Implications of the EU's Carbon Border Adjustment Mechanism (CBAM) for ASEAN: An Argument for More Ambitious Carbon Pricing

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Executive Summary

This policy brief examines the implications for ASEAN Member States (AMS) of the European Union's Carbon Border Adjustment Mechanism (CBAM) and suggests an overall direction for responses. The EU's CBAM aims to minimize carbon leakage and the loss of the EU's trade competitiveness due to its more ambitious climate mitigation policies, particularly the end of free allowances for the Emissions Trading Scheme (ETS). The trial phase began in October 2023. Key elements of CBAM remain undecided, especially what countries need to do to avoid the adjustment. Concerns have been raised that it might significantly harm ASEAN economies' macroeconomic performance and trade competitiveness. This policy brief argues that these fears are exaggerated, since the CBAM's initial scope is limited to a few sectors which account for a very small amount of ASEAN exports to the EU. However, CBAM's scope may be expanded in the future to other EU-ETS sectors, and ASEAN's other major trading partners may adopt similar border adjustment measures, enhancing the importance of responding to them. Therefore, this paper concludes that CBAM provides a good opportunity for the AMS to strengthen their own carbon pricing, industrial decarbonization technology, and other climate mitigation measures. AMS could request the EU to enable other climate mitigation measures besides just carbon pricing to also qualify to offset the border adjustment, such as introducing more advanced industrial decarbonization technology, increasing renewable energy and energy efficiency, expanding public transportation, etc. AMS could also request the EU to simplify the reporting and compliance procedures and provide assistance for developing CBAM reporting and compliance mechanisms, and possibly AMS's own CBAM process. A review of the global research on the trade and economic impacts of carbon pricing in general suggests that they may not be very significant. Moreover, any trade competitiveness gaps will recede as more of ASEAN's major trading partners adopt higher levels of carbon pricing and their own border adjustment mechanisms. AMS concerned about effects of carbon pricing or other climate measures on trade competitiveness could consider adopting their own CBAM and other compensation measures, possibly coordinated at the regional level, such as at the EU-ASEAN regional dialogue. Joining the Climate Club launched at COP28 would enable AMS to have an early voice in developing international standards for border adjustment mechanisms.

1. Introduction

This policy brief examines the implications for ASEAN Member States (AMS) of the European Union's Carbon Border Adjustment Mechanism (CBAM) and suggests possible directions for ASEAN's response. This issue has attracted a great deal of attention in ASEAN since the EU is one of its major trading partners.

The EU's CBAM is intended to offset potential negative effects on its trade competitiveness of the phasing out of free allowances in its Emissions Trading System (EU ETS). The phase out of free allowances will increase the EU's domestic carbon price substantially, thereby increasing the ambition of the EU's climate mitigation efforts. CBAM is intended to incentivize trading partners to strengthen their own carbon pricing to similar levels, thereby preventing low carbon prices from becoming an unfair competitive advantage, and to increase the ambition of overall global decarbonisation. The trial phase began in October 2023.

The EU's CBAM has raised various concerns globally, including in ASEAN. It is the first major effort aiming to level the trade playing field in terms of carbon pricing. There are concerns that it could be a major instrument of trade protection (Lo 2024), that it might not be WTO-compatible (Durán 2023), and that it might disproportionately harm developing countries (Magacho, Espagne, and Godin 2023). Concretely, countries may be worried that CBAM might negatively affect their exports and economic competitiveness. AMS are also concerned about carbon pricing's effect on trade competitiveness. The fact that key aspects of the CBAM remain to be decided – including the scope of products to be covered, the level of the adjustment amounts and their calculation methods, detailed implementation procedures, and prospects for future expansion of the mechanism –heighten these concerns.

This policy brief explains that these concerns are exaggerated for now, since the CBAM's initial scope is limited to a few sectors and AMS exports to the EU in these sectors are not very large, but CBAM's impact is likely to increase in the future as CBAM's planned scope expands and as other countries adopt it. Some AMS have, or are considering, preliminary forms of carbon pricing. However, these measures are probably insufficient to significantly reduce potential CBAM charges.

Therefore, in responding to the EU's CBAM, it is suggested that AMS should strengthen their own carbon pricing and adopt other measures to reduce the products' carbon intensity such as more advanced industrial decarbonization technology. AMS could also request the EU to simplify the CBAM's reporting and verification mechanisms. AMS's responses could be strengthened by regional cooperation on carbon pricing and other climate mitigation measures through other ASEAN targets and frameworks such as the ASEAN Plan of Action for Energy Cooperation (APAEC), ASEAN Carbon Neutrality Strategy, and the ASEAN Taxonomies on Sustainable Finance.

To address concerns about effects of carbon pricing on trade competitiveness, AMS could adopt their own CBAM mechanisms, join international climate clubs, or adopt other compensating measures. This would also benefit from regional cooperation among AMS as well as assistance from the EU, which could be discussed at occasions such as the EU-ASEAN Energy Dialogue, the ASEAN Working Group on Climate Change, and the UNFCCC Regional Dialogues on Carbon Pricing (Re-diCAP).

This policy brief is organized as follows. Section 2 explains CBAM and its overall context, including its outstanding design questions and WTO compatibility. Section 3 discusses the possible impacts of CBAM on ASEAN. Section 4 outlines the current situation of carbon pricing in ASEAN. Section 5 examines existing global research on the macroeconomic and trade competitiveness impacts of carbon pricing. Section 6 discusses global CBAM trends. Section 7 concludes and presents suggested recommendations.

2. CBAM Basics

2.1 What Is CBAM and How Will It Work?

The EU has steadily increased its climate ambition, including substantially raising its carbon price by phasing out free allowances under its ETS from 2026-2034. The free allowances were intended to minimize carbon leakage due to the increased carbon price resulting in the loss of trade competitiveness of certain GHG-intensive industries. Therefore, to offset elimination of the free allowances, the EU adopted CBAM to bring the carbon pricing of certain GHG-intensive imports in line with its internal carbon price in order to minimize the harm to the trade competitiveness of these industries. The CBAM also aims to encourage other countries to adopt more ambitious decarbonisation and/or carbon pricing mechanisms. Initially, CBAM covers six "emissions intensive and trade exposed (EITE)" sectors: (1) iron and steel; (2) aluminium; (3) fertiliser; (4) cement; (5) electricity; and (6) hydrogen (European Union 2023).

EU importers of designated products within these sectors will have to pay a border adjustment for the embedded carbon by purchasing CBAM certificates. The certificates will be equivalent to the carbon price gap between the EU's ETS and the exporting country. CBAM includes scope 2 indirect emissions, such as the electricity used in the production of the good, and for some products, certain precursor materials used in their production (European Commission 2023a).

The pilot 'transitional' phase of CBAM is from 1 October 2023 to 31 December 2025. During this phase, importers only need to submit reports on the designated products; no payment of CBAM certificates is required until CBAM commences in full, on 1 January 2026. The information will be used to assess the system's effectiveness and inform modifications of the system and its implementation procedures. Border adjustments will not be assessed during the transitional period, but major violations of reporting requirements may be penalized. The 'transitional' period is also a good opportunity for ASEAN to discuss the CBAM's final design with the EU.[1]

At the start of the scheme, CBAM certificate costs will be relatively low because they will only apply to a small proportion of the embedded emissions. Until free allocations end entirely in 2035, CBAM will only apply to the proportion of emissions that do not receive free allowances under the EU ETS (Simões 2023). However, CBAM certificate prices will rise progressively from 2026-2035, as these allowances are gradually phased out.

2.2 Unfinished CBAM Design Elements

In the transitional phase, several key elements of CBAM remain undecided, especially:

- The methodology for calculating the GHG emissions of specific products
- The verification system
- Whether other climate mitigation policies besides carbon pricing can offset the border adjustment
- How to calculate the equivalence of foreign carbon pricing schemes to the EU ETS
- Expansion of CBAM's scope to other sectors or products

These issues are examined further below.

[1] For more detailed information see the EU's website: https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en.

Methodology for calculating GHG emissions for specific products

Calculating GHG emissions for specific products is not easy, and the EU has yet to decide which methodologies will be acceptable for specific products. Both the EU and its trading partners will need to make significant investments in capacity to conduct this analysis. There may be a major tradeoff between accuracy and procedural simplicity. Default values have been established for CBAM goods other than electricity which can be used when it is not possible to report actual emissions (European Commission 2023b). This may be especially useful for small and medium enterprises, in order to minimize transaction costs.

Verification system

The verification system is not yet established (European Union 2023). It is not clear who would be eligible to conduct verification or how the process would work, leading to concerns that it might be very cumbersome and result in delays due to an insufficient number of organizations who are certified to conduct verification.

What climate mitigation policies are eligible to offset the border adjustment

The EU's CBAM was designed to complement the EU's ETS, so the initial concept was intended to incentivize countries to adopt ETS or carbon pricing similar or equivalent to the EU. However, some EU trading partners may be using or considering other types of carbon pricing or climate mitigation policies, such as introducing more advanced industrial decarbonization technology, increasing the use of renewable energy, raising energy efficiency, phasing out coal-fired power plants, expanding public transportation, etc. Other climate mitigation policies may be just as or even more effective than equivalent carbon pricing measures in reducing GHG emissions, but their effects on carbon prices might be indirect, and they might not necessarily result in higher carbon prices, even if they effectively reduce GHG emissions. Nevertheless, since a key purpose of CBAM is to incentivize stronger climate mitigation policies, the EU should allow other types of policies to be eligible for reducing the border adjustment, not just EU-style ETS and carbon pricing. The EU has expressed its intention to consider a wider range of climate mitigation policies, but this aspect of the policy has not been decided yet. [2]

Equivalence of foreign carbon pricing

Where a carbon price has already been paid on a product in its originating jurisdiction, in principle, this amount will be deducted from the amount owed in CBAM certificates. However, the EU has yet to provide guidelines on how the "effective carbon price" or the "equivalency" of other countries' carbon pricing policies will be calculated under the CBAM. So far, the European Commission has decided that subsidies (negative carbon pricing) and rebates paid will be considered. The effective carbon price is defined as the actual price per tonne due for the installation's production processes as well as for relevant precursor materials used in the production (European Commission Directorate-General Taxation and Customs Union 2023). It is unclear whether the EU will take into consideration payments companies have made for voluntary credits, although this seems unlikely.

Possible expansion of CBAM 's scope to other sectors or products

CBAM's initial scope is limited to just six sectors, but the scope of the coverage is expected to be expanded later, based on the sectors in the EU's ETS, as the free allowances in these sectors are reduced and

[2] Based on the discussion at "EU CBAM and Its Implication for Japanese Companies" held in Tokyo on 13 November 2023, hosted by The Delegation of the European Union to Japan, The Institute of Energy Economics, Japan, and the EU-Japan Centre for Industrial Cooperation (https://www.eu-japan.eu/events/eu-cbam-carbon-border-adjustment-mechanism-and-its-implication-japanese-companies).

eventually eliminated. The EU regulation establishing CBAM aims to extend the scope to all of the sectors covered in the EU ETS (Directive 2003/87/EC) by 2030 (European Union 2023). The main priorities for future expansion may be chemicals and petrochemicals, but complex downstream products such as automobiles may be difficult to include, since CBAM is administratively very complex.[3]

These uncertainties make it difficult for AMS to design their own carbon pricing schemes or other climate mitigation policies in a way that would clearly avoid or minimise the CBAM's impacts. However, the transitional period creates an opportunity for other countries, including in ASEAN, to engage in constructive dialogue with the EU to shape CBAM's final design and implementation.

2.3 Compatibility with the WTO Framework

CBAM's compatibility with the WTO framework has been questioned from various perspectives. For example, there is some concern that CBAM might involve indirect discrimination in its current form because it only acknowledges other countries' certain explicit carbon pricing schemes. It does not recognise other forms of climate mitigation policies. Therefore, products from countries using other climate mitigation measures such as regulation instead of carbon pricing, could be discriminated against.

The EU argues that CBAM is compliant with the WTO framework, and with the phase out of domestic free allocations, domestic and international producers are both equally subject to the EU ETS carbon price. There is no differential national treatment. Similarly, CBAM applies to all international products equally, depending on their carbon price and respective domestic carbon pricing, satisfying the 'most-favoured nation' requirement of GATT. There are no exemptions for any particular country.

The EU's explanations have not necessarily persuaded sceptics. However, the EU is one of the world's largest trade blocs. Moreover, discussing this issue within the WTO framework would not be very effective since the mechanism has become deadlocked in recent years, and the dispute settlement mechanism has become inoperative. The EU has indicated that it may consider other climate mitigation measures besides carbon pricing in the future as the CBAM framework is further developed.[4] Moreover, this issue has been extensively discussed elsewhere (Leonelli 2022; Simões 2023; Robert 2022; Sejdiu 2023; Durán 2023). Therefore, this paper will not further analyse the legal aspects of CBAM's WTO compatibility.

3. Global Trend of Carbon Border Adjustments

CBAM and similar measures are likely to expand beyond the EU, including some of ASEAN's major trading partners. This will increase the pressure on ASEAN to adopt more ambitious carbon pricing or other climate mitigation measures which could offset the border adjustments.

The UK has decided to introduce CBAM from January 2027 (HM Revenue & Customs and HM Treasury 2024). Overall, it appears to be quite similar to the EU's CBAM. Both are related to planned reductions in free ETS allocations (UK's ETS and the EU's ETS). The initial covered sectors are the same as those covered by the EU – aluminium, cement, fertiliser, hydrogen, and iron and steel – except the UK's CBAM does not include electricity. The UK's CBAM will apply to direct, indirect, and selected precursor emissions in the covered sectors, also similar to the EU. Products to be considered for future inclusion may differ from the EU, as the UK has indicated that glass and ceramic products may be the next priorities.

[3] See note 2 above.
[4] See note 2 above.

Canada has begun to explore the potential of introducing a border carbon adjustment and issued a study on key issues (Department of Finance Canada 2021). Australia is undertaking an assessment of carbon leakage risks and the feasibility of an Australian Carbon Border Adjustment Mechanism (Department of Climate Change, Energy, the Environment and Water 2023).

In the US, three Republican senators introduced a border carbon adjustment bill, known as the Foreign Pollution Fee Act, in November 2023 (Cosbey 2023; Elkerbout, Kopp, and Rennert 2023). The introduction of this bill follows two prior legislative attempts to enact BCAs in the US: the US Clean Competition Act and the Fair, Affordable, Innovative, and Resilient Transition and Competition Act (FAIR Act) (Dumain 2023). While both prior attempts failed, the repeated introduction of such bills, by both Republican and Democratic senators, indicates bipartisan interest in implementing some form of BCA in the US. The Foreign Pollution Fee Act is exclusively focused upon reducing imported embodied carbon emissions in US trade flows, rather than reducing domestic industrial US emissions. Another bipartisan bill, the Prove It Act, which directs the Energy Department to study the carbon emissions intensity of imported products with comparable domestic products, passed the Senate Environment and Public Works Committee (Dumain 2024). A carbon border adjustment would be compatible with President-elect Trump's emphasis on tariffs as a core economic policy.

Japan's Ministry of Economy Trade and Industry (METI) established a committee of experts to examine the possibility of introducing a carbon border adjustment (Takezawa 2021; Nikkei 2021).

China has not announced any intention to implement CBAM, but it has announced plans to improve measurement of the carbon content of products which would serve as a precursor to such an effort, in addition to helping the country to respond to the EU's CBAM (Stanway and Liu 2024). According to the Global Times, "the National Development and Reform Commission (NDRC), State Administration for Market Regulation, and Ministry of Ecology and Environment published an action plan for the strengthening of carbon peak and carbon neutrality standards and measurement systems for this year and next year," and the plan "calls for essentially establishing a unified carbon emissions accounting and evaluation standard system targeting enterprises, projects and products by 2025, as well as the establishment of carbon emission management standardization pilot projects in 100 enterprises and industrial parks" (D. Chu 2024). China indicated an intention to respond to CBAM by accelerating the extension of its national ETS to the iron and steel sectors (Yin 2023).

Thus, China is moving quickly to introduce measures to offset the EU's CBAM, since maintaining competitiveness of its exports in EU markets is a high priority. China's actions are likely to be much faster than ASEAN's, so there is a risk that ASEAN's exports to the EU could become disadvantaged compared to China's.

4. CBAM's Estimated Impact on ASEAN Member States

The EU's CBAM has attracted considerable international attention as the first policy of this type. However, in its present state, its overall economic effects are estimated to be limited, both globally and on AMS, except for some producers in the covered sectors, due to the small number of covered sectors. CBAM's main impact will probably be upon the EU's close neighbours, especially Russia, Ukraine, and Turkey, who are the main exporters of the covered sectors to the EU (World Bank 2023; European Commission 2021).

CBAM's potential impact on a given country mainly depends on the extent of the country's exports to the EU in the CBAM sectors. The impact could be high if the total value of the country's exports to the EU in the covered sectors is high, or if the country's exports in those sectors to the EU as a percent of that

country's total exports is high. Even if the overall economic significance of a country's exports to the EU in the covered sectors is low, it is still possible that the CBAM could affect the sales and profits of specific companies. In principle, different countries could be affected quite differently by the EU's CBAM depending on their economic structure.

The initial impact on ASEAN will probably be quite limited because ASEAN's exports to the EU in the covered sectors are very small, under 100 million euros for cement, fertilizers, and hydrogen, and under 300 million euros for aluminium in 2022. Only in the case of steel did the exports rise above 1 billion euros for Vietnam and Indonesia (Table 1). Indonesia and Vietnam accounted for the largest value of exports in the 5 sectors.

Table 1: Selected ASEAN Member States' Exports to the EU in CBAM-related Sectors in 2022

Country	Aluminium	Cement	Fertilizers	Hydrogen	Iron & Steel	Total
Malaysia	322	12	20	58	NA	412
Vietnam	286	19	31	130	2,000	2,466
Indonesia	103	NA	21	NA	1,200	1,324
Singapore	NA	NA	NA	9	NA	9

Unit: million euros

Source: (Ghosh, Xi, and Won 2023)

The World Bank's "Relative CBAM Exposure Index" found that AMS' exports of CBAM products to the EU, as a percentage of their exports to the world at large in 2019, was generally small, mostly ranging between 1 percent (Singapore) and 6.2 percent (Indonesia), although Cambodia was 19.2 percent (World Bank 2023) (See Table 2). Another study concluded that as of 2019, only Malaysia was among the 20 most exposed countries to CBAM in terms of aggregate value of exports (ranking 18th) (UNCTAD 2021). Nevertheless, the World Bank estimated that Cambodia's aggregate relative CBAM exposure was very slightly negative, because Cambodia's exports were slightly less carbon intensive than the EU average, indicating that Cambodia benefits from CBAM by a small amount. The World Bank study concluded that the aggregate relative exposure of three AMS (Singapore, Philippines, and Thailand) was zero, and very slightly positive for three other AMS (Malaysia, Indonesia, and Viet Nam) (Table 2), indicating that their exposure is only very slightly negative.

Table 2: Selected AMS' CBAM Product Exports to the EU Share of Total CBAM Product Exports

Country	CBAM product exports to the EU/ CBAM product exports to world (%)	Most exposed sector	Aggregate relative CBAM exposure index
Singapore	1.0	Iron and steel	0.000
Philippines	1.6	Cement	0.000
Thailand	3.9	Iron and steel	0.000
Malaysia	5.5	Cement	0.001
Viet Nam	5.5	Iron and steel	0.004
Indonesia	6.2	Iron and steel	0.002
Cambodia	19.2	Fertiliser	-0.001

Source: (World Bank 2023) (2019 data)

This is because the countries' exports of CBAM products are generally very small or minimal. The share of AMS' product exports to the EU as a share of their GDP was less than 0.5 percent – almost zero – for each country (Park, Yamamoto, and Doong 2023). Another study concluded that the share of exports in CBAM-

related sectors in total exports of AMS was below 1 percent, except for steel, whose shares were only 5.2, 3.9, and 1.8 percent for Indonesia, Vietnam, and Malaysia, respectively (Ghosh, Xi, and Won 2023).

In Vietnam, a study conducted by the country's Department of Climate Change, in collaboration with the United Nations Office for Project Services, estimated that the EU's CBAM would reduce Vietnam's GDP by USD 100 million by 2030, and by 200 million by 2035 (based on current trends and USD 2019 levels). These are extremely small amounts compared to Vietnam's GDP of USD 332 billion 2019 (from IMF), about 0.06 percent. The steel and aluminium sectors would be significantly impacted since CBAM losses could account for 15-20 percent and 35-40 percent of the product prices of steel and aluminium, respectively, but the overall economic impact would be small since these sectors are small. The impact could be reduced by domestic carbon pricing. The study further noted that more generally, Vietnam is the EU's 15th largest trade-in goods partner, so if CBAM sector coverage expands in future, the impact on Vietnam would probably increase accordingly (L. Chu et al. 2023).

5. Current Status of Carbon Pricing Mechanisms in AMS

AMS have started to adopt or consider carbon pricing, but current levels are not sufficient to offset the EU's CBAM. AMS' carbon pricing should be more ambitious in order to be eligible to offset CBAM or achieve decarbonisation.

The section summarizes the current state of carbon pricing in AMS. Carbon pricing policies include carbon taxes and emissions trading schemes (ETS), with or without carbon crediting.

Singapore and Indonesia both have implemented carbon pricing to a degree, while it is legislated to come into effect in Vietnam in 2028. Mandatory carbon pricing is being considered in Malaysia, Philippines, Brunei, and Thailand (ASEAN+3 Macroeconomic Research Office 2022). Therefore, except for Singapore, carbon pricing mechanisms in ASEAN are still embryonic.

The pricing mechanisms and levels will need to be significantly increased to (a) close the gap in pricing with the EU, (b) capture CBAM revenue that would have otherwise been paid to the EU, and (c) encourage and fund decarbonisation of industries. Moreover, energy and fossil fuel subsidies remain extensive in the region (Foo, Lean, and Salim 2021), and they will need to be addressed as part of any carbon pricing policy to meet the EU CBAM's requirements. Current EU guidance states that the effective carbon price will take subsidies and rebates into account (European Commission Directorate-General Taxation and Customs Union 2023).

According to the Stern-Stiglitz report (CPLC 2017), global carbon prices must be at USD 40–80/tCO_2e by 2020 and USD 50–100/tCO_2e by 2030 to reach the Paris Agreement targets. Although 2020 is now past, global carbon prices have not yet reached this recommended level, including in ASEAN. Meanwhile, the IMF has argued for a global carbon pricing floor, adjusted to countries' development levels (Parry, Black, and Roaf 2021): USD 75 per ton for advanced economies, USD 50 per ton for higher-income emerging economies, and USD 25 per ton for low-income emerging economies. The current levels of carbon pricing in AMS are much lower than any of these proposed price floors.

Indonesia

Indonesia has implemented a domestic ETS covering its power sector from 2023, to be rolled out in phases. In 2023 it covered 99 coal-fired power plants representing over 81 percent of the country's power generation capacity (ICAP 2024). The ETS will eventually work as a hybrid "cap-tax-and-trade" system alongside a carbon tax, which is still being developed (International Carbon Action Partnership 2022).

While the carbon tax's framework legislation is in place (Presidential Regulation Number 98 of 2021 on the Implementation of Carbon Pricing), its implementing regulations are still being developed. Originally planned for April 2022, the tax's roll out has been delayed. The first phase is planned to cover the power sector, extending to the fossil fuel using transport sector in the second phase, although it is not clear when the policy will be rolled out (Antara 2024). Moreover, these policies may not be directly relevant to CBAM since transport is not one of the covered sectors, and it is not likely that Indonesia will export electricity to the EU. The cap-and-trade ETS was launched in September 2023 (Sulaiman 2023). Indonesia's voluntary pilot ETS, operated in the power sector, had an average price of USD 2 per tonne of CO_2e emissions.

Malaysia

The Ministry of Environment and Water published a "National Guidance on International Voluntary Market Mechanisms" in 2021 to develop domestic voluntary carbon market mechanisms. Malaysia's voluntary carbon market, the Bursa Carbon Exchange, was established in 2022 (ICAP 2024). The Ministry is also planning to develop a domestic emissions trading mechanism, partly in response to the EU's CBAM (ICAP 2022). As of mid-2024, limited concrete progress was made, but on 1 July, the Deputy Investment, Trade and Industry Minister said that Malaysia will soon begin to "facilitate carbon trading" and "consider a carbon tax" in response to the EU's CBAM so that Malaysia would collect the tax instead of the EU (Shazrie 2024).

Philippines

In 2020, the Philippine House of Representatives was considering a Low Carbon Economy Act which would establish a cap-and-trade system for the industrial and commercial sectors (ICAP 2022). The proposed Act was still under consideration in 2023 (ICAP 2024).

Singapore

Singapore's carbon tax took effect in 2019, although its rate is very low. It applies to the manufacturing sector, electricity supply and waste management companies among others. The initial rate was S$ 5/tonne of CO_2e from 2019-2023. It will progressively be ratcheted up to S$ 25/tonne in 2024-25, S$ 45/tonne in 2026-7, reaching S$ 50-80 per tonne by 2030 (National Environment Agency 2024). Therefore, while Singapore's carbon tax is compatible with the EU CBAM, its maximum level of S$ 80 to be reached by 2030 is still well below the EU's ETS price of approximately 80 euros/tonne (about S$ 115) in 2023, so it would not be sufficient to fully offset the border adjustment.

Thailand

As of April 2024, Thailand was considering a new climate change bill including private sector reporting requirements, development of a mandatory ETS, and a carbon tax on certain products (Baker McKenzie 2024). Thailand has an existing voluntary ETS (Thailand V-ETS), and "covered entities may be able to use offsets from Thailand's domestic crediting mechanism, Thailand Voluntary Emission Reduction (T-VER) …to meet up to 15 percent of their compliance obligations" (International Carbon Action Partnership N.D.).

Vietnam

Vietnam enacted the Law on Environmental Protection in 2020 and revised it in 2021. It established a domestic carbon market (Article 139) and mandated the design of a domestic ETS. Decree No. 06/2022/ND-CP implements the carbon market (USAID 2022; ICAP 2022). Trial operation starts from 2025, and the official operation from 2028 (Art 17 (1)(c); (2)(a) of the Decree). However, responding to the EU's CBAM, the government released a draft amendment of the Decree expanding the list of covered sectors

from the initial list (thermal power generation, industrial production, cargo transport, commercial buildings, and solid waste treatment) to include three CBAM-related sectors – power plants, steel, and cement. Also, the 3 CBAM sectors will receive government-assigned emissions quotas for 2025 and 2026 (Yin 2024).

Almost all AMS are participating in carbon credit mechanisms, which are a form of carbon pricing, while three countries – Cambodia, Myanmar, and Laos – had no plans to develop carbon pricing as of early 2024 (Rakhiemah et al. 2024). However, carbon credits are not currently eligible to offset the border adjustment, and the EU is not likely to make them eligible.

Overall, while carbon pricing is being considered or developed in several AMS, it is still in its early stages. Major progress would be necessary in order to enable AMS to offset CBAM's border adjustments to a significant degree. AMS have different levels of capacity to develop carbon pricing or other measures to respond to the EU's CBAM. Some countries may have sufficient capacity while may be not, although the countries with the least capacity may also be the least affected by CBAM.

6. Macroeconomic and Trade Competitiveness Impacts of Carbon Pricing and Possible Measures to Mitigate These Impacts

Concerns about negative macroeconomic and trade competitiveness impacts have long been key obstacles to stronger carbon pricing and other climate mitigation measures. These concerns will remain as AMS consider their own carbon pricing policies in response to CBAM. Therefore, this paper surveys global research findings on the economic and trade impacts of carbon pricing and possible measures to counter these impacts. Most of this research has been conducted on developed countries (we are not aware of studies on AMS), but they still provide some indication of the magnitude of the potential expected effects.

6.1 Research on the Macroeconomic and Trade Competitiveness Impacts of Carbon Pricing

Past research suggests that carbon pricing's impacts on macroeconomic and trade competitiveness may be significantly less than expected. Of course, carbon pricing by its very design seeks to reduce the relative competitiveness of sectors and facilities using high-emissions production processes and increase the competitiveness of those with lower emissions. However, the economy-wide impacts of low to moderate carbon pricing, including on competitiveness, may be fairly small.

'Competitiveness' is not easy to define, and studies have used various indicators, including welfare, profitability, output, market share, export volume, terms of trade, and employment levels (Carbone and Rivers 2017). This paper reviews studies using a variety of definitions.

Carbon pricing policies have some impact upon 'competitiveness' in terms of levels of output and exports of emissions intensive trade exposed (EITE) sectors. One study concluded that "there is significant agreement in the literature that unilateral emissions abatement is likely to lead to modest reductions in output and exports from emissions-intensive trade-exposed (EITE) sectors," there is likely to be some carbon leakage, and that a 20 percent reduction in GHG emission levels would reduce EITE output by approximately 5 percent and exports by 7 percent, although there is considerable variation among models (Carbone and Rivers 2017).

However, the study also found that computable general equilibrium (CGE) studies of the impacts of carbon pricing on countries' overall macroeconomic performance have generally found them to be small; a 20 percent reduction in emissions leads to a welfare loss (in monetary terms) of about 0.5 percent of pre-policy GDP on average, with most observations lying between 0 and 2 percent (Carbone and Rivers 2017). Competitiveness studies can be divided into theoretical (ex-ante) and case studies of jurisdictions that have implemented carbon pricing (ex-post). Both sets of studies find limited negative effects on countries' overall economic performance, and some find modest improvements in GDP and employment (Köppl and Schratzenstaller 2023).

The Carbon Pricing Leadership Coalition surveyed a range of studies on the impact of carbon pricing on trade competitiveness. The survey found that "where carbon pricing programs have been implemented, the number of firms that have truly faced this EITE competitiveness pressure is limited to a small number of sectors and specific regions" (Carbon Pricing Leadership Coalition 2019). Moreover, "there is little evidence to date that carbon pricing has resulted in the relocation of the production of goods and services or investment in these products to other countries," as "many studies conclude that other variables, including corporate tax rates, energy prices, wage rates, labour availability, infrastructure, geographic location, cost of capital, exchange rates, prices for commodities and materials, exert a stronger influence on most industry decisions to locate or invest" than carbon pricing or other environmental regulations (Carbon Pricing Leadership Coalition 2019). Most of these studies have three main limitations: 1) they are mostly based on developed economies, which may have a smaller share of EITE industries than in developing economies, 2) they are based on generally low carbon prices, and 3) they do not review impacts on specific installations. For the EU, the ETS free allowances also contribute to the low impact on competitiveness (Venmans, Ellis, and Nachtigall 2020). So the impacts could be larger for developing countries or if carbon prices increase (Fischer and Fox 2012; Droege and Panezi 2022). Nevertheless, low levels of carbon prices have had very limited economy-wide effects, especially with mitigating measures such as industry exemptions or border adjustments.

To be sure, much of this research is focused on developed countries, and is generally not focused on AMS, so the results are only suggestive. Impacts on AMS could be different. It is desirable to conduct research which is specifically focused on AMS.

6.2 Mitigation Measures for Carbon Pricing

Various mitigation measures can reduce carbon pricing's impact on EITE sectors and the overall economy such as free allowances (in an ETS), output-based refunding or allocation, industry exemptions, and border adjustments. These could be implemented by individual countries or regionally within ASEAN. However, free allowances and industry exemptions could not be applied to the sectors targeted by the EU's CBAM, and they should be phased out over time for effective climate mitigation, just as the EU is doing. The revenue from carbon pricing could be strategically employed to support decarbonisation and establish cleaner industries.

From a public welfare perspective, there are concerns that higher costs triggered by carbon pricing may hurt lower income people, for example through higher energy prices. Carbon pricing revenue could also be used to compensate them including support for energy access. Some studies have shown that there could be a "double dividend" effect of environmental taxes bringing social welfare benefits depending on what the revenues are used for; reducing social security contributions is the most effective, followed by reducing taxes on labor and capital, but lump-sum transfers are less effective (Köppl and Schratzenstaller 2023).

A World Bank report observed that "Middle-income countries including Brazil, India, and Türkiye have made progress towards carbon pricing implementation" (World Bank 2024, 9). The report further noted that "carbon pricing continues to offer benefits beyond mitigation, including as a fiscal tool" (World Bank 2024, 9).

7. Conclusion and Recommendations

In its present form, the EU's CBAM will not have a major impact upon AMS due to the small number of covered sectors and the small scale of ASEAN's exports to the EU in these sectors. However, the scope of the EU's CBAM is planned to be expanded in the future. Moreover, similar border adjustment mechanisms may be adopted by other countries, including ASEAN's other major trading partners, thereby increasing the pressure on ASEAN to adopt and strengthen carbon pricing. And China may adopt measures to offset the EU's CBAM sooner than AMS, thereby disadvantaging ASEAN's exports to the EU. Thus, ASEAN cannot avoid addressing this issue.

In response to CBAM, AMS should adopt more ambitious climate pricing schemes and introduce more advanced decarbonization technology. These measures should be incorporated in several key existing targets such as the ASEAN Plan of Action for Energy Cooperation (APAEC), ASEAN Carbon Neutrality Strategy, ASEAN Climate Change Strategy, and ASEAN Taxonomies of Sustainable Finance, including AMS' individual updated Nationally Determined Contributions (NDCs) and Net-Zero targets with more ambitious targets in line with the Paris Agreement goal (ASEAN 2021).

The EU, as well as other countries adopting CBAM, could collect significant revenue from it. It would be far better for AMS to secure the revenue for themselves through domestic carbon pricing mechanisms, rather than cede the revenue to the EU or other trading partners imposing similar measures.

This revenue can be used in various ways to address several key priorities, not only addressing climate change and trade competitiveness, but also energy security and poverty reduction. The first priority may be to fund industrial decarbonisation initiatives or other measures in order to avoid CBAM border adjustments, maintain competitiveness in EITE industries, and secure new renewable energy sources. Second, part of the revenue could be redistributed to sectors of society which may be adversely affected by climate change or climate mitigation measures, especially energy access for vulnerable populations. Third, other climate mitigation and adaptation measures could be supported.

Research summarized above suggests that fears over the trade and macroeconomic impacts of carbon pricing are probably overstated. These impacts may increase along with the carbon price. However, these impacts will diminish over time as more of ASEAN's major trade partners adopt carbon pricing as part of the global trend, narrowing the gaps in carbon pricing between different countries. Moreover, AMS could also adopt their own CBAM or other measures to offset any potential effects of adopting stronger carbon pricing on their own trade competitiveness.

Industrial decarbonization can complement carbon pricing in AMS' response to EU's CBAM. Carbon pricing incentivizes industrial decarbonization to reduce GHG emissions, generating revenue that can support the related investment while aligning ASEAN's policies with EU carbon pricing to minimize CBAM-related costs. However, it is not necessary to wait for the establishment of carbon pricing before implementing industrial decarbonization. It could be quicker, easier, and possibly even cheaper to directly introduce decarbonization technology to transform CBAM-related industries rather than wait for the development of complex carbon pricing policies. This would ensure long-term compliance with EU carbon intensity benchmarks while enhancing these industries' global competitiveness. Investment in industrial

decarbonization will be needed eventually, and quicker investment will better foster sustainable industrial growth and green job creation.

The effectiveness of carbon pricing, CBAM, and other climate measures would be enhanced by coordination within ASEAN, especially since much of ASEAN's trade is within the region. Also, some less developed countries may take longer to adopt carbon pricing or may have difficulty establishing a CBAM system, and both could be facilitated by cooperation within ASEAN, including consideration of possible coordination or harmonization of carbon pricing and CBAM within the region.

AMS have already taken major steps towards coordinating their climate-related policies and initiatives. ASEAN leaders prioritized interoperable carbon markets in the ASEAN Strategy for Carbon Neutrality released in August 2023, which calls for harmonized ASEAN Monitoring, Reporting, and Verification (MRV) standards and policies for a regional MRV framework to facilitate access to related financing and other assistance. The ASEAN Climate Change Strategic Action Plan 2025-2030 (ACCSAP), which is currently being developed (ASEAN 2022), and the ASEAN Centre for Climate Change (ACCC) (ASEAN 2023) are expected to establish and operationalise such schemes. Nevertheless, further efforts to strengthen coordination will be necessary to enhance the effectiveness of these measures.

Of course, in addition to offsetting CBAM, carbon pricing is the most cost-effective instrument to reduce GHG emissions. Therefore, AMS should make full use of carbon pricing to meet their NDCs in a cost-effective manner, in addition to using the associated revenue.

In negotiations with the EU, AMS could discuss four main points. First, the EU could be requested to accept the types of carbon pricing or other climate mitigation policies that the AMS are currently planning as eligible to offset the EU's CBAM adjustment. Second, simplification of the reporting and compliance procedures would be highly desirable. Third, the EU may be able to provide assistance for developing ASEAN's CBAM reporting and compliance mechanisms and possibly the development of ASEAN's own CBAM process. These points could be discussed at the ASEAN-EU Ministerial Meeting and EU-ASEAN Energy Dialogue.

AMS could also consider joining the Climate Club launched at COP 28 in order to have an early voice in developing international standards for border adjustment mechanisms. The Climate Club may also facilitate capacity building to smooth CBAM implementation and compliance (Climate Club 2023). Three AMS are already members (Indonesia, Singapore, and Thailand), and Indonesia is a member of the Steering Committee.[5] The other AMS would also benefit from joining.

Development of carbon pricing policies is very complex, and a CBAM system would be even more complex. The capacity of many AMS to develop these policies is limited so capacity building and related policy research support is very important. In particular, research is needed on how to design carbon pricing systems in ASEAN and their potential impacts and effectiveness, as well as the impacts of potential new sectors to be included in the EU's CBAM, and possible adoption of CBAM by other ASEAN trading partners. Research should also be conducted on how other countries' responses to CBAM, particularly by China, could affect AMS' trade competitiveness. Capacity building work for AMS also should be significantly enhanced so that government officials in consultation with related stakeholders could develop and introduce the necessary policies.

[5] See the Climate Club's website: https://climate-club.org/.

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