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Addressing the Risk of Carbon Leakage:

Assessing the EU's Carbon Border Adjustment Mechanism

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Contents

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1. Introduction

The international community has galvanised itself to combat climate change and limit global warming with commitments embodied in the Paris Agreement. Through nationally determined contributions (NDCs), each state commits to reduce its emissions of greenhouse gases. As developed and developing nations have differing levels of climate ambitions and commitments are decided by each state, there is a considerable variation between different countries. In principle, this is justified under the concept of "common but differentiated responsibilities". As a matter of practicality, too, there is otherwise no clear path to a global agreement.

However, the variation between different countries creates a significant risk of "carbon leakage". This is given the global patterns of production and trade. Situations can therefore arise where efforts to reduce greenhouse gas emissions in one country can inadvertently cause an increase in higher-carbon production in another country, leading to a rise in emissions. Unless addressed, the concern is that diverse standards, limits and pricing can cause carbon leakage and this may ultimately lead to a net increase in overall global emissions.

Responses to such concerns are taking shape and the first mover on this issue is the European Union (EU). In July 2021, the European Commission presented a formal legislative proposal to introduce a carbon border adjustment mechanism (CBAM) to resolve the problem of carbon leakage. If approved and enacted as an EU regulation, the CBAM will impose a charge on carbon-intensive imports of goods from outside the EU from 2026. While the proposal has its proponents, some of the EU's trading partners have expressed concerns about its content and approach, as well as the unilateral manner in which it has arisen.

In this paper, we aim to analyse the EU's proposed CBAM in a number of ways. First, we outline the problem of carbon leakage and other different types of leakages. Second, our paper tries to provide an understanding of the CBAM proposal – currently the only formal proposal put forward to address carbon leakage – and how it is meant to work in practice. Finally, the effectiveness and feasibility of the measure will be assessed before subsequently exploring two other proposals that experts have put forth.

This paper was produced from a review of academic literature, research studies, and news reports regarding carbon border measures. Most of these resources focused specifically on the EU's CBAM proposal. It also bears noting that academic research on the topic is still emerging, and most of the presently available studies have come mainly from developed countries. In contrast, analysis of the potential effects on developing countries, and on countries in the Association of Southeast Asian Nations (ASEAN), is currently limited. It can and should be an issue worth further consideration from the perspectives of these countries. In this context, our paper does not at this juncture focus on policy recommendations. We have a more limited aim for the present to analyse the EU CBAM proposal and debates surrounding it, and to highlight its implications for the ASEAN region.

Our overall assessment at present is that, even if theoretically sound, the CBAM proposal will likely face significant implementation challenges. Political resistance from trading partners is already rising, and there are potential legal challenges at the World Trade Organisation (WTO). This is coupled with practical feasibility issues and the mechanism's inability to resolve all types of carbon leakage.

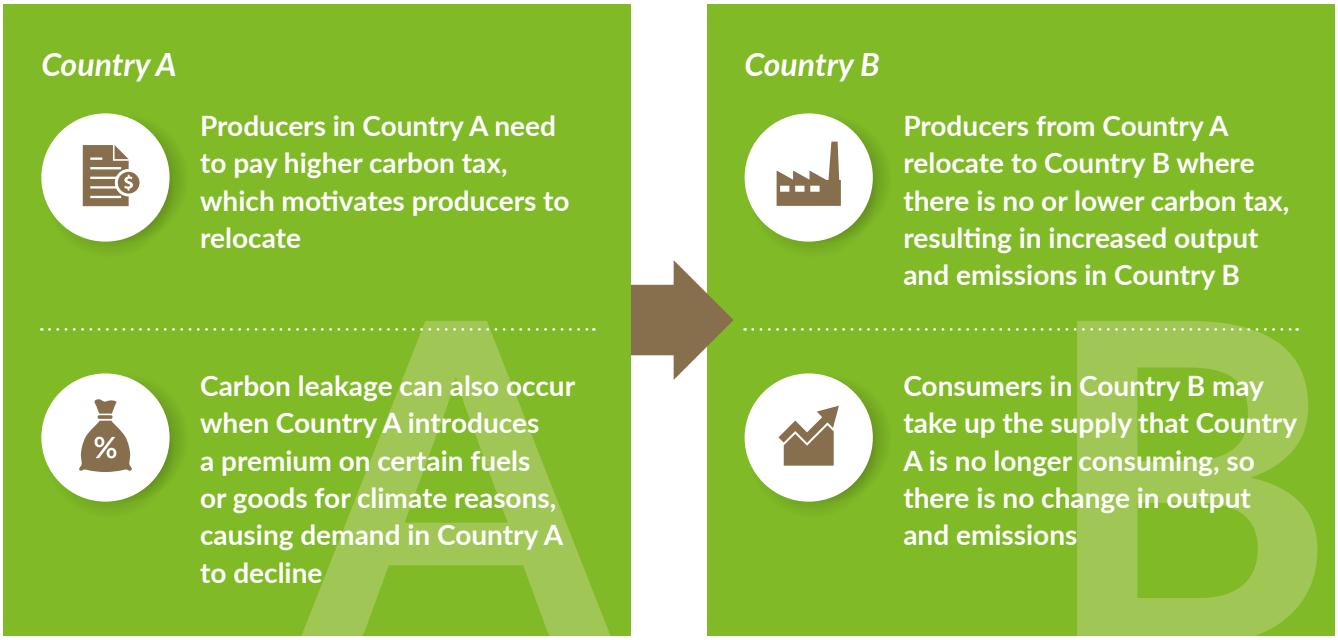
As such, it would be prudent for the EU to increase engagement with its trading partners as it moves ahead with the CBAM's design during the approval window, as well as during the transitional window following implementation. Correspondingly, it is important for ASEAN and other EU trading partners to deepen their understanding of the CBAM proposal and to generate improvements and possible alternatives. This is important because climate change is a global concern, as are the global economy and trading systems, and the mutually supportive and synergistic approaches, rather than misunderstanding and conflict, should be the intended outcomes.

2. The Problem of Carbon Leakage

The international community has been roused into combating climate change and limiting global warming as a matter of urgency. In recent reports by the Intergovernmental Panel on Climate Change (IPCC), scientists have warned that many changes in the ocean and sea levels are irreversible[1] and that temperatures are likely to rise by 1.5 degrees Celsius within the next two decades, unless there are immediate and rapid reductions in greenhouse gas emissions.[2] To achieve this goal, nations have agreed, under the Paris Agreement, to work towards their NDCs and bring about greenhouse gas emissions reductions.

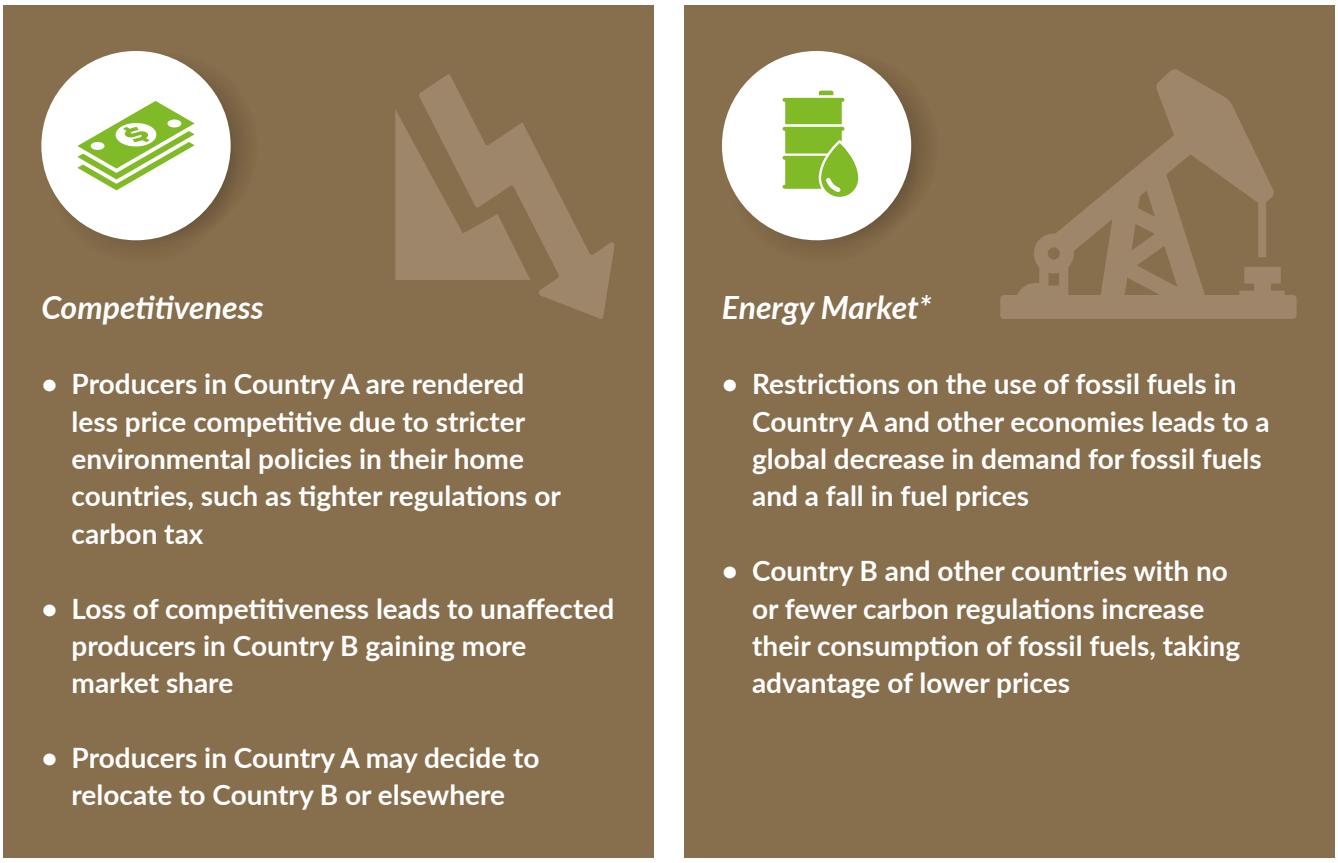
Yet as countries pursue their respective climate action plans based on "common but differentiated responsibility",[i] some governments with greater ambitions will inevitably impose stricter climate-related standards as compared to their trade partners. This results in a risk of carbon leakage – a situation where efforts to reduce greenhouse gas emissions in one country inadvertently cause an increase in emissions elsewhere.[3] There are several ways through which carbon leakage can take place, but the two largest channels, which policymakers are concerned about, are the "competitiveness" and the "energy market" channels.[4]

Figure 1: Carbon leakage explained



[i] *Tay defines 'common but differentiated responsibility' as the principle that all countries share a common responsibility for the global environment, but they have different abilities to contribute to discharging those responsibilities. See Tay, Simon (2021), "Economic integration, climate change, and sustainable development in East Asia" in F. Kimura et al. (eds), Handbook on East Asian economic integration, Cheltenham: Edward Elgar*

Figure 2: Two main channels of carbon leakage – competitiveness and energy market



* *There has been a sharp rise in fossil fuel prices in 2022 due to global demand increasing as economies recover from the pandemic, as well as the Russia-Ukraine war, but experts are still concerned about energy market carbon leakage in the long term*

Although there is growing concern in the policymaking community about carbon leakage, at present there is no conclusive evidence that carbon leakage is actually occurring. Various studies have attempted to estimate the impact of the phenomenon, for example, Böhringer et al.[5] suggested that there could be a global carbon leakage rate[ii] of up to 28 per cent from the European Union and 10 per cent from the United States – though other estimates vary. If it is indeed occurring, carbon leakage rate could effectively cancel out emissions reduction efforts by countries, undermining the efficacy of national climate policies.[6] It is also counter to the objectives of the Paris Agreement, which relies on collective goodwill and voluntary contributions to move towards a net-zero world.[7]

Considering the risks of carbon leakage and the multiple channels through which it occurs, policymakers have been debating the most effective solution to adopt. In the following section, this paper examines a milestone legislative proposal put forward by the EU to mitigate carbon leakage.

[ii] *Carbon leakage rate is defined by Arroyo-Currás et al. as 'the change in non-abating regions' emissions over domestic emission reductions'; Arroyo-Currás et al. "Carbon leakage in a fragmented climate regime: The dynamic response of global energy markets" Technological Forecasting and Social Change, January 2015. Accessed 1st October, 2021. https://www.sciencedirect.com/science/article/pii/S0040162513002606*

3. The Carbon Border Adjustment Mechanism: One Solution to Carbon Leakage

3.1 Background and Rationale

The European Commission has described the CBAM as a solution to the threat of carbon leakage. In essence, the CBAM will examine imports into the EU on the basis of their carbon intensity. Where the exporting country has no carbon pricing or one that is not equivalent to the EU's, CBAM will allow the imposition of an additional charge on those imports.

Carbon adjustment proposals have been on the EU's agenda for a long time. In 2007, the European Parliament observed that energy-intensive industries were under pressure from significantly high carbon prices set by the EU's Emissions Trading System. This loss of competitiveness increased the risk of carbon leakage, given that businesses would be incentivised to transfer production abroad in jurisdictions with fewer regulations. To address these concerns, the European Parliament called on the European Commission to examine the option of border tax adjustments as a solution.[8] In theory, by levying an equivalent carbon price on the carbon emissions of imported goods, a CBAM would create a level playing field for competition, thus ensuring that imports and domestic production are treated the same.[9] This would prevent the EU's climate policy aims from being undermined by production relocating outside of the EU.

The suggestion was ultimately not supported by the European Commission, who chose to extend free allowances of emissions for certain energy-intensive industries as an alternative.[10] One emissions allowance represents permitting one tonne of CO_2e emissions, and these allowances are traded on the EU emissions trading system (ETS). By granting free allowances to producers domiciled within the EU, the loss of competitiveness due to higher carbon prices would be mitigated. However, free allowances have also meant that the cost pressures on companies to be more efficient and reduce carbon were blunted.

Another attempt occurred in the aviation sector. In 2008, the EU sought to implement a directive that airline operators must deliver emissions allowances for carbon emitted from flights going through European airports. This would have affected not only European airlines who are subjected to EU regulations, but also all airlines that arrived in or even transited through the EU. The proposed directive was strongly resisted and later withdrawn following complaints from other countries that it was an extra-territorial imposition.

Nonetheless, commitments to push ahead on climate change have grown, with the EU's aim to be climate-neutral by 2050 as part of its commitments under the Paris Agreement.[11] In December 2019, the European Commission announced an ambitious Green Deal that would help the EU achieve its climate objectives.[12] This was accompanied by a comprehensive set of climate policies, including lowering the overall emission cap of the ETS within the EU. In tandem with these internal, EU-wide commitments, the European Commission introduced a proposal to introduce a new CBAM policy to address linkages between the EU and the global economy.[13]

According to the Commission, such a measure is justified by increased climate-related efforts driven by the EU Green Deal. Without a CBAM, the concern is that widening differences in levels of ambition worldwide will increase the risk of carbon leakage. Climate policies enacted by the EU may be offset if European producers relocate abroad to avoid the regulatory burden imposed on them within EU jurisdictions. In this context, the CBAM is seen by some as a necessary piece of legislation to avoid defeating the purpose of the EU Green Deal.[14]

Internal policy changes will also proceed. The European Commission takes the view that the present system of free emissions allowances for EU-based businesses is ultimately an unsatisfactory policy that weakens the price signals and incentives for companies to invest in green technology. The EU is therefore aiming to phase out free allowances so that the ETS can have optimal impact, with implementation in an even-handed manner across sectors.[15] To complement these steps, the CBAM is therefore seen as a necessary and a preferable mechanism.

The CBAM is following ordinary legislative procedure for the EU, whereby proposals from the European Commission are also agreed on by the EU Council of Ministers and European Parliament. On 15 March 2022, the EU Council agreed on a common approach to the European Commission's proposal – the Council's position was broadly similar to the proposal, with a few differences, namely calling for greater centralisation of CBAM governance at the EU level, rather than each individual EU member state running its own registry of CBAM importers. The Council also added some measures to help small businesses avoid negative impacts. On 22 June 2022, the European Parliament adopted a position on a package of EU climate draft laws, including the CBAM, calling for a broader scope of goods to be covered by the CBAM at its inception than the European Commission's original proposal and accelerated implementation of the measure. These moves mean that the CBAM policy is now very close to becoming reality.

Table 1: Beyond the EU – proposed carbon border adjustments in developed economies

Country	Position on Carbon Border Measures
USA 	• Democrats in the United States Senate have advocated for a "polluter import fee" to combat climate change, though the US does not have an official carbon price from which to benchmark a border levy.[16] • John Kerry, the US Special Presidential Envoy for Climate, has said a carbon border adjustment should be a last resort due to its implications for international trade.[17]
Canada 	• Prime Minister Justin Trudeau's government is exploring the possibility of a carbon border adjustment, and is engaging with Canadians and international partners to "advance a global dialogue on this important issue".[18]
UK 	• The Conservative government in the United Kingdom is considering a carbon border tax adjustment,[19] amid concerns that heavy industry may be driven to relocate due to the UK's efforts to cut emissions by 78% by 2035.[20] • However, others in the UK are opposed to a British carbon border tax and are lobbying against the EU's CBAM.

So far, no countries in Asia have proposed enacting a CBAM. China responded negatively to the EU's CBAM proposal, calling it a violation of WTO principles.[21] Others in Asia, too, have their reservations. However, Asian climate leadership is growing, with countries such as China, Japan, and South Korea having announced net-zero targets to be met within the next few decades. China has also launched an emissions trading system which, due to the sheer size of the Chinese economy, covers some 15 per cent of global emissions.

As China and other Asian economies increase their efforts to decarbonise, the same logic to address the linkages of trade and investment – and the potential carbon leakages – will apply. Thus Asian countries may also need to consider border adjustment measures to maintain competitiveness while meeting national climate goals.

3.2 Elements of the EU's CBAM and How it Will Work

The use of border adjustment measures to deal with carbon leakage is being considered by many countries. Yet at present, only the EU has published specific details about how such a system would work. Considering the proposal in some detail can therefore be useful in seeing how a CBAM policy would be implemented in practice. While the mechanism's design may yet evolve over time, the following analysis is based on the European Commission's July 2021 legislative proposal[22] and other secondary sources at the time of publication.

Figure 3: The EU's Carbon Border Adjustment Mechanism (CBAM)

When the EU's CBAM is implemented, importers may claim in their declarations to EU authorities that their goods require fewer CBAM certificates to be purchased and surrendered, if it can be proven that a carbon price has already been paid in the country of origin for the embedded emissions.[23] Pursuant to Article 9 of the legislative proposal, the importer must keep records of the relevant documentation, certified by an EU authority. The exact methodology for calculating the reduction is not specified, but the CBAM would empower the European Commission to determine this.[24]

Likewise, to ensure that the measure is applied in an even-handed way, the required number of CBAM certificates are assumed to be reduced to reflect free ETS allowances allocated to producers within the EU.[25] This ensures that importers' competitiveness will not be doubly impacted by the CBAM and the provision of free ETS allowances.

4. Effectiveness and Feasibility of the EU's CBAM

The EU's CBAM proposal appears theoretically sound, with a clear objective of tackling carbon leakage, and the proposal details how it will be executed from 1 January 2023 onwards. Nevertheless, this paper finds that the legislative proposal may face significant political and legal challenges if it is enacted as an EU regulation. Moreover, its effectiveness and feasibility as a large-scale mechanism is questionable, given the lack of awareness and readiness among nations, especially developing ones, regarding meeting its requirements. This is a concern given the relatively short transitional window of 2023 to 2025 before the measure is fully implemented. Moreover, it is noteworthy that a CBAM does not resolve carbon leakage that occurs through the energy market channel. Its usefulness is therefore limited to mitigating competitiveness-related carbon leakage.

In light of these critiques, the EU's CBAM proposal may not be the most desirable solution in its current form. The following section will expand on these challenges.

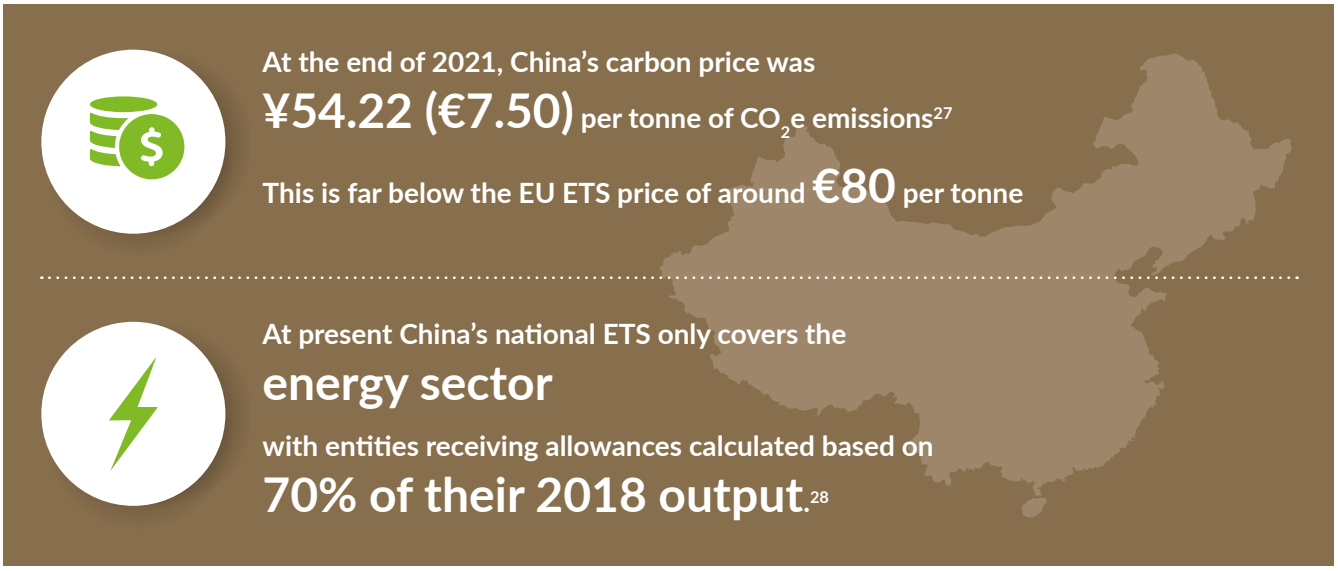
4.1 Political and Legal Resistance from Trading Partners

4.1.1 Political Resistance

According to trade data, CBAM-covered exports to the EU are concentrated among a few countries, with Russia, China, and Turkey accounting for more than one-third of affected trade.

While Russia and Turkey have explored national carbon pricing in the past, there are currently no nationwide cap-and-trade systems or carbon taxes implemented.[26] While China has launched a national ETS, its prices remain significantly lower compared to the EU ETS. Without comparable carbon pricing to the EU's, China will be subject to the CBAM regulation and could be significantly impacted.

Figure 4: Carbon pricing in China



Unsurprisingly, the EU's major trade partners have thus expressed concern over the CBAM proposal.

At the heart of these complaints lie the perception that the CBAM regulation is inconsistent with WTO and UNFCCC principles, with some critics arguing that the policy is both protectionist and unfair. A 2021 expert study conducted by Konrad Adenauer Stiftung found that many expert stakeholders in

Asia-Pacific regard the CBAM as a measure designed primarily to protect EU businesses.[29] A common refrain is that its blanket application does not account for the "common but differentiated responsibilities and respective capabilities" principle within the United Nations Framework Convention on Climate Change (UNFCCC) and the voluntary, bottom-up approach in the Paris Agreement. Individual countries, especially developing nations, are supposed to be free to pursue carbon emissions reduction in a manner that is most suitable to their circumstances, but the CBAM effectively has a punitive effect on jurisdictions that do not introduce carbon pricing measures that are identical to the EU's. Lower and middle income countries could be disproportionately affected – one expert analysis found that the Eastern European and Central Asian trading partners of the EU would be most exposed to the CBAM by percentage of GDP.[30]

Table 2: Concerns from the EU's trade partners about the EU's CBAM

Country	Concerns
Brazil, China, India, South Africa 	Issued a joint statement labelling unilateral carbon border adjustments as "discriminatory and against the principles of equity".[31]
Russia 	Has calculated that it could lose US$7.6bn from the measure, saying the prospect of an additional financial burden on trade is "extremely unpleasant".[32]
Australia 	Criticised the EU's CBAM as "detrimental to global growth and to free trade globally", and a measure that risks "enhancing protectionism".[33]

Another issue is that under the European Commission's CBAM proposal, the revenue generated from the CBAM would go into the EU's "own resources feeding into the EU's budget", covering the costs of the EU's COVID-19 recovery package.[34] This is unlikely to sit well with the developing countries and will not assuage fears of disguised protectionism.

The European Council's official media release about the body's agreement on the CBAM, issued on 15 March 2022, stated that the main objective of the CBAM is to avoid carbon leakage and encourage the EU's trade partner countries to decarbonise. But the release also framed the policy in terms of protecting European businesses and Europe's energy security. France's Minister for Economic Affairs, Finance and Recovery Mr. Bruno Le Maire said: "The agreement in the Council on the Carbon Border Adjustment Mechanism is a victory for European climate policy. It will give us a tool to speed up the decarbonisation of our industry, while protecting it from companies from countries with less ambitious climate goals. It will also incentivise other countries to become more sustainable and emit less. Finally, this mechanism responds to our European ambitious strategy that is to accelerate Europe's energy independence".[35]

Additionally, in principle the EU is supposed to phase out free allowances in its ETS after the introduction of a CBAM. However, if the EU's CBAM policy is implemented and there is an overlapping period where the EU continues to also allocate free allowances, then this might constitute an illegal subsidy in violation of WTO rules.

It bears mentioning that the CBAM proposal has not enjoyed unanimous political support within the EU either. For example, countries with major industries that depend on steel or aluminium worry about the cost implications to their businesses. However, internal EU oppositions to the CBAM are beyond the scope of this paper.

Figure 5: Impact of the EU's CBAM on ASEAN economies

4.1.2 WTO-compatibility of the EU's CBAM

The aforementioned political resistance will likely trigger legal challenges at the WTO or other trade mechanisms.[iii] For its part, the EU has consistently maintained that the aim of the CBAM is purely

[iii] *In addition to the issues discussed in this section, there are also potential compatibility issues with the WTO Agreement on Import Licensing Procedures (ILA). CBAM could be construed as a licensing scheme, and it may not take into account developing country considerations as required under ILA 1.2.*

environmental.[37] In response to the concerns of trading partners, the EU's economy commissioner Paolo Gentiloni insisted that the CBAM was "in line with and compliant with international trading rules".[38] A possible justification for this is perhaps described in an independent policy brief commissioned by the European Parliament,[39] and a resolution adopted by the European Parliament entitled *Towards a WTO-compatible EU carbon border adjustment mechanism*.[40]

National Treatment Rule

The CBAM regulation must meet the criteria in the WTO provisions that allow for border adjustment. Given the argument that the CBAM is designed to accompany the EU ETS rather than impose an outright tax on imports entering the EU, the measure is likely to be considered a "regulation" rather than an "internal tax".[41] Thus, CBAM must – at the very least – live up to Article III:4 of the General Agreement on Tariffs and Trade (GATT), the national treatment principle.[iv] This means that, under the CBAM, imports shall be accorded treatment no less favourable than that accorded to like-products in the EU.

Some past WTO rulings have held that products will be deemed as "like" notwithstanding their differences in carbon footprint. In other words, imported "dirtier" steel with higher embedded emissions and "cleaner" EU-manufactured steel are considered like-products. On the other hand, recent rulings on technical barriers to trade within WTO suggest that processes and production methods (PPMs) can be taken into account as a basis to differentiate between goods. With regards to the proposed CBAM, the EU is likely to argue that any carbon-intensive imports to the EU will still be accorded national treatment on the same terms as EU products.

This is based on two grounds: First, there is no *de jure* discrimination between imports and EU products.[42] CBAM certificates will be priced according to the weekly average auction price of the EU ETS allowances, and thus imports will be charged with the same rate per tonne of carbon as goods from within the EU.

Second, as mentioned earlier, the EU is expected to phase out free allowances or provide equivalent allowances to CBAM importers under its ETS after a CBAM policy is implemented. This will avoid double protection for EU products, which would surface if free emissions allowances for EU-domiciled industries were preserved while importers were required to surrender CBAM certificates.[43]

Notwithstanding the claims above, the EU's trading partners could assert that there is *de facto* discrimination. The reporting requirements under the CBAM from 2023 onwards will put imports to the EU on an unequal footing, as the information duty and legal due diligence required of foreign entities under CBAM are more onerous than the reporting requirements under the EU's ETS. This could be construed as a de jure violation of WTO national treatment principles. CBAM will require non-EU producers to reveal their production methods to establish their emissions, and have their calculated emissions verified by an EU certified authority. If non-EU producers refuse to submit this data, or the EU does not accept their emissions data, then the EU commission will apply an emissions rate based on the average of the worst 10 per cent of polluters in the EU. Additionally, the CBAM policy does not provide for exclusions, while the ETS does for small installations and where emissions fall below a certain threshold. Some EU member states also have national subsidies for certain industries to offset the effects of the ETS, but foreign producers whose products fall under CBAM would not have similar benefits.

[iv] *Even if the CBAM was considered a tax, since the obligation to pay accrues at the moment of and "by virtue of the event of importation", it would still have to fulfill the national treatment rule under Article III(2) GATT. See "China – Measures Affecting Imports of Automobile Parts" Report of the Appellate Body, World Trade Organisation, WT/DS339/AB/R, WT/DS340/AB/R, WT/DS432/AB/R, December 15, 2008, paras 158, 161.*

Most-favoured-nation Rule

Beyond this concern, the CBAM regulation would also have to abide by the most-favoured-nation treatment (MFN) rule under GATT Article I. This requires that there must be no discrimination between like-products imported from different countries of origin. Any advantage afforded to the imported products of one WTO member must also be given immediately and unconditionally to all like-products originating from other WTO members. Any benefits must be multilateralised.[44]

From this perspective, the CBAM regulation can be deemed as discriminatory. The EU's CBAM policy will apply to all non-EU or EEA trade partners, but as discussed earlier, manufacturers in some countries will be more able to meet the reporting and disclosure requirements mandated under the CBAM, while others will experience challenges and therefore be faced with a higher rate. Imported like-products deemed to have lower carbon embedded emissions would surrender fewer certificates than those calculated to have higher embedded emissions. Moreover, the number of certificates can also be reduced if a carbon price has already been paid in the country of origin. Once again, the EU would have to rely on GATT Article XX to justify the deviation from the MFN rule.

General Exceptions Based on GATT Article XX

The EU may have to argue that the CBAM regulation qualify for the general exceptions (on the grounds of preservation of exhaustive resources or human health) per GATT Article XX. The EU has had some success invoking another WTO exception, by arguing that such import restrictions are necessary for defending "public morals". Alternatively, there are past WTO rulings which suggest that national treatment obligations are met, if the detrimental impact can be explained by factors that are unrelated to the foreign origin of the product.[45] For instance, if the EU can demonstrate that the higher carbon footprint in foreign products is due to their production and processing methods rather than their foreign origin, it is possible that no *de facto* discrimination will be found. Ultimately, there is no clear answer as to the compatibility of the CBAM regulation with Article III:4, which may induce undesirable trade litigation.

Significant pressure thus falls on Article XX, and whether it can be used to justify the CBAM regulation. Specifically, the EU would seek to prove that the CBAM regulation is necessary to protect human, animal or plant life or health under Article XX(b) or is related to the "conservation of exhaustible natural resources" under Article XX(g). To qualify for Article XX(b), the EU must show that the CBAM is the only option that would allow it to protect health concerns; the EU would need to prove the policy is not arbitrary, unjustifiable, that it is the least trade-restrictive measure reasonably available.[46] The EU must also demonstrate that the CBAM policy is necessary for its stated objectives and not a disguised restriction. In this regard, the oft-repeated claim that the purpose of CBAM is to "level the playing field" is problematic. Critics of CBAM have maintained that the EU has not attempted to negotiate in good faith to achieve a multilateral solution to carbon leakage – it has therefore not yet exhausted all alternatives[47] and proven that CBAM is "least trade restrictive" for the regulatory standard it seeks. As elaborated in Section 5 of this paper, there are alternative proposals to CBAM that can also promote sustainable trade.

As an alternative, the EU could therefore seek to justify the CBAM regulation under Article XX(g). This would involve asserting that it is related to the conservation of exhaustible natural resources as long as the measure is used in conjunction with similar restrictions on EU production. However, while the CBAM regulation aims to combat climate change, it is framed in terms of minimising carbon leakage rather than conservation of resources. Also, carbon emissions (or global average temperatures) are not an exhaustible "resource" as such. The EU must demonstrate that there is a "close and genuine" relationship between the border adjustment on imports and conservation goals.[48] In this regard, the fact that the revenue generated from the border adjustments will go to the EU budget may also attract scrutiny.

Assuming the EU passes the "close and genuine" relationship test, the chapeau of Article XX also provides that measures must not constitute "arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade". On the issue of arbitrary or unjustifiable discrimination, the importance of fairness and justice in the implementation of a measure has been emphasised in past WTO rulings. In this regard, the EU will most likely argue that calculating the number of CBAM certificates to be surrendered based on the carbon content of products and the carbon price paid in the country of origin is specifically on environmental grounds, and is therefore not arbitrary in nature. It could also be suggested that conditions prevalent in other countries are not the same due to differences in carbon pricing policies.

None of these arguments are foolproof. In particular, the imposition of a unilateral standard on other countries without a thorough process of mutual dialogue is questionable. Indeed, where unilateral measures and laws were challenged in past WTO cases, the need for consultation and multilateral assistance to trading partners has been emphasised. Similarly, the power asserted by the European Commission to decide on the methodology for accounting for other countries' carbon pricing policies might not be justifiable. From this perspective, the CBAM regulation may have an "intended and actual coercive effect on the specific policy decisions made by foreign governments", which has been condemned in past WTO rulings.

Finally, Article XX states that the CBAM regulation cannot be a disguised restriction on international trade. As such, the intentions of the EU must be genuinely environmental in nature. In this context, there were suggestions that the revenue generated by CBAM should be used to assist developing countries pivot towards cleaner production. Thus far this has not been done. As noted earlier, the European Commission's CBAM proposal envisaged that revenues would go to the EU itself, in the context of repaying the debt generated by the EU's COVID-19 recovery package.

At this paper's time of writing, the European Council has called for further discussion on the question of how CBAM revenues will be utilised. But if revenue does indeed feed into the EU budget in the policy's final implementation, this could become a problematic issue insofar as it would invite allegations that the CBAM is not for purely environmental goals. Conversely, if the EU's CBAM revenues are used to provide technical assistance for manufacturers in developing economies to meet the carbon accounting standards mandated by the EU, this would go a long way towards assuaging concerns about the policy. If producers are unable to do detailed carbon accounting, the CBAM will apply a default emissions value to producers based on their country of origin, which could be unfavourable to businesses.

The legal questions arising out of the CBAM proposal are complex and still evolving. The EU faces an uphill battle to ensure that the validity of CBAM is not challenged by trading partners. Moreover, passing the legal test is merely a minimum requirement; it does not guarantee political acceptance of the CBAM. Should widespread political resistance remain, the measure's effectiveness in achieving its overarching goal of advancing global climate action may be called into question.

4.2 Feasibility of Implementing the EU's CBAM

Apart from legal and political resistance, the feasibility of implementing the CBAM regulation on a large scale is also unclear. Annex III of the CBAM proposal outlines the methods that producers will have to follow to calculate the embedded emissions in their products. Most of the focus in the proposal appears to be on direct emissions, but the methodology provided is complicated.[49] For instance, calculating the direct embedded emissions for "complex" goods requires the embedded emissions of input materials consumed in the production process.[v]

[v] *Complex goods are goods that require the input of other simple goods in its production process. Simple goods refer to goods that are produced in a production process requiring exclusively input materials and fuels having zero embedded emissions. See European Commission (n 19), Art. 1(a) and (b), Annex III.*

Smaller producers in emerging economies, such as India or Indonesia, may struggle to adapt to these administrative requirements due to costs associated with EU certification. Many companies across the complex supply chains in Indonesia do not record their emissions data, and hence are not prepared to comply with the CBAM regulation.[50] Likewise, in Thailand, emissions data is measured differently as compared to the EU, and the methodology used is less detailed. Thai stakeholders have further pointed out that the EU's intention to implement the CBAM at the start of 2023 is "too short of a timeline" due to intervening priorities, such as the COVID-19 pandemic.[51]

Such practical concerns, coupled with the high carbon price on the EU ETS, may have the unintended consequence of growing leakage markets. This could potentially result in the world splintering into a low-carbon bloc and a high-carbon bloc.[52] To avoid the hassle of trading with the EU, producers in developing economies may elect to sell their products in other markets with less stringent regulations or to trade domestically. For instance, an expert in Indonesia interviewed for the KAS study commented that "without help from the EU, developing countries have to be pragmatic and look for other markets".[53] In a similar vein, in response to declining palm oil demand from Western markets due to sustainability concerns, Malaysia's Minister of Plantation Industries and Commodities said that Malaysia should look towards new Middle Eastern and Central Asian markets instead. While the EU is a large economy and market overall, this does not apply across all trading partners and for all sectors and products. Where the EU market lacks size and influence, the CBAM may have the effect of shutting out emerging-market exporters from its markets and then simply re-directing those exports to other markets. The CBAM can limit EU imports but not, in such a case, truly impact actual production and carbon emissions; border and trade measures continue to be second-best efforts compared to changes in production itself.

There are also concerns about the fair administration of the CBAM scheme, and whether EU authorities will be able to handle the administrative burden of implementing the CBAM regulation fairly and consistently across all trading partners.[54]

As noted, a reduction of CBAM certificates would be applied based on the carbon price paid in a product's country of origin. This is on the condition that the goods are not subject to an export rebate or any other compensation on exportation.[55] As such, the EU requires evidence of the carbon price paid, and the absence of export rebates, to be certified by an independent person. The relevant authorities would thus have to bear the tedious task of verifying all relevant documentation provided by producers from across the world. Given that countries' carbon pricing policies are patchworks of regulations and subsidies, the evidence may come in different forms. The difficulty of ensuring that these records are authentic and accurate may allow for the reduction in CBAM certificates to be exploited.

4.3 Inability to Fully Address All Sources of Carbon Leakage

As mentioned earlier, in the energy market channel of carbon leakage, global energy prices fall due to decreased fossil fuel demand when certain countries put environmental restrictions in place. This in turn encourages fossil energy consumption in other countries with fewer such restrictions, leading to an increase in overall emissions. Since the CBAM regulation only tackles the issue of competition and does not address price effects, carbon leakage through the energy market channel will not be mitigated.

Such inability to fully address all sources of carbon leakage is concerning, since the exact proportion of carbon leakage caused by the energy market channel is debatable. Modelling literature suggests most carbon leakage occurs through the energy market.[56] A study by the Leibniz Institute for Economic Research found that a third of carbon leakage was driven by the energy market channel and would not be addressed by border adjustments.[57]

5. Alternative Proposals for Encouraging Sustainable Trade

Although many of these potential challenges are speculative at present, it is evident that the EU's CBAM regulation could face significant hurdles even if successfully enacted. Opposition from major trading partners may lead to protracted legal disputes – and the EU's trade partners may also be more inclined to retaliate rather than litigate, for instance via tariffs imposed on EU steel, or displacement of the EU's agri-food products and machinery on other grounds.[58] The administrative feasibility and effectiveness of the measure is also in doubt.

Given these concerns, experts have put forth alternative proposals for encouraging sustainable trade. These include the prospect of linking or harmonising several ETS schemes under a single multilateral emissions trading system. The OECD has also proposed to negotiate an inclusive framework on carbon pricing, including non-OECD countries, similar to the OECD's recent global tax deal.

Two particular solutions will be discussed in this section. These are highlighted based on their potential to circumvent difficulties arising from the CBAM proposal while addressing carbon leakage concerns. However, it should be noted that they are not direct substitutes for the CBAM and are not meant to be taken as policy recommendations for the EU or other countries considering carbon border adjustments.

5.1 "Carbon Club" and International Carbon Price Floor

In principle, the idea behind a "carbon club" is that a group of countries agree among themselves on an international target carbon price. Notably, Germany, the largest economy in the EU is in favour of such a solution, and German Chancellor Olaf Scholz has proposed that the G7 nations be founding members of a carbon club.[59] The German government has not explicitly framed the introduction of a carbon club as a replacement or alternative for a CBAM policy, though Chancellor Scholz has said that such a club could help avoid trade frictions arising from climate protection measures in the EU. Nonetheless, a carbon club could implicitly imply that any major economy deciding to stand outside of it would be subjected to a border adjustment measure like CBAM, which will incentivise other major economies to conclude a carbon club.

Figure 6: Example of a carbon club – an international carbon price floor (ICPF)

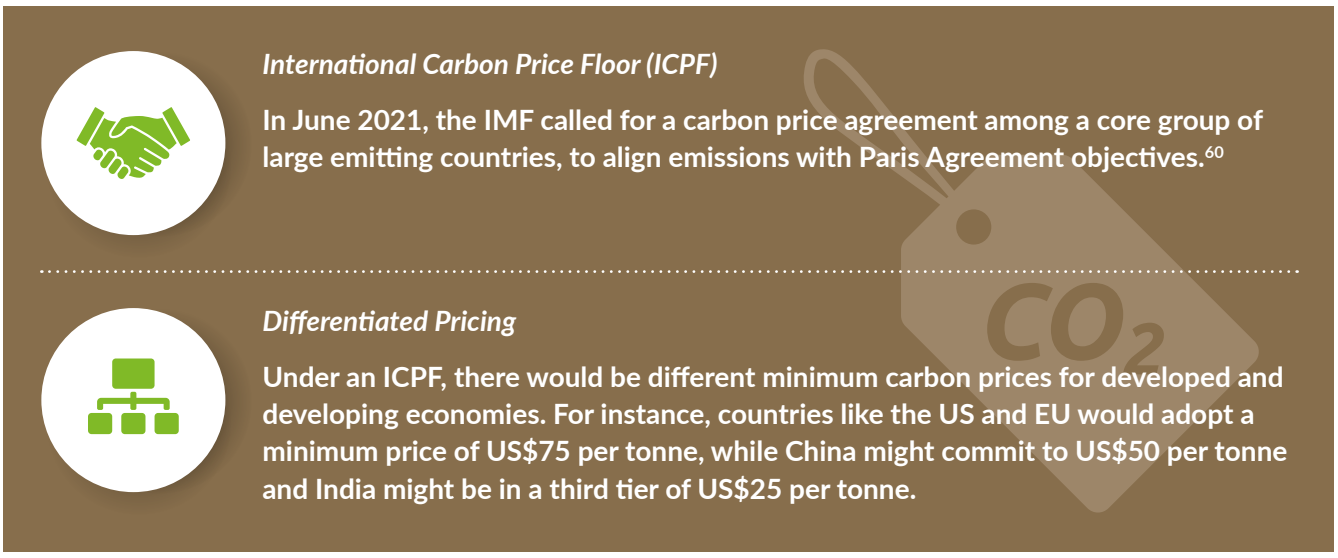


Figure 6: Example of a carbon club – an international carbon price floor (ICPF) (Cont'd)

Advantages of the ICPF

The mechanism would have relative ease of implementation and would not create an administrative burden like the EU's CBAM.[61]

Projected Impact

The IMF estimates that if the "big six" emitters, China, United States, India, the EU, Canada, and the UK, all commit to an ICPF, this would reduce emissions sufficiently to keep the global temperature increase to under 2°C.

Implications for Carbon Leakage

By including large developing economies in the deal, carbon leakage would be mitigated. Producers in China and India would be subject to a known level of carbon pricing, levelling the playing field while reducing overall global demand for fossil fuels.

Crucially, a carbon club deal, like the IMF's proposed international carbon price floor (ICPF), could have fewer political obstacles than a CBAM. The voluntary nature of such an agreement, as opposed to a unilateral CBAM, is in line with the spirit of multilateralism and cooperation in the Paris Agreement. Assuming developed economies accept that differentiated carbon prices are required due to differing economic situations, there should be no complaints of disguised protectionism that have plagued the CBAM proposal. On the legal front, there are no WTO-related impediments since the mechanism would not involve trade policies, and instead be implemented through national and internal policies that directly impact production, pricing, and consumption.

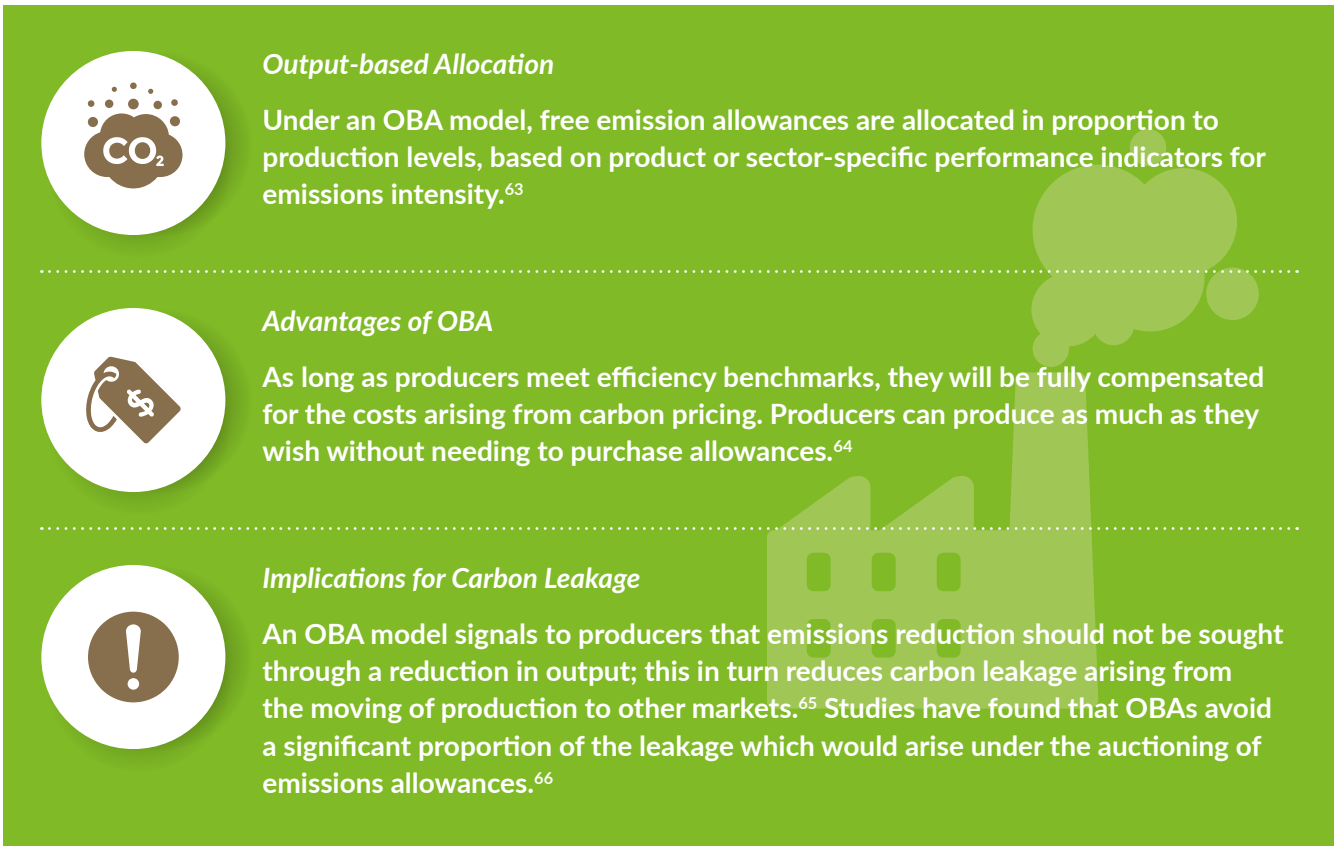
It should be noted that the IMF's ICPF is not the only possible approach to a carbon club. A carbon club could also take the form of a sectoral based deal on emissions reduction rather than a common carbon price, combined with a common external carbon adjustment.

For the EU, pursuing a plurilateral approach through a carbon club would demonstrate the bloc's sincerity and desire to achieve a suitable solution for all parties. Should the EU advocate for an international carbon club and then fail, it would then give the EU greater justification and political legitimacy to enact a CBAM regulation. In this hypothetical situation, the EU could argue that it would have exercised all reasonable endeavours and acted in good faith before resorting to border adjustments. This could be useful in defending its effort against charges of unilateralism under the WTO rules; alternatively, the EU's forthcoming adoption of a CBAM policy could serve as an incentive for other major economies to participate in a carbon club arrangement.

5.2 Output-based Allocation of Allowances

Another alternative proposed is an output-based allocation (OBA) of free emission allowances, to be complemented with a consumption charge on carbon-intensive industrial materials. OBAs distribute tradable emissions allowances to producers in industries at high risk of carbon leakage, in proportion to their current production level.[62]

Figure 7: Output-based allocation (OBA) of free emission allowances



How to benchmark the allowances remains an issue. One hypothetical benchmark could be the performance of the top 20 per cent of firms in a given sector with the lowest emissions intensities. As an example, the emissions-rate benchmark for grey cement in Canada is 0.733 tonnes of CO_2e emitted for every tonne of cement.[67] Producers who meet this benchmark are deemed to be carbon-efficient and would receive all the allowances they require to cover emissions from their current production levels.[68] As emissions allowances would be granted in direct proportion to production levels, they can be seen as a subsidy to production.

Nonetheless, OBAs come at a cost. Since OBAs fully compensate producers who meet the emissions benchmark, the true cost of emissions is not passed on to consumers. Consumers thus have a weaker incentive to choose "greener" products. This in turn limits the incentive for companies to conduct further research and development on carbon reduction technologies.[69] Proponents for OBAs recognise this and suggest that the measure is to be paired with a consumption charge more directly on carbon-intensive products to restore consumer price signals.[70] The charge would be levied at the point of sale and calculated based on the carbon content of the product. This incentivises producers to supply lower-carbon goods.

The OBA model supplemented with a consumption charge is preferable to a CBAM for two reasons. First, the EU is already moving towards an output-based allocation of free emissions allowances. In Phase 3 of the EU ETS (2013 – 2020), allocations were granted based on a 5-year average historical activity level. However, since Phase 4 of the EU ETS began in 2021, allocations can be adjusted annually to reflect fluctuations in actual production levels.[71] Second, like ICPFs, OBAs involve less of an administrative burden than a CBAM, as the EU would not need to factor in their trading partners' regulations. Finally, an OBA does not involve trade policy and is less likely to induce related litigation.[72]

These two alternatives to border measures and the EU's CBAM proposal bear evaluation. There can be different policies and processes to address carbon and climate change, in tandem with the competitiveness of business, and global trade and investment.

6. Conclusion

As the world moves towards carbon neutrality and net-zero goals, there will inevitably be differences in climate ambitions. Producers in heavily regulated jurisdictions must be subject to higher carbon prices than their competitors. With trade an indispensable part of a modern, interconnected world, this push for climate action has a direct bearing on economic competitiveness. The issue of potential carbon leakage that undermines climate goals should not be ignored.

Some major and influential economies may be inclined to pursue unilateral actions to solve the problem of carbon leakage. So far, the EU is the only developed economy to introduce a CBAM proposal to address carbon leakage, but it has been subject to intense debate and criticism among trading partners. The proposal is also not guaranteed to pass internally, as it has yet to be approved by the European Parliament and the Council of Ministers. The legal and political obstacles are significant, and there are concerns that the regulation is administratively unfeasible and would take years for EU importers and foreign producers to adapt to.

Should the EU ultimately choose to move ahead with its CBAM regulation, it should do so with consideration to the objections that have been raised, and with the broader aim of seeking a truly multilateral solution to achieving shared climate goals. Other means to address carbon leakage can also be considered.

For Southeast Asia, it would be unwise to adopt a nay-sayer or even a wait-and-see approach. The reality is that given the fast-growing ASEAN economy, the region will face increasing pressure to pull its weight in global efforts against climate change. This is not only from the EU and other trade partners but from the increased awareness of the ASEAN governments and peoples about the impacts of climate change.

ASEAN countries should therefore implement and strengthen carbon pricing policies to shift local industries towards low-carbon economic activity. In tandem with such efforts, at the least, ASEAN countries should push for future CBAM revenue from ASEAN exports to be allocated towards helping developing regions decarbonise. Finally, ASEAN regulators can and should move to implement carbon accounting requirements domestically. These pre-emptive actions would not only mitigate business and trade disruptions caused by an eventual EU CBAM implementation, but also put the region in a position to thrive in the greener global economy of the future.

As ASEAN moves forward with its own climate action plans and NDCs, there is a need not only for each of its members to act but for the region to act with greater coordination for efficiency and scale. Several ASEAN countries are in the process of implementing or considering national ETS policies. Ideally these schemes should be interoperable from the outset, both for synergy purposes and to avoid future friction as ETS policies may necessitate CBAM-like measures to avoid carbon leakage. As such, an intra-ASEAN discussion about climate policies and carbon pricing is necessary to augment national efforts. ASEAN regional cooperation can also serve to advance further dialogue with trade partners like the EU.

Annex: Literature Review

This paper was produced from a review of academic literature, research studies, and news reports on carbon border measures. Most of these resources focused specifically on the EU's CBAM proposal. It bears noting that academic research on the topic is still emerging, and most of the presently available studies have come mainly from developed countries. In contrast, analysis of the potential effects on developing countries, or on ASEAN countries, is currently limited.

On the prevalence of carbon leakage, Misch, Florian and Wingender (2021) built on previous empirical studies to demonstrate that leakage is significant, but that there are differences across countries based on openness to trade and country size. Recent literature on the channels of carbon leakage was also reviewed. Most papers identified the "competitiveness" and "energy markets" channels as the main contributors to carbon leakage (Arroyo-Currás et al., 2015). Other channels included the "induced innovation channel", which has been theorised although its empirical scope is lacking (Fischer 2015). This channel creates negative leakage in the long term, when innovation in cleaner technologies lowers their costs globally, increasing their attractiveness.

A handful of papers explored the effectiveness of a carbon border adjustment mechanism in mitigating the risk of carbon leakage. In general, there was a consensus that border adjustments were effective in reducing carbon leakage occurring through the competitiveness channel (Mörsdorf, 2021). Nevertheless, there were criticisms regarding its political feasibility and legal status under WTO law. Bacchus (2021) concluded that the WTO-compatibility of the EU's CBAM could be challenged on multiple fronts. This was supported by Marcu et al. (2020). The administrative burden that the CBAM regulation could potentially have on EU Member States was another point commonly mentioned in the literature (Lamy et al., 2020).

Given difficulties arising with carbon border adjustment measures, several papers advocating for alternative solutions were identified. Among the recommendations, output-based allocations or output-based rebates stood out (Quirion, 2021). Output-based solutions are often paired with consumption charges on industrial materials to address weakened price signals due to production subsidies (Sato, 2016, and Acworth et al., 2020). The literature also posited that output-based allocations would not be as politically contentious as a CBAM proposal, and therefore less likely to induce trade litigation at the WTO (Kaufman et al., 2020).

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