 20 years because each plant has its projected years of supply. So, we cannot remove fossil fuels so soon. We still need to use them and do not have a backup now.

R3: TNB (Tenaga Nasional Berhad) monopolises the electricity-providing market. Although many IPs (independent providers) are in the market, all the energy must be sold to TNB. We did a lot of research and found that many providers will not guarantee a low tariff.

Fifth, unstable political conditions. The unstable political situation in Malaysia worsened in 2018 following the collapse of more than six decades of Barisan Nasional rule. A new opposition coalition party, Pakatan Harapan, became the new government and Tun Mahathir Mohamad, the fourth Prime Minister, was re-elected as the seventh Prime Minister. However, his office did not last long due to internal political instability. A new Prime Minister was elected in 2020, followed by subsequent appointments in 2021 and 2022. The new government and the other political parties were believed to be cautious about making tax policy changes or proposing manifestos in order to win votes.

R2: I think they won't be able to implement it so soon […] Next year, we might have the election, and I suppose they would have to wait until after the election before announcing the new tax policy.

R3: Our political situation is still not stable […] I think the government wants to focus on recovering from COVID-19 [economic downturn]. The policy can only be implemented if we have one Minister who stands out and fights to protect the environment. I want to see who that Minister is […] We can only enforce the policy when the political situation is stable.

DISCUSSIONS AND CONCLUSIONS

The impact of the COVID-19 pandemic on developing countries is severe, especially in countries with low incomes, limited resources, social inequity, and high government debts. International organisations such as the United Nations (UN) and the OECD have urged policymakers in developing countries, including Malaysia, to include carbon pricing in their economic recovery plans. The main objective of carbon pricing is to reduce carbon emissions. It is also the main tool in the fight against climate change and is in line with Sustainable Development Goal (SDG) 13 (Climate Action).

Many policymakers in developing countries such as South Africa, Indonesia, and Mexico have embraced carbon taxes. Malaysia's neighbour, Singapore, introduced this policy in 2019. Following Malaysia's commitment to the Paris Agreement, the government has proposed implementing a carbon tax in its 12th Malaysian Plan (2021-2025). However, the proposal was made after the COVID-19 pandemic, when the Malaysian government and many other countries struggled to rebuild nations. This has raised the question of how the government should design a carbon tax policy.

This study proposes a framework for implementing a carbon tax in Malaysia to design a feasible, acceptable, and effective policy. This study also examined the challenges faced by the government in designing and implementing the policy. A qualitative research approach was adopted to answer the research objectives by conducting document analysis and in-depth interviews with tax and energy experts. It covered the areas of objective setting, subsidy reform, administration, tax base, tax rate, use of revenue, coordination with other tax and environmental policies, preservation of company competitiveness, evaluation, review and adjustment, and information dissemination. The Malaysian government needs to make appropriate decisions on the 10 components in order to have a carbon tax policy that provides long-term investment stability, low administrative costs, and effectively achieves its objectives.

Policy implementation faces several challenges, including a lack of experts, coordination and information between ministries, public acceptance, business readiness, and unstable political conditions. To overcome these challenges, the government needs to conduct research, invest in human development, put aside different political beliefs, and seek advice from international experts. One important strategy is to coordinate carbon tax and ETS policies to prevent carbon-intensive industries from relocating to countries that do not charge carbon prices. Another practical approach is to test for at least a year before the actual introduction of the carbon tax. During this time, problems can be identified, and the government can find solutions.

The implementation of carbon tax policies must be supported by other strong fiscal, economic and public health policies, cuts in non-essential spending, and restrictions on non-essential imports. Without a comprehensive policy and socioeconomic recovery plan, Malaysia's public deficit will widen, inflation and

unemployment rates will rise, and the country's environmental problems will worsen. Implementation will also require strong public support, and the policy should be seen as a country initiative rather than a political agenda. Muhammad et al. (2022) found that the Malaysian public will support the implementation of the carbon tax if they perceive the government is accountable for its spending. The government's transparency, the public's high level of environmental awareness, and the altruistic commitment of all stakeholders could avoid the experience of the tax policy reversal in 2018 when the government lost approximately RM21 billion by abolishing the GST.

The outcomes of this study add to the limited literature on carbon tax in Malaysia. The lack of research on carbon taxes in Malaysia can be attributed to doubts about their implementation, especially when the country faces unstable political and economic conditions. If the Malaysian government is determined to implement the policy, this study will serve as a solid basis for implementing a feasible and acceptable carbon tax policy. Without prominent action, Malaysia could lose its export earnings and get a bad image from investors. Therefore, the MOF and other relevant ministries must take immediate action to design the policy, which will take at least several years before it can be fully implemented. More environmental problems could arise during this time, costing Malaysia more export revenue.

Future research should examine potential revenues, the estimated reduction of CO_2 emissions, and the potential distribution costs using an econometric model, such as the computable general equilibrium. In addition, a nationwide study of public acceptance of the carbon tax should be conducted by examining economic, political, psychological, and demographic factors, such as attitudes towards environmental protection, willingness to pay, income, and location. Understanding public acceptance behaviour will help the government understand public readiness and plan strategies to increase public support. Studies on carbon tax implementation should also be extended to other developing countries where implementation of the policy is strongly recommended.

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APPENDIX 1

Questions to Interviewees

1. What is your opinion about the government's carbon tax implementation proposal?

2. I have constructed a framework for carbon tax implementation in Malaysia using secondary data. In your opinion, what should be improved in the proposed framework?

3. What are the challenges that the government may face in implementing the policy?

4. In your opinion, what are strategies to implement a feasible carbon tax policy?