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Approaches for and challenges of recognising domestic payments

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Abstract: Third-country carbon pricing under the EU CBAM

In October 2023, the EU introduced a Carbon Border Adjustment Mechanism (CBAM) imposing a carbon price on imports of selected goods to the EU market. One question that arises for the implementation of the new instrument is how third-country carbon prices can be recognised and deducted from CBAM payments. The discussion paper presents two possible approaches: One that recognises carbon costs that are actually incurred, and another that uses carbon price averages of the country of origin. The first, the *actual payment approach,* simplifies the questions of how to account for free allocation of allowances or tax rebates, and how to deal with subnational systems. It puts the responsibility of providing evidence on the CBAM declarants who have an interest in achieving the recognition of their carbon costs incurred under a third-country instrument, while the other approach, the *average price approach,* assigns more responsibilities to the EU.

The discussion paper raises conceptual considerations and open questions regarding the technicalities of recognising third-country carbon prices, such as the treatment of multi-product installations or upstream carbon pricing instruments. It discusses challenges that are specific to the processes of cap-and-trade systems, tradable performance standards, and carbon taxes. A final recommendation on the design of the system for recognising third-country carbon pricing under the CBAM will not be developed as part of the paper. Instead, the paper aims to lay the general foundations for the process to establish binding EU rules, which is due to start in 2024 and to be finalised by the end of 2025 at the latest. The complexity of the issue, as analysed in this paper, implies that the EU will need a fair amount of pragmatism in designing the recognition procedure, keeping the regulatory burden manageable while at the same time effectively preventing carbon leakage. In the medium term, close cooperation with trade partners and pragmatic solutions to accommodate specific features of third-country systems could support a smooth implementation of the EU CBAM.

Kurzbeschreibung: CO_2-Bepreisung in Drittstaaten unter dem EU CBAM

Die EU hat im Oktober 2023 ein Grenzausgleichssystem (Carbon Border Adjustment Mechanism - CBAM) eingeführt, das einen CO_2-Preis auf Importe ausgewählter Produkte erhebt. In diesem Rahmen ergibt sich die Frage, wie mit der Anerkennung von CO_2-Preisen in Drittstaaten und deren Anrechnung auf die CBAM-Verpflichtungen umgegangen werden kann. Das Diskussionspapier betrachtet hierfür zwei Ansätze. Ein Ansatz setzt bei tatsächlichen Zahlungen von CO_2-Preisen an. Der andere Ansatz verwendet Durchschnittswerte von CO_2-Preisen in Herkunftsstaaten. Der erste Ansatz vereinfacht die Berücksichtigung von freien Zertifikatezuteilungen oder anderen Vergünstigungen sowie den Umgang mit subnationalen Systemen. Diese Methode überträgt den Nachweisaufwand auf die CBAM-Anmelder, die ein Interesse an der Anerkennung ihrer CO_2-Kosten in Drittstaaten haben. Der Durchschnittspreisansatz wiederum sieht den Nachweisaufwand stärker bei der EU.

Das Diskussionspapier analysiert konzeptionelle und technische Fragen der Anrechnung von CO_2-Preisen in Drittstaaten, wie den Umgang mit Anlagen mit verschiedenen Produkten oder mit Upstream-CO_2-Preisen. Es diskutiert spezifische Herausforderungen, die sich für diesen Prozess unter Emissionshandelssystemen und CO_2-Steuern ergeben. Eine abschließende Empfehlung zur Ausgestaltung des Systems zur Anrechnung der CO_2-Kosten in Drittstaaten für die Abgabeverpflichtung im CBAM wird im Rahmen des Papiers nicht entwickelt. Das Papier soll stattdessen zunächst die Grundlage für den 2024 startenden und bis spätestens Ende 2025 abzuschließenden Prozesses zur Festlegung verbindlicher EU-Regeln legen. Die im Papier erarbeiteten Erkenntnisse zeigen die Komplexität des Anrechnungsprozesses und verdeutlichen,

dass die EU eine pragmatische Umsetzung des Anerkennungsprozesses bei gleichzeitiger effektiver Verhinderung von Carbon Leakage anstreben sollte, um den regulatorischen Aufwand in Grenzen zu halten. Mittelfristig können eine enge Kooperation mit Handelspartnern und ein pragmatischer Umgang mit Eigenheiten spezifischer Drittstaatinstrumente dabei helfen, den EU CBAM reibungslos umzusetzen.

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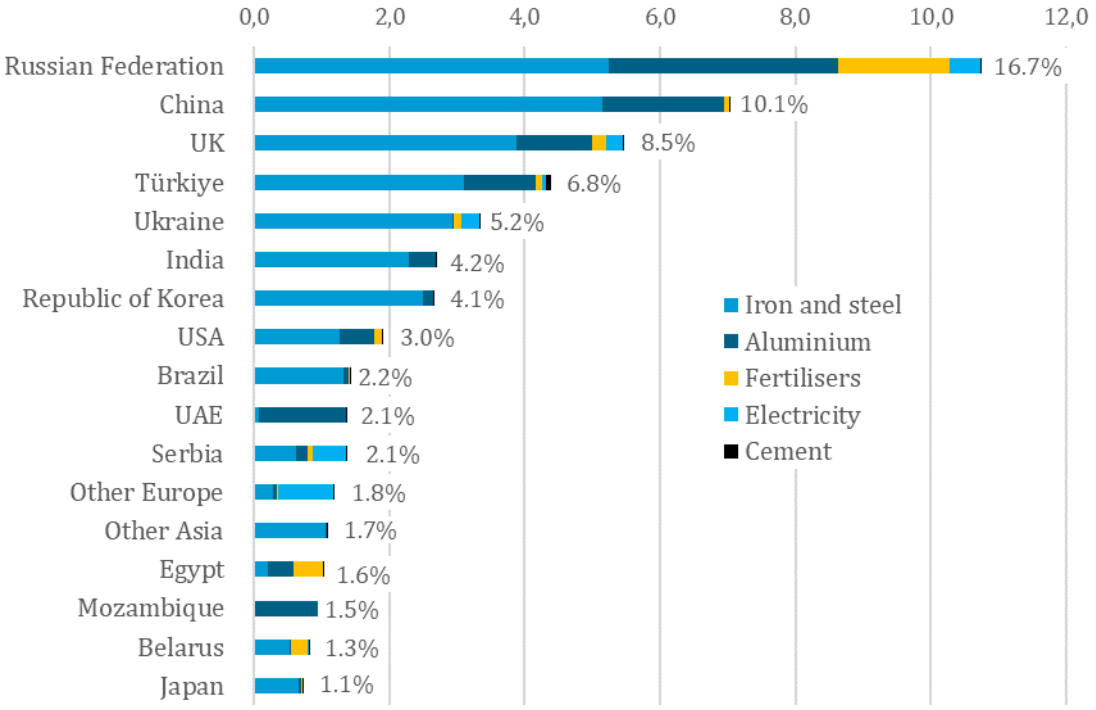
1 Introduction

1.1 Background: EU CBAM and third-country carbon prices

In April 2023, the EU adopted Regulation 2023/956 to introduce a Carbon Border Adjustment Mechanism (CBAM) to impose a carbon price on imports of selected goods to the EU market. The purpose of the new instrument is twofold: first, it shall protect EU industries from a loss of competitiveness on international markets caused by the phaseout of free allocation of allowances and the tightening of the cap in the European Emissions Trading System (EU ETS) likely leading to a higher EU carbon price. Thus, the EU CBAM aims to level the playing field with importers to strengthen global mitigation efforts and prevent carbon leakage. Second, the instrument aims to encourage the reduction of GHG emissions in partner countries and the enhancement of climate policy ambition more broadly. The EU CBAM mirrors the rules in place for domestic firms under the EU ETS. It is phased in with a transitional period starting in October 2023 during which no CBAM levy is charged, but reporting obligations apply. The first compliance cycle will start in 2026. CBAM initially covers iron and steel, aluminium, ammonia and fertilisers, cement, hydrogen, and electricity.

The instrument triggered a wide debate among the EU's trade partners – countries and companies – on how they will be affected by CBAM. Note that CBAM is not directed at countries, but at the importers and ultimately the producers in the countries of origin. Even though CBAM is addressing firms, the country in which the production of CBAM goods takes place is relevant as this determines if the producers are already subject to a domestic carbon price. Figure 1 shows the top exporting countries of products covered by CBAM, ranked by their share of total EU imports of those products (2015-2019 figures). In absolute terms, these are the countries in which producers will be most affected by CBAM. However, for some trading partner countries the EU constitutes a major market for CBAM products leading to a high relevance of the topic for firms there. Producers in EU neighbourhood countries, such as Ukraine or Türkiye, and some developing countries could be more challenged by CBAM than those large economies with a lower share of exports to the EU.

Figure 1: Top exporters[1] of CBAM goods to EU-27 (combined share of total EU imports of CBAM goods), annual average (billion USD), 2015-2019[2]



Source: Adapted from Chatham House (2021).

Article 9 of the CBAM Regulation states that importing companies can reduce their obligation to surrender CBAM certificates by accounting for costs incurred under a third-country carbon pricing instrument (CPI) covering the embedded emissions of CBAM products. Table 1 shows that among the top ten exporters of CBAM goods to the EU, only five countries have an explicit CPI in place. Out of those, only the United Kingdom has a CPI with a yearly average price that is comparable with the current allowance price level in the EU ETS (USD 83.10 in 2022[3]). China, South Korea, Ukraine, and some US states have systems with significantly lower price levels. Many CPIs have a smaller coverage than the EU ETS. The table depicts the status as of May 2023. It is likely that more countries and subnational jurisdictions will introduce CPIs in the near future. Türkiye, Ukraine, Brazil, India, and Sakhalin Oblast in Russia are examples from the table that are considering or already planning to introduce an ETS. These developments have accelerated in response to the EU CBAM as the instrument incentivises third countries to implement or strengthen domestic carbon pricing instruments. This allows them to redirect the flow of carbon price payments from the EU to domestic revenues.

[1] Excluding Norway, Iceland and Switzerland as they are exempted from the CBAM.

[2] The 2015-2019 annual average data predates the pandemic and associated disruptions in international trade for the years 2020 and 2021. The authors recognize that the share of imports from Ukraine and the Russian Federation to the EU has been significantly reduced due to the Russian invasion of Ukraine in 2022, while other countries have filled the gap by increasing their exports to the EU (e.g., Canada).

[3] ICAP (2023).

Table 1: Top 10 exporters[4] of CBAM goods to the EU-27 and explicit CPIs covering CBAM sectors

Exporting country	Explicit CPI in place (2023)	Coverage of CBAM-relevant sectors	Average carbon price[5] in 2022 [USD/t CO2e]
Russian Federation	None	-	-
China (incl. regional pilot systems)	ETS (cap-and-trade system)	Industry	Chongqing: 4.26 Guangdong: 11.35
	Intensity-based ETS	China National ETS: electricity Regional pilots: industry	China National ETS[6]: 8.20 Beijing: 17.44 Fujian: 3.37 Hubei: 6.43 Shanghai: 5.90 Shenzhen: 6.45 Tianjin: 5.10
United Kingdom	ETS (cap-and-trade system)	Industry, electricity	92.96
Türkiye	None	-	-
Ukraine	Carbon tax	Industry, electricity	1.00
India	None	-	-
Republic of Korea	ETS (cap-and-trade system)	Industry, electricity	17.99
USA	On the subnational level: ETS (cap-and-trade system)	California, Washington: industry, electricity Massachusetts, RGGI: electricity Oregon: industry, electricity (upstream)	California: 28.08 Washington: 56.01 (May 2023) Massachusetts: 8.17 RGGI: 13.46 Oregon: not publicly available
Brazil	None	-	-
United Arab Emirates	None	-	-

Source: Chatham House (2021), ICAP Status Report 2023.

1.2 Framework set by the CBAM Regulation

The CBAM Regulation provides a general framework to account for third-country carbon pricing but delegates the drafting of the details to the European Commission (to be adopted as implementing act, that is, with participation of the Member States). Article 3 (29) of the CBAM

[4] Norway, Iceland, and Switzerland are not included in this table as they are participating or have an ETS that is linked to the EU ETS.

[5] For jurisdictions with ETSs in place: average auction price (where available) or average secondary market price.

[6] The China National ETS currently covers only the power sector. Industrial sectors including producers of CBAM goods are covered by the regional pilots and should be gradually transferred to the national ETS.

Regulation provides a legal definition of eligible carbon prices for a reduction under CBAM:

"'carbon price' means the monetary amount paid in a third country, under a carbon emissions reduction scheme, either in the form of a tax, levy or fee or in the form of emission allowances under a greenhouse gas emissions trading system, calculated on greenhouse gases covered by such a measure, and released during the production of goods;"

We interpret this definition in a way that exclusively considers mandatory compliance systems with an explicit carbon price. Explicit carbon pricing instruments apply a price that is proportional to the GHG emissions associated with a given product or activity. Carbon taxes and ETSs are the most common types of explicit carbon pricing instruments. In contrast, implicit carbon pricing refers to policies and measures that have an impact on the relative price of carbon-intensive goods or services compared to less carbon-intensive alternatives without putting an explicit price on emissions. These include emission standards, subsidies, feed-in tariffs for renewable energy sources, and energy taxes, such as excise taxes on fossil fuels. We interpret the CBAM regulation in a way that these implicit measures cannot be recognised. Likewise, we interpret "carbon emissions reduction scheme" as only covering mandatory compliance systems and no voluntary compensation of emissions in the form of offsets that firms might acquire both in the third country or on the international carbon market.[7] The implementing act on the process of the recognition of third-country carbon prices will have to specify under which conditions domestic carbon costs are eligible for deduction.

Article 9 (1) grants CBAM declarants a right to claim a reduction in the number of certificates to be surrendered corresponding to the carbon price *effectively paid* for the embedded emissions of imported CBAM goods in another jurisdiction. In order to claim any deductions from CBAM obligations based on the carbon price paid in the country of origin, the CBAM declarant will have to provide evidence of the price effectively paid. According to Article 9 (2) of the CBAM regulation, the CBAM declarant will be required to keep records of the documents demonstrating that embedded emissions in imported CBAM goods were subject to a carbon price in the country of origin, the evidence of the actual payment and the evidence of any applicable rebates or other forms of compensation. Information on rebates shall be certified by an independent person (Article 9 (2)), and qualifications and conditions to prove its independence shall be further specified by the Commission in an implementing act. The types of acceptable evidence of the actual payment will also be specified in the act. The conversion of the yearly average carbon price effectively paid into a corresponding reduction of the number of CBAM certificates is yet another detail, along with currency conversion rules (Article 9 (4)), that will be further elaborated by the Commission.

We identify two possible approaches to interpret the notion of "effectively paid" from Article 9 of the CBAM Regulation: the average (carbon) price approach and the actual payment approach. The ***average price approach*** assumes an average carbon price levied in the respective jurisdiction in a predefined period that can be deducted from the price of the CBAM certificates to be purchased by the declarant. This average price needs to be adjusted for any type of free allowances, tax rebates, or similar compensatory mechanisms. "Effectively paid" refers in this sense to the consideration of applicable deductions that need to be taken into account for the recognition of third-country carbon prices under CBAM.

The ***actual payment approach*** understands effective payment literally: any recognition of third-country carbon prices needs to be linked to an actual payment made by the producer

[7] Delbeke and Vis (2023) argue differently.

under a domestic carbon pricing regime. Compensatory mechanisms are implicitly accounted for as they do not involve an actual payment.

Neither the provisions in Article 9 of the CBAM Regulation nor the implementing act on CBAM monitoring and reporting[8] clearly indicate which of the two approaches aligns with the EU's understanding of an "effectively paid" carbon price. As of September 2023, this is still to be determined by the Commission. Note that the two approaches represent two opposite interpretations of Article 9. The final regulation could opt for a hybrid approach combining elements of the two approaches.

1.3 Aim and structure of this discussion paper

The discussion paper sheds light on how the legislative gaps and open questions regarding the practical implementation of third-country carbon price recognition under the EU CBAM could be addressed. The next section outlines a general methodology of how third-country carbon prices can be accounted for under both the actual payment approach and the average price approach. The scope of the paper is limited to providing a first sketch of the two approaches that needs to be adjusted to specific cases in a further step. In section 3, we discuss conceptual and implementation challenges arising from the recognition of third-country carbon prices under CBAM and options for tackling them. Some of the analysed challenges are independent from the specific approach applied for recognising third-country carbon prices, and others change depending on whether the actual payment or the average price approach is used. General challenges that we discuss are, for instance, the treatment of upstream systems and the recognition of offsets. Approach-specific challenges are, for instance, dealing with multi-product installations for the actual payment approach or the treatment of subnational systems for the average price approach. Most challenges arise under any approach for recognition but with different interpretations and implications for the specific approach.

Then, section 4 analyses how the recognition of third-country carbon prices could be implemented for cap-and-trade systems, tradable performance standards, and carbon taxes, and it highlights which instrument-specific challenges may arise. And finally, section 5 presents a brief outlook.

The paper cannot address all special cases that could occur. Nor can it solve all outlined problems to full satisfaction. Moreover, we exclude carbon prices paid for emissions from electricity and heat used as input for the production process from our analysis since it is technically challenging[9] and hence beyond the scope of this contribution, though the EU CBAM does cover these emissions for cement and fertiliser products.

The discussion paper further limits its analysis to the question of recognising third-country explicit carbon pricing under the EU CBAM. There are related questions and challenges that arise from the introduction of CBAM in general. For instance, CBAM requires the establishment of a framework for monitoring, reporting, and verification (MRV), a complex endeavour that can be challenging for countries without installation-based MRV systems in place. Where there is already a domestic MRV system in place because of a domestic carbon pricing instrument, MRV compliance for CBAM could build on this. However, this could require the alignment of both systems. The analysis of these general challenges is outside the scope of the paper. Because these questions interact with the process of recognising third-country carbon prices,

[8] See European Commission (2023).

[9] Some EU Member States take on the endeavour of calculating carbon costs induced by carbon-price related electricity price increases for their payments under the EU ETS electricity price compensation for energy-intensive industries.

implementing or delegated acts refining other aspects of the CBAM regulation will influence the issues raised in this paper.

Where useful, we provide examples of specific carbon pricing instruments and how their design interacts with the recognition of carbon costs under CBAM. The main EU trade partner countries and their CPIs, as identified in Table 1, deserve a special focus here, but we will also draw attention to instruments implemented by other trade partners.

A final recommendation on the design of the system for recognising third-country carbon pricing under the CBAM will not be developed in this discussion paper. The paper intends to lay initial foundations for the process to establish binding EU rules, which is due to start in 2024 and to be finalised by the end of 2025 at the latest.

2 Third-country carbon prices under CBAM

2.1 General considerations

There are some general considerations that make the process of recognising carbon costs incurred in third countries under CBAM a challenging endeavour. One of these is that CBAM does not regulate the producing installation, but rather either the EU-based importer of CBAM goods or an indirect customs representative (usually a different company). CBAM therefore does not directly impose additional costs on the producer in the third country. It *indirectly* affects the competitiveness of their export goods, as the costs for the importer, i.e., the buyer of the product, increase by the applicable CBAM charge levied at the border. The idea of recognising third-country carbon prices implicitly assumes that these costs are passed through to the importing company and that there should be no double carbon pricing.[10]

From the perspective of the importer, it should not make an economic difference if the producer paid a domestic carbon price or not. The importer would have to pay a higher purchase price for the good but could later reduce the CBAM payment by the incurred carbon costs. For goods that were not subject to a third-country carbon price, the importer would in turn need to pay the full CBAM obligation. From the perspective of the producing installation, the recognition of domestic carbon costs secures its competitiveness on the EU market vis-à-vis producers from countries that do not pay a carbon price.

The difference between the importer as a regulated entity under CBAM and the producer as an emitter being responsible for the subject of regulation requires a flow of data between the two which increases in volume to provide evidence of third-country carbon prices. The producer will need to collect necessary data to be processed by the importer. Both parties will need to agree on measures for data protection. We will touch upon the topic of data requirements in several of the specific challenges identified in section 3.

Further, the EU CBAM establishes a system of monitoring, reporting, and verification of emissions that is initially separate from third-country MRV systems.[11] Hence, while a lot of information needed to recognise third-country carbon prices is already available, differences in methodologies might cause a situation in which importers are not able to use the available data, for instance because it is not comparable to what is required under the EU CBAM. This might cause additional effort for regulated installations.

2.2 Average price approach

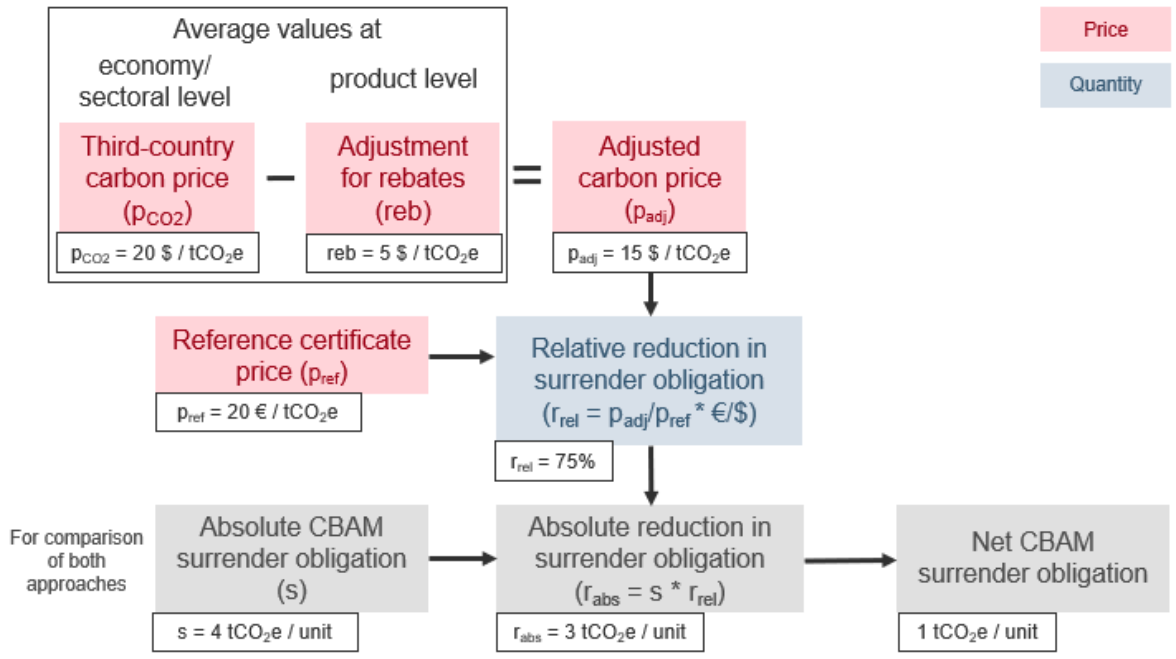
This section develops what we termed average price approach for the recognition process of third-country carbon prices under the EU CBAM. The approach is based on the average carbon price levied in a respective jurisdiction. EU authorities would determine this average price for a CBAM compliance period and allow declarants to deduct it from the price of the CBAM certificates if the imported good has been subject to the domestic carbon price in this jurisdiction. The assumed average price reflects the effective payment in the sense that it is reduced by any type of free allowances, tax rebates, or similar compensatory mechanisms existing in the respective jurisdiction.

[10] The exact level of cost pass-through is subject to price negotiation between the producer and importer and hence not possible to effectively verify. Consequently, any approach needs to assume complete cost pass-through.

[11] Existing third-country monitoring and reporting methods can be used until end of 2024 if their use leads to a similar coverage and accuracy of emissions data compared to the methodologies provided in Annex III to the implementing regulation (European Commission 2023).

Figure 2 depicts the main steps for the average price approach. The average carbon price (p_{CO2} in \$ per tCO_2e, where \$ represents a foreign currency) could be calculated economy-wide or for individual sectors (e.g., the average carbon price paid for emissions arising from the production of steel in Türkiye). Average values for available rebates and compensations in a specific country of origin (in \$ per tCO_2e) would need to be product specific. For instance, a simple precursor product like ammonia might receive full compensation under a third-country carbon price, while for a more complex product like ammonia nitrate a substantial share of the carbon price might be charged. Under a third-country ETS, the benchmark used for free allocation of allowances could be applied to determine the average rebate. A challenge in this process is that quantity compensations would need to be converted into an equivalent carbon price reduction. The applicable average carbon price minus the adjustment for rebates and compensations is then the adjusted carbon price (p_{adj} in \$ per tCO_2e) that is recognised as the third-country carbon price for the imported CBAM product. In the next step, the adjusted carbon price would be converted into a relative reduction in the surrender obligation (r_{rel} as a share of certificates) with the help of a reference price for CBAM certificates (in € per tCO_2e). This step would entail a currency conversion between the third-country carbon price (in foreign currency \$) and the CBAM reference price (in Euro). This relative reduction in the surrender obligation can in a last step be multiplied with the absolute CBAM surrender obligation per product unit to obtain the absolute reduction in surrender obligation (r_{abs} in tCO_2e or certificates) through the recognition of third-country carbon prices.

Figure 2: Recognition of third-country carbon prices under the average price approach



Source: own illustration, adelphi research.

The advantage of the average price approach is that it entrusts the EU to interpret the recognition of third-country carbon prices. No evidence from third-country producers is strictly needed, which reduces the effort for EU trade partners. However, there are two main disadvantages of the approach. First, it requires extensive ex-ante calculations of the average carbon price for individual eligible systems and an in-depth understanding of applicable rebate mechanisms. This requires a considerable effort from EU authorities to understand third-country systems. These calculations would need to be updated for every CBAM compliance

period to adjust for any change in regulation that might have taken place since then. EU authorities would need to be in constant exchange with third-country authorities, including authorities on subnational levels responsible for regional CPIs, to ensure their understanding of the applicable regulation aligns.

The second disadvantage of the average price approach is that it would assume an average carbon price per tCO_2e for all products from a given jurisdiction, generating a potential gap between the carbon price actually paid by a producer and the recognised carbon price under CBAM. This procedure would be unfair for those producers that either benefit less from compensation schemes or paid above-average prices when acquiring their allowances.

Alternatively, producers could be required to provide evidence of any rebates or carbon cost compensations they received. The problem here is that producers would not have an incentive to provide correct information. They might not even be able to do so, as this would also include information on rebates or compensations provided to producers of CBAM regulated precursors of their products. In the latter case, the effort of compliance checks for CBAM authorities and the risk of circumvention could potentially be significant.

2.3 Actual payment approach

The actual payment approach is an alternative to the average price approach for the recognition process of third-country carbon prices under the EU CBAM. The approach links the recognition of third-country carbon prices to evidence of actual payments made by producers under a domestic carbon pricing regime. The advantage of this approach is that it does not require ex-ante calculations of the average carbon price for individual eligible systems or an in-depth understanding of applicable rebate mechanisms, which would be imperative under an average carbon price approach. The actual payment approach assigns the responsibility for providing evidence for the domestic payment to the declarant and, by extension, the producing installation. If the declarant wants incurred carbon costs to be recognised under CBAM, it needs to provide the relevant information on actual payments made by the producer. In this way, the actual payment approach is fair as only proven carbon costs are accounted for.

Under the actual payment approach, the effectively paid carbon price refers to actual payments under a third-country carbon pricing instrument (after potential free allocation of allowances, tax rebates or other deductions). While the paid carbon price can stem from any type of explicit carbon pricing instrument and can be collected both at point source or upstream, the recognition process described below assumes a simple case in which the domestic carbon price is paid at installation level,[12] i.e., at point source. If an example installation produces a single good, all emissions occurring in this installation can be attributed to the CBAM good. This simple case will serve as basis to discuss more complex cases in section 3.

The compliance obligation for declarants is defined in CBAM certificates to be surrendered for the emissions embedded in the imported goods (not in terms of a monetary payment). Correspondingly, a reduced obligation based on incurred carbon costs in a third country must take the form of a reduction in the number of CBAM certificates to be surrendered.

[12] In some systems, the carbon price is paid at company level. In this case, the regulated company needs to provide evidence of how carbon costs break down to individual installations.

The corresponding reduction of CBAM certificates to be surrendered by the declarant per tonne of product is determined in two steps:

Step 1: from installation level to product level

In a first step, installation-level data on carbon costs needs to be converted into product-level data, as CBAM is charged on embedded emissions per unit of imported product. The aggregate amount of carbon costs effectively incurred by the installation within the compliance period of the domestic system is divided by the quantity produced during the same period. The result is the product-level carbon costs ($/product unit) incurred by the installation in the compliance period. At this stage, it is irrelevant if the product is exported or sold domestically.

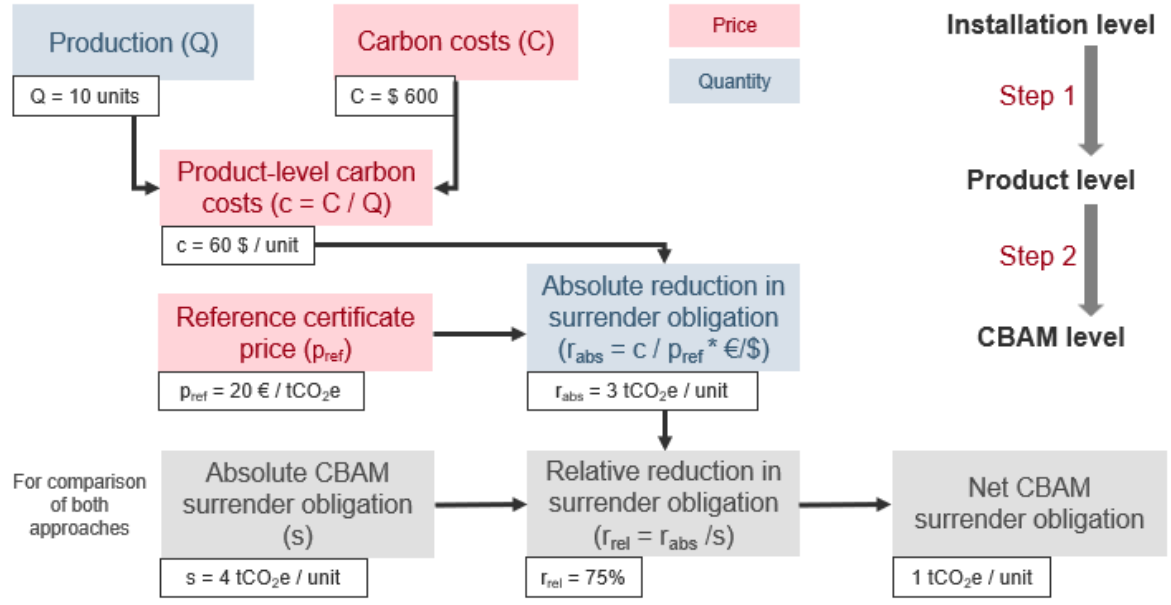
Step 2: from product level to CBAM level

The product-level carbon costs ($/product unit) are divided by a CBAM reference price (€/tCO_2e)[13] to derive the absolute reduction in the surrender obligation (r_{abs} in tCO_2e/product unit). This step includes a currency conversion between the paid carbon costs (in foreign currency $) and the CBAM reference price (in Euro). The absolute reduction r_{abs} can be subtracted from the applicable product-level surrender obligation of the declarant.

To compare the actual payment with the average price approach, the ratio of the absolute reduction r_{abs} and the absolute CBAM surrender obligation s yields the relative reduction in surrender obligation r_{rel} used in the average price approach.

Figure 3 presents a graphical illustration of the actual payment approach to recognise third-country carbon prices under the EU CBAM including an example calculation.

Figure 3: Recognition of third-country carbon prices under the actual payment approach



Source: own illustration, adelphi research.

[13] The reference price is an average price for the certificates the declarant bought under CBAM needed for the calculation. The methodology for determining the applicable reference price of CBAM certificates for the recognition of third-country carbon prices is still to be defined by the Commission in an implementing act (see subsection 3.4 for options).

The visualisation highlights a main challenge of the recognition of third-country carbon prices: the combination of price and quantity data. While a third-country carbon price refers to a monetary value, the CBAM obligation accrues in a quantity of emissions certificates. The complexity of converting a price into quantity values is a feature in both the average price and the actual payment approaches.

Table 2 provides an overview of the two outlined approaches:

Table 2: Comparison of the two approaches towards recognising third-country carbon prices

	Average price approach	Actual payment approach
Calculation based on	Economy-wide or sectoral average carbon price	Actual carbon price payment for a product regulated under CBAM
Evidence provided by	EU authorities	Declarant and, subsequently, producers in third countries
Administrative effort	High for authorities in the EU and in third countries	High for producers of CBAM goods and declarants
Fairness	Some producers benefit from average values, others lose	High fairness as it is based on actual values
Risk of fraud	Low as EU authorities maintain control over the recognised carbon prices High if producers and declarants provide evidence for domestically received compensation	Medium as producers and declarants are required to provide evidence in accordance with CBAM reporting rules

The two approaches represent extreme cases. For a practical solution, a hybrid approach combining different elements might be recommendable. For instance, one option could be to implement the actual payment approach using average values wherever providing actual data is not technically feasible or imposes high administrative costs for declarants or third-country producers. This is explored in more detail in section 4.1.

3 General considerations and open questions

The price recognition process described in section 2 becomes more complicated when applied to real world conditions. This section discusses conceptual and implementation challenges that need to be addressed under each approach as well as challenges in recognising third-country carbon prices in general, regardless of the chosen approach.

3.1 Multi-product installations

While this is not a problem for the average price approach, the **actual payment approach** becomes more complex if installations produce several outputs, including products not regulated under CBAM. Let us consider an illustrative example of an integrated production facility that produces ammonia as a precursor; and from the ammonia – fertilisers (ammonia nitrate) and explosives. Ammonia and fertilisers fall under the EU CBAM, but explosives do not. Let us further assume that all emissions from the installation are covered by a domestic carbon pricing instrument and the carbon costs accrue at installation level.

Determining product-level carbon costs for different products in this case would require an additional step in which installation-level carbon costs are attributed to products. This is necessary, as different products have different emission intensities, and we should not attribute carbon costs uniformly to different products. The attribution of product-level carbon costs should take place regardless of the share of goods regulated under CBAM and exported into the EU – essentially, it would be important to avoid situations in which carbon costs paid for the total production at an installation are disproportionately counted towards reductions in CBAM costs for the production share exported to the EU. In our example, the carbon costs paid for the production of explosives should not be attributed to the ammonia production.

Attributing carbon costs to product groups would start from attributing installation-level emissions to each product type based on the emissions of the different production processes. Wherever this approach would not do justice to the actual attribution of carbon costs (for instance if there are separate carbon prices for electricity and fuels), the installation can provide additional information to prove this. This step is based on data reported under the domestic carbon pricing instrument. CBAM requires only reporting of emissions caused by the production process of the CBAM good (see Annex IV of the CBAM Regulation). The verification report to be submitted as part of the CBAM declaration should confirm the correct attribution of carbon costs to the CBAM products.

Annex VI of the CBAM Regulation states that the verification report shall include information on the total amount of each product type (declared and non-declared) produced in the reporting period (that is, how much ammonia, ammonia nitrate [fertiliser] and explosives were manufactured) and the total direct emissions of the installation. The verification report should also explain how installation emissions are attributed to each product type. Essentially, it will not matter if the installation produces goods not covered under the EU CBAM (explosives in our case) – data on the facility's total production and total emissions shall, according to the CBAM regulation, be compiled, verified, and provided to the CBAM authority.

The provisions in Annex VI, however, refer to emissions under the scope of CBAM. To be consistent, carbon costs should be attributed according to emissions reflecting the scope of the domestic carbon pricing instrument. For a pragmatic solution, it might be helpful to allow producing installations to attribute carbon costs to the different products using either emissions under the CBAM scope or the domestic CPI.

While the procedure of attributing carbon costs to individual CBAM products is complex, the necessary data is available: Installations will need to report installation level emissions under the domestic CPI. Data on emissions of production processes of individual products regulated under CBAM can be provided by the domestic CPI or the CBAM MRV. Installation-level carbon costs can be attributed to individual CBAM products by applying the share of product-level emissions to the total emissions of the producing installation.

The complexity of the procedure is caused by the endeavour to accurately determine product-specific carbon costs under the actual payment approach. Assuming an average carbon price in the domestic system would simplify this step.

3.2 Multi-installation products

In many cases products to be declared under CBAM are not fully manufactured at a single installation, but their production stages are scattered across facilities within one or different jurisdictions. Going back to our example in 3.1, ammonia nitrate, a fertiliser to be imported to the EU, might be manufactured at a single installation, but ammonia, a precursor for its production, would be produced at another installation or imported from a third country. A certain carbon price might have been paid by the ammonia manufacturer, either under the same carbon pricing scheme or, when a precursor is imported from another jurisdiction, under a different scheme. In both cases, the carbon price paid for emissions from precursors manufacturing should be deducted from the CBAM obligation in order to put such a product on an equal footing with a product manufactured at an integrated facility. This holds for complex goods in line with the CBAM regulation. For these, precursors contribute to embedded emissions and thus to the obligation to surrender CBAM-certificates. For the **actual payment approach**, this implies that the producer of a precursor should be willing and able to provide a type of payment evidence, recognised under the CBAM regulation, to the producer of the good to be declared under CBAM.[14]

The challenge of the actual payment approach is to determine the exact product-level carbon cost incurred. This is even more challenging in the case of precursors. A verification report under the CBAM declaration shall contain information on input quantity and associated embedded emissions of each precursor (Annex VI of the CBAM regulation) but not the information on total production level or total emissions of the installation producing the precursor that would be needed for calculating product-level carbon cost incurred. This is likely confidential information. However, as the approach assigns the responsibility for providing evidence to the importers, they can negotiate disclosure of this additional information with their suppliers who would themselves pass this on to their suppliers. Alternatively, the importers can forego the recognition of carbon costs incurred. A full list of precursors falling under the scope of the CBAM was determined by the Commission in Annex II to the implementing act for the transitional phase of the EU CBAM (European Commission 2023). The challenges for multi-installation products are both demanding on the conceptual and the implementation level.

The treatment of multi-installation products is less challenging under the **average price approach**. If inputs for the CBAM good were produced in another country with no or a different carbon price, a weighted average of the carbon price for the emissions of the input product and the emissions from the product finishing would need to be constructed.

[14] This is only relevant for precursors covered by the EU CBAM.

3.3 Availability and reliability of data provided in the CBAM declaration

Both approaches for the recognition of third-country carbon prices have specific but different data requirements. The **average price approach** requires data that does not officially exist so far. CBAM declarants are required to report their effectively paid carbon price. It is however not straightforward how to calculate this carbon price. The EU Commission would need to determine a methodology for each type of carbon pricing instrument. For a carbon tax, the average carbon price of a country is easy to determine. It only increases in complexity for certain special cases, for instance if the EU will only accept emission equivalent to the CBAM scope, as discussed in 3.7, or if the tax accepts carbon offsets, as discussed in 3.8. Under an ETS, there is no official standard on how to determine an average carbon price. We discuss this case in detail in 4.1.1.

The **actual payment approach** requires a range of installation-level data, going beyond the data related to the declared products. While not a substantive conceptual challenge, availability and reliability of data provided in the CBAM declaration will be challenging in terms of technical implementation. The CBAM regulation requires most of the needed data as part of the CBAM declaration or a verification report (Articles 6 and 8). The verification report shall, for example, contain data needed for calculating the product-level carbon-cost ($/unit of product), such as quantities of each type of good produced at an installation (see Annex VI, 2 g and i). It is yet to be clarified by the Commission how the carbon costs effectively incurred by the producing installation shall be reported under CBAM and what type of evidence will be accepted (see section 1.2).

Operators of third-country installations will be able to voluntarily register in a CBAM registry that should facilitate the provision of verified data between the installations and the CBAM declarants (Article 10 (2) and 14 (3)). Operators can disclose verified emissions reports to the CBAM declarants importing their products (Article 10 (7)). While not specified in the CBAM regulation, the registry could also contain information on product-level carbon costs incurred in the third country.

One challenge arises in the case of systems with company-based instead of installation-based compliance obligations such as the Korean ETS or the Chinese provincial ETS pilots. For example, in the Guangdong pilot ETS, each regulated company has only one MRV system account, one registry account, and one trading account. If the company has several covered installations, it will be challenging for them to report carbon costs directly related to a specific installation as the purchase and surrendering of allowances is taking place at company level. In such cases, a proportional distribution of carbon costs between one company's installations based on installation-level emissions would be a feasible way to address this complication.

Also, CBAM compliance authorities will need to reliably check what carbon price has been effectively paid by an installation in a third country. For this, an importer of a CBAM good would need to provide evidence to the CBAM compliance authority of the actual carbon price payment (Article 9.4).[15] This evidence must be certified by a person, independent from the authorised CBAM declarant and the government of the country of origin (Article 9.2).

Furthermore, it would be necessary to include a statement by the declarant that all evidence is provided, and the competent authority will be informed on any subsequent changes to the content of the CBAM declaration. For instance, if a third-country system allows for ex-post rebates or reimbursements of the carbon price, these may occur after the CBAM declaration was submitted and the declarant needs to inform the competent authority on this. For an in-depth

[15] This is particularly challenging for emissions trading systems. We discuss this in detail in section 4.1.

discussion of approaches to establish the level of carbon costs effectively incurred by installations under cap-and-trade systems see section 4.1.

3.4 Determining the reference price of CBAM certificates

The CBAM regulation sets out that the price of CBAM certificates should reasonably reflect the fluctuating market price of allowances under the EU ETS and should therefore be determined *"through averages calculated on a weekly basis"* (Article 21). These values serve as spot prices for CBAM certificates. The recognition of third-country carbon prices requires a reference price for CBAM certificates. Because CBAM certificates can be purchased at different times, it is not clear how this reference price will be determined as the regulation does not specify this. Determining the method to derive a reference price poses only a light conceptual and implementation challenge. There are several options:

1. The current market price of CBAM certificates on the day of submission of the CBAM declaration;

2. The yearly average market price of CBAM certificates for the current compliance period; or

3. The weighted average price paid by the declarant for CBAM certificates that have been purchased during the current compliance period.

The first two options would allow to have a single reference price of CBAM certificates for all declarants, while the third option would mean using different prices for each declarant, adding an administrative hurdle but reflecting true carbon costs and, hence, increasing fairness. The higher the reference price used for calculation, the lower the reduction in the surrender obligation is.

The determination of the reference price of CBAM certificates is one of the issues that needs to be addressed regardless of the approach chosen to calculate the effectively paid carbon price. This is due to the necessary conversion of the (monetary) amount of carbon price effectively paid under a third-country system, determined through either of the two approaches, into a corresponding (quantitative) reduction of the number of CBAM certificates to be surrendered by the declarant. Both the average price and the actual payment approach require determining a reference price of CBAM certificates to calculate the applicable reduction in surrender obligation for the payment of a third-country carbon price.

3.5 Upstream systems

Another general question of third-country carbon price recognition under CBAM is whether upstream carbon pricing instruments are accepted. This question is independent of the chosen approach. Examples of such upstream systems are the New Zealand ETS, Oregon's Climate Protection Program (USA), Nova Scotia's cap-and-trade system (Canada), and the carbon taxes in Mexico, Colombia, Uruguay, and Argentina.

Carbon costs that occur upstream can only be recognised if they are passed through from the contributor to an upstream carbon pricing instrument (e.g., the fuel distributor) to the producer of the CBAM good. In practice, the regulator can only assume perfect or no cost pass-through, as the price along the value chain is negotiated and confidential. It is consistent to assume perfect cost pass-through as any recognition of third-country carbon prices assumes cost pass-through from producers to CBAM declarants. Upstream carbon prices should consequently be equally considered under CBAM, assuming 100% cost pass-through. In this case, a carbon tax charged at fuel distributor level counts as carbon costs for the producing installation.

Under the **average price approach**, the recognition of upstream carbon costs is simple as the point of regulation does not play a role for determining the average price. In fuel-based carbon pricing instruments, the recognition of carbon costs can be based on the fuel input per tonne of the CBAM good from the emissions report. Under the **actual payment approach**, recognising upstream carbon prices might add a level of complexity to the required documentation of payments. The producer would need to provide the receipt of its fuel distributor showing the carbon price charged on the delivered fuels as well as the amount of fuel purchased. Providing this type of evidence becomes more challenging if several agents along the distribution chain are involved. Overall, the treatment of upstream systems poses medium conceptual and technical challenges for their recognition under CBAM.

3.6 Subnational systems

One open question for the recognition of third-country carbon prices is how to treat subnational policies. The US, for example, does not have a federal CPI. Instead, there are a number of state-level instruments. This does not constitute a challenge under the **actual payment approach**, which recognises effective payments regardless of the CPI under which the payments were made. The **average price approach** could pursue two different paths: It could apply a country-wide average price. Then, it would need to use weighted averages of carbon prices in all subnational jurisdictions with a carbon price of zero for subnational entities without a carbon price. This would imply that only a part of actually paid carbon costs of producers in, for instance, California is recognised. More reasonable and closer to the actual payment approach would be not to apply country-level but system-level average prices. A declarant would then need to provide evidence that a producing installation is regulated under a state-level CPI. This would add another layer of effort for the CBAM authorities. Countries like Canada, China, or Mexico have various subnational CPIs, and the EU would need to determine an average carbon price as well as a product-specific average rebate for each of them every year.

3.7 Compatibility of systems' scope

It is likely that third-country systems differ from the EU ETS in their scopes. A system might price emissions outside the scope of the EU ETS and hence CBAM, for instance, methane emissions in ammonia production. An example is the New Zealand ETS, which covers more greenhouse gases than the EU ETS (incl. methane). Similarly, CBAM does not consider indirect emissions from electricity consumption for aluminium, iron and steel, and hydrogen for which producers in other systems pay a carbon price, e.g., in the Korean ETS.[16] The question arises if a carbon price paid for these emissions should be considered under the EU CBAM. This question is independent of the chosen approach.

If we think about the EU CBAM mirroring regulation of EU firms to their competitors in third countries, we will conclude that these emissions should not be considered. If we, however, take a competitiveness perspective, one could argue for considering these carbon costs, especially if European firms do not pay them. Allowing for their deduction levels the playing field for competitors in this case.

Recognising these carbon costs should not pose a high burden in terms of implementation, as installations will need to show evidence of emissions and payments corresponding to their other carbon costs. A minor challenge might occur regarding the MRV framework of emissions outside

[16] EU ETS installations indirectly pay a carbon price for electricity. In some countries, electricity-intensive sectors receive a compensation payment for ETS-induced electricity price increases which is why electricity emissions in those sectors are exempted from CBAM.

the EU ETS scope if there is no equivalent EU procedure, for instance for emissions from methane leakage. It is, however, not necessary to understand and approve the MRV framework of the third-country system as the actual payment is what matters.

3.8 Treatment of domestic or international offsets

Some carbon taxes and ETSs allow for domestic or international offsets to be used for compliance (see Table 3). It is yet unclear if costs incurred through the purchase of carbon offsets for compliance under a domestic carbon pricing instruments are eligible for recognition under the CBAM. This poses a conceptual challenge for the involved EU authorities to solve. On the one hand, the CBAM regulation does not mention offsets at all, and carbon credits from voluntary crediting schemes are not listed among forms of carbon price recognised under CBAM (Article 3 (23)). Also, for entities regulated under the EU ETS, offsets have not been allowed for compliance since 2021. If the EU CBAM aims to mirror EU ETS regulation, offsets should accordingly not be recognised.

On the other hand, from a level playing field perspective, it would not matter whether a third-country producer pays a carbon price under a domestic ETS/tax or in the form of offsets that can be used for compliance. Under the **actual payment approach**, the price of offsets bought during the compliance period could count towards the total installation-level carbon cost. **The average price approach** could not distinguish between offset credits and allowances under a third-country ETS. The use of offsets is at least partially reflected in the price for allowances. If offsets are allowed, the allowance price will be lower because it broadens the abatement options for regulated entities. If there is no limit on the use of offsets, the allowance price would converge towards the offset price. Most ETSs hence impose a quantitative limit. In this case, an average price approach relying on, for instance, the auction price would likely overestimate the average carbon price in the system. Under a carbon tax, offsets could be seen as rebates in the sense that the difference between the carbon tax and the offset price technically constitutes the rebate. It would be challenging to determine the level of the rebate, that is, the average price of the offsets. For a domestic offset system, a trading platform might calculate average prices.

Quality of offsets would be another issue – any offset costs recognised under CBAM that do not lead to a reliable long-term carbon emission reduction would undermine the scheme. Necessary provisions for considering offsets and setting up quality criteria would need to be included in the CBAM regulation. International offsets will most likely not be eligible, as the CBAM regulation explicitly states that any reduction can be claimed only if the carbon price has been effectively paid *in the country of origin* (Article 9 (1)). Domestic offsets likely are subject to more stringent quality criteria and compliance checks than international offsets, as they are directly contributing to the emissions reduction targets of the respective jurisdiction.

Table 3: Treatment of offsets in selected third-country CPIs

Jurisdiction	Explicit domestic CPI in place	Type of offsets accepted for compliance	Maximum share of offsets accepted for compliance
Australia	Baseline-and-credit system on the national level	Domestic	Unlimited
Canada	ETS (Cap-and-trade system) and tradable performance standards (intensity-based ETS and baseline-and-credit system) on the subnational level, carbon tax (fuel charge) and intensity-based ETS (OBPS) on the federal level	**Nova Scotia**: domestic and international[17] **Québec**: domestic (and WCI)	**Nova Scotia**: - **Québec:** 8%
Chile	Carbon tax on the national level	Domestic	Unlimited
China	ETS (Cap-and-trade system) and intensity-based ETS on the national and subnational level	**National ETS**: domestic **Beijing, Chongqing, Fujian, Guangdong, Shenzhen**: domestic (national and regional) **Hubei, Shanghai, Tianjin**: domestic (regional)	**National ETS**: 5% **Beijing**: 5% **Chongqing**: 8% **Fujian**: 5% **Guangdong**: 10% **Hubei**: 10% **Shanghai**: 3% **Shenzhen**: 20% **Tianjin**: 10%
Colombia	Carbon tax on the national level	Domestic	Unlimited
Japan	ETS (Cap-and-trade system) on the subnational level	**Tokyo:** domestic (regional) **Saitama**: domestic (regional)	**Tokyo**: unlimited for Tokyo credits, 33% for non-regional credits **Saitama**: unlimited for Saitama credits, 33% for non-regional credits (50% for factories)
Mexico	ETS (Cap-and-trade system) on the national level	Domestic	10%
Mexico	Carbon tax on the national and subnational level	**National carbon tax**: domestic **Querétaro**: domestic (regional)	**National carbon tax**: not defined **Querétaro**: 20%
Republic of Korea	ETS (Cap-and-trade system)	Both domestic and international	5%
South Africa	Carbon tax on the national level	Domestic	10%
United States	ETS (Cap-and-trade system) on the subnational level	**California**: domestic + from Québec **Washington**: domestic **RGGI**: domestic	**California**: 4% **Washington**: 8% **RGGI**: 3.3%

Source: ICAP Status Report 2022, World Bank Carbon Pricing Dashboard.

[17] Nova Scotia's cap-and-trade legislation includes the possibility for an offset system, but no system has been introduced.

3.9 Incompatibilities of compliance cycles

Another issue arises if the compliance cycle of a domestic carbon pricing instrument is not aligned with the CBAM compliance cycle. This question will need to be addressed regardless of the recognition approach chosen. For instance, a good produced and imported to the EU in the year t would need to be included in the CBAM declaration due in May of t+1. If the surrender obligation for this good in the domestic carbon pricing scheme is only due in June of t+1, the declarant cannot provide data on domestic carbon costs incurred under the **actual payment approach**. The CBAM framework should in these cases provide the possibility to compensate for domestic carbon costs after the CBAM declaration was submitted, for example, by crediting the applicable reduction of the CBAM obligation to the declarant's account. It might also be useful to align the compliance cycles of CBAM and major trade partners, e.g., by allowing for a late submission of the CBAM declaration.

For some EU trade partners with existing carbon pricing systems, the compliance cycles are compatible with the proposed submission timeline for the CBAM declaration (South Korea, Canada, Kazakhstan, and some US subnational systems). For other important jurisdictions, such as China (see Table 4), there will be a need for adjustments as verified data on the effectively incurred carbon costs might not be available to a declarant by 31 May of a given year when the CBAM declaration is due.

In summary, incompatibilities of compliance cycles pose a conceptual challenge and an even more complex implementation challenge to the recognition of third-country carbon prices under CBAM under the actual payment approach. This challenge is less pronounced under the **average price approach** because the EU authorities could determine the average carbon prices for third-country CPIs based on CBAM compliance cycles. However, carbon tax levels might vary throughout the CBAM compliance cycle because of tax increases. Similar to the calculation of average carbon prices for an ETS, weighted averages of the different tax levels would then constitute the average carbon price.

Table 4: Compatibility of compliance dates for selected EU trade partners with explicit CPI in place

Jurisdiction	Explicit CPI in place	Compliance date (surrender obligation)	Compatibility with CBAM compliance date (31 May)
Argentina	National carbon tax	Monthly	Yes
Canada	ETS (Cap-and-trade system) and tradable performance standards (intensity-based ETS and baseline-and-credit system) on the subnational level, carbon tax (fuel charge) and intensity-based ETS (OBPS) on the federal level	**Nova Scotia**: 1 May **Québec**: 1 June	**Nova Scotia**: yes **Québec:** yes
Chile	National carbon tax	31 December (annually)	Yes

Jurisdiction	Explicit CPI in place	Compliance date (surrender obligation)	Compatibility with CBAM compliance date (31 May)
China	ETS (Cap-and-trade system) and intensity-based ETS on the national and subnational level	**National ETS**: 30 April (reporting deadline) **Beijing**: June **Chongqing**: varying **Fujian**: 31 June (varying) **Guangdong**: 31 June (varying) **Hubei**: 31 May (varying) **Shanghai**: June **Shenzhen**: 31 August **Tianjin**: 31 June	**National ETS**: no[18] **Beijing**: no **Chongqing**: likely no **Fujian**: no **Guangdong**: no **Hubei**: yes **Shanghai**: no **Shenzhen**: no **Tianjin**: no
Japan	ETS (Cap-and-trade system) on the subnational level	**Tokyo:** 30 November of following year **Saitama**: Verified by 30 September of the second year after the compliance period	**Tokyo**: no **Saitama**: no
Kazakhstan	ETS (Cap-and-trade system)	1 April	Yes
Mexico	Carbon tax on the national and subnational level	Monthly	Yes
New Zealand	ETS (Cap-and-trade system)	31 March	Yes
Republic of Korea	ETS (Cap-and-trade system)	31 March	Yes
United Kingdom	ETS (Cap-and-trade system)	31 March	Yes
United States	ETS (Cap-and-trade system) on the subnational level	**California**: 1 April (reporting), 10 August (final verification) **Pennsylvania**: 1 March **Washington**: 1 November **RGGI**: 31 December (3-year control period)	**California**: yes **Pennsylvania**: yes **Washington**: no **RGGI**: no

Source: ICAP Status Report 2023, World Bank Carbon Pricing Dashboard.

[18] The final allocation of allowances and surrender obligation in the China National ETS takes place only after the verification date by 30 June of the following year.

3.10 Conclusion: challenges and open questions

Table 5 summarises the individual questions with a concluding assessment of whether the challenge is light (green circle), medium (yellow), or complex (red) under each approach.

Table 5: Challenge posed by individual question

	Average price approach	Actual payment approach
Multi-product installation	🟢	🔴
Multi-installation/input products	🟡	🔴
Availability and reliability of data	🟡	🔴
Determining the reference price of CBAM certificates	🟢	🟢
Upstream system	🟢	🟡
Subnational systems	🟡	🟢
Compatibility of systems' scope	🟢	🟢
Treatment of domestic or international offsets	🟡	🟢
Incompatibilities of compliance cycles	🟡	🟡

4 Recognition process and considerations for different types of carbon pricing instruments

4.1 ETS: Cap-and-trade systems

Cap-and-trade systems are quantity-based instruments that set a fixed emissions cap. Regulated entities have an obligation to surrender allowances for their covered emissions. They can buy allowances in auctions or trade them on the secondary market. These markets determine the allowance price and, hence, the price level is fluctuating and subject to uncertainty.

The actual payment approach can be directly applied to cap-and-trade systems. For this, declarants need to provide evidence of the effectively incurred carbon costs for the imported products. This requires documentation of the number of allowances that have been surrendered domestically at installation level as well as of the price effectively paid for these allowances. Recognised carbon costs can include allowances that have been purchased before the current compliance period, as most cap-and-trade systems allow for banking of allowances. The CBAM declaration should also include proof that the declared allowances have indeed been surrendered. For this approach, the date of surrendering would be defined as the time when the costs for those allowances have been effectively incurred (not the time of purchase which might precede the current compliance period).

4.1.1 Determining the allowance price

As the compliance obligation under a cap-and-trade system is measured in allowances to be surrendered, it is not simple to determine the effectively paid carbon price for a specific product. For the **average price approach**, a challenge arises because there is no official methodology on how to determine an average carbon price under an ETS. One intuitive option is to use simple or weighted averages of the market clearing price at allowance auctions. However, not all ETSs hold auctions or data might be limited. Trading might mainly take place on secondary markets. When these are established at an official exchange, price data might be available. There will likely be no official data on prices for bilateral over-the-counter trading of allowances. With this in mind, it could be that the average price approach overestimates the actual carbon price.

Under the **actual payment approach** there is a clear incentive to overstate incurred carbon costs if it can be deducted from the CBAM obligation. For instance, producers would want to attribute the most expensive allowances to their export goods. To prevent this, it is necessary to use installation-level data to derive average carbon costs for the production during the reporting period.

Similarly, producers would have an incentive to buy domestic allowances at a high price, sell them in parallel on the secondary market but pretend that they have been surrendered. To prevent this type of fraud, a direct link needs to be established between the surrendered allowances and the price paid for these allowances. For this, it should ideally be traced when the installation bought the surrendered allowances and at what price. This is the first-best method, as it truly reflects the carbon costs incurred by the regulated producer. The feasibility of this method's implementation depends on the specific features of each system and might vary substantially. For instance, it might be difficult to follow the chain of transactions for over-the-counter (OTC) trading with limited price transparency. As the responsibility to provide evidence for carbon costs incurred is on the producing installation, it needs to provide sufficient documentation to the declarant. However, this would require the installation to share a large

amount of (potentially confidential) data from its trading account with the declarant, and it might be challenging to verify the information.

If such a direct link between the surrendered allowances and the price paid for these allowances at the installation level cannot be established, there are several alternative approaches that could be used. A second-best method would be to use the average (purchase) price of all allowances in the account of the installation at the time of surrendering under the domestic system as the effectively paid carbon price per tCO_2e. This option would prevent any "picking-and-choosing" of surrendered allowances by an installation for recognition of the associated carbon costs for exported products under CBAM. This would require two types of installation-level data to be provided by producers: the total amount of allowances in their trading accounts of the domestic system (including both purchased and freely allocated allowances) and the total costs for all allowances that have been purchased (documented with respective invoices indicating the purchase prices). This would yield the total sum of carbon costs effectively incurred by the installation, including allowances acquired through auctions and secondary or OTC trading. The total amount of carbon costs incurred would then be divided by the total number of allowances acquired to yield the average carbon price effectively paid by this installation per tCO_2e (for all products covered by the third country system). This approach has the advantage that - in contrast to the first-best method described above - evidence of individual allowances being surrendered would not be required. However, using average prices might be regarded as unfair. A simplified version of this second-best solution could limit the scope of required data by determining the average carbon price effectively paid for the current compliance period of the third-country system.

If neither of these methods is feasible, the average carbon price approach could be used as a fallback option. This would entail an ex-ante calculation of the product-specific, yearly average carbon price in the third country-system and adjusting this for any applicable reductions or rebates (incl. free allocation of allowances) that an individual installation might have received (see chapter 2.2).

4.1.2 Treatment of free allocation of allowances

The **actual payment approach** takes into account any free allocation of allowances to regulated entities in the third country by default, since those allowances do not entail any effectively incurred carbon costs. For systems where 100% of allowances are allocated for free, there is no effectively paid carbon price that could be recognised under CBAM. Yet, it is necessary to derive average product-level carbon costs from the installation-level data, so that it is not possible for an installation to claim that free allocations count for domestically sold products while export goods paid the full domestic carbon price. This requires installation-level data on the total amount of effectively incurred carbon costs, the total output, and (in case of multi-product installations) the emission intensity for all goods produced by the installation in the current compliance period.

Under the **average price approach**, EU authorities would need to determine the average of free allowances allocated to a ton of product in order to set the third-country carbon price to be recognised under CBAM. The process will be different for different types of free allocation (e.g., on the basis of historical emissions, i.e. grandparenting, product benchmarks or fuel benchmarks). Because this approach uses averages, a producer with a low-emission installation whose emissions are fully covered by the product benchmark, and hence does not effectively pay the domestic carbon price, will obtain the same recognition as a producer whose emissions are above the benchmark and hence pays a significant carbon price domestically. While data to

determine an average allocation under product benchmarks is available, this might not be the case for individual allocations based on grandparenting.

4.2 ETS: Tradeable performance standards (TPS)

In contrast to cap-and-trade systems, tradable performance standards (TPSs) do not impose an absolute cap on aggregate covered emissions. Instead, there is a mandatory performance benchmark for certain facilities or products, set either as an emissions baseline (an individual cap on the facility level) or through an emission intensity benchmark (measured in tCO_2e per unit of output).

Tradable performance standards can be broadly distinguished into two types: baseline-and-credit systems and intensity-based ETSs. The Australian Safeguard Mechanism is an example of the former, where regulated entities that underscore their baseline emissions (based on historical emissions) receive credits from the government and entities that exceed their baseline must purchase credits or offset units to compensate their excess emissions. The compliance obligation is thus defined by the facility-specific emissions baseline and applies only for emissions above this baseline, in contrast to cap-and-trade systems where it is equivalent to the total amount of covered emissions.

Examples of intensity-based ETSs are most of the Chinese systems, with coverage of the power (China national ETS) and industry sectors (regional pilots except Chongqing and Guangdong). Regulated entities receive a certain number of allowances for free, using a performance standard (benchmarking) or historical emissions (grandparenting) as basis for allocation. They can use these to fulfil the compliance obligation of surrendering an equivalent number of allowances to their aggregate emissions (adjusted for total output) in the compliance period. Entities with an average emission intensity below the benchmark can sell their excess allowances in the market to other entities who can buy them to cover their compliance obligation. Some of the Chinese regional pilots also hold auctions to insert more allowances to the market. The output-based approach of an intensity-based ETS aligns this instrument with the product-based CBAM. The difference to a cap-and-trade system is in practice more related to the stringency of the instrument as an intensity-based ETS has no absolute cap.

The recognition process for effectively incurred carbon costs under CBAM as described in section 2 can also be applied to baseline-and-credit systems and intensity-based ETSs. Regulated entities under a TPS do not pay a carbon price for every tonne of their covered emissions, but only for the share that exceeds the intensity benchmark or the emissions baseline. This share can then be recognised under CBAM as third-country carbon costs.

4.2.1 Effectively paid carbon price

For an intensity-based ETS, determining the effectively paid carbon price is equivalent to the process under a cap-and-trade system. For baseline-and-credit systems, however, determining the carbon price under the **average price approach** can be challenging. As the reduction targets under these instruments are installation-based, EU authorities would need to construct an example installation with an average production level to derive the share of emissions of an average product that is covered by the instrument. Furthermore, some baseline-and-credit systems like the Australian Safeguard Mechanism also allow offsets to be used for compliance which is particularly challenging under the average price approach (see section 3.8).

In most tradable performance standards, there is no primary market for allowances and the majority of trading takes the form of over-the-counter transactions between regulated entities and/or financial intermediaries. These business transactions are usually confidential and might

involve "package deals" that do not entail a clearly agreed price per allowance. This could make it challenging for a declarant to provide the required documentation of allowances/credits surrendered and the price that has been effectively paid for them under the **actual payment approach**. Under the **average price approach,** the potential lack of data under TPSs can present an obstacle for EU authorities in determining the effectively paid carbon price.

4.2.2 Compliance cycle

For intensity-based ETSs, the compliance cycle is longer than for cap-and-trade systems which could complicate recognition of carbon costs under CBAM. This is because the applicable surrender obligation and, by extension, the effectively incurred carbon costs of an installation can only be determined ex-post, after submission of the emissions report for the current compliance period. For example, most of the Chinese systems have a two-stage allocation process where the final allocation of allowances only takes place after the reporting date to adjust for the actual output of the regulated entity. Consequently, the compliance date by which allowances must be surrendered does not occur until after this ex-post adjustment, which can be up to 1.5 years after the end of the compliance period. This is incompatible with the CBAM compliance cycle and poses a challenge under the actual payment approach (see also section 9).

4.3 Carbon taxes

A carbon tax is a levy explicitly corresponding to emissions. It can be applied upstream on importers or distributors of fossil fuels (indirect tax), at point source or downstream at consumption level (direct tax). Carbon taxes in third countries are eligible for recognition under CBAM if they are explicitly charged on the emissions (denoted in $ per tCO_2e) associated with the production of a covered good, either upstream or at point source. For a point-source carbon tax, the concept outlined in section 2.3 is directly applicable, starting with the calculation and documentation of installation-level carbon costs. For an upstream tax, carbon costs passed through from the fuel distributor to the installation would need to be disclosed in the respective invoice under the **actual payment approach**.

Potentially, exports can be exempted from the domestic carbon tax or are fully covered under ex-post compensation schemes, so that the actual payment under the domestic carbon tax is zero. In this case, the declarant cannot apply for recognition of the third-country carbon price.

4.3.1 Definition of carbon tax

In practice, the frontier between a carbon tax and a fuel tax is blurry. Independent of the chosen approach, CBAM authorities will need to provide a clear definition for what will be accepted for recognition under Article 9. Two criteria for an eligible carbon price can be extracted from Article 3 (29) of the CBAM regulation:

1. It needs to be imposed by an explicit emissions reduction scheme, i.e., its regulation should clearly state the objective to reduce emissions, and
2. It needs to be explicitly charged on the associated greenhouse gas emissions.

There are systems for which it is not clear if they fulfil the requirements. The Mexican carbon tax is a case in point: it is a fuel tax with a fixed tax rate for different fossil fuels. The tax rate is based on the carbon content of covered fuels above the carbon content of natural gas. In this sense, natural gas serves as a benchmark for the carbon tax. The tax is thus an emissions reduction scheme in its spirit, with the clear goal to induce a fuel switch from emission-intensive fossil fuels to natural gas. However, the tax rate is charged as a fixed amount per liter/gallon of fuel

and not directly per tCO_2e: There is no direct, but only an indirect link to the embedded emissions. It is not clear if an indirect link to emissions is sufficient to fulfil the second criterion.

In order to ensure the WTO-compatibility of CBAM, the EU needs to apply clear and uniform criteria for eligibility as carbon tax. There can be no margin of discretion or political favours to close trade partners since this would undermine the non-discriminatory application of CBAM as a trade measure for environmental objectives.

Whatever eligibility criteria the EU chooses, there is an inevitable risk that third countries could adjust the design of existing fuel taxes to be recognised as "carbon levies" under CBAM.

4.3.2 Rebates and indirect forms of compensation

For carbon taxes, the EU authorities need to carefully define which rebates and other forms of compensation will be considered for the calculation of the effectively paid carbon price in a third country, independent of the chosen approach. In particular, the authorities will need to determine what qualifies as an ex-post or indirect CBAM compensation. It will be challenging to identify them and delineate from other, not directly CBAM-related subsidies. For example, one could imagine a scenario where an exporter pays a domestic carbon tax on covered emissions and can also provide evidence of the effective payment but receives an ex-post rebate or a compensatory reduction of a different tax or levy. If the compensation is linked to the payments made under CBAM, this would undermine the incentive to reduce emissions for CBAM products. Such linking of compensation to CBAM payments is more likely to occur under a carbon tax than an ETS because of the relatively clearer insight into the explicit carbon costs of producing installations. On the other hand, if the compensation is independent of the CBAM payment, this indirect compensation might put EU firms at a disadvantage, but the steering effect of the carbon price would remain intact, and there would be no immediate problem that would need to be addressed as a result.

Under the **average price approach**, EU authorities need to determine the level of rebate by which the recognised average price will be reduced. However, third countries might only determine the rebate ex post, i.e., after the CBAM report or declaration was handed in. Under the **actual payment approach**, declarants and producers would need to be held accountable for reporting any relevant ex-post rebates. Independent of the approach, any ex-post rebates would require the purchase of additional CBAM certificates.

5 Conclusion and Outlook

While the 'if' of an introduction of an EU CBAM has been decided, the 'how' still needs to be developed with a large number of technical questions that arise. The goal must be to design a system that, on the one hand, creates a level playing field between EU and third-country producers and, on the other hand, imposes a manageable regulatory effort that does not generate a de facto barrier to trade, especially for developing economies which might struggle to provide complex infrastructure for MRV. The EU CBAM can only create a true level playing field if carbon costs incurred in third countries can be deducted from CBAM surrender obligations. The recognition process should be designed in a fair and efficient way. This could reduce criticism towards the new instrument, increase its compatibility with WTO law, and show appreciation towards international efforts to put a price on carbon.

The aim of this discussion paper is not to develop a final recommendation on the design of the system for recognising third-country carbon pricing under the CBAM but to lay the general foundations for the process to establish binding EU rules, which is due to start in 2024 and be finalised by the end of 2025 at the latest. The paper presents two methodological approaches of how to implement the recognition process: the average price approach that uses country-wide carbon price averages and the actual payment approach which recognises actually incurred carbon costs. The average price approach benefits importers as it relieves them from providing evidence for their payments under a domestic CPI. However, the lack of precision caused by employing carbon price averages could lead to unfair treatment, especially for importers that incurred above-average carbon costs. The advantages of the actual payment approach are that it directly treats the questions of how to account for the free allocation of allowances or tax rebates, and of how to deal with subnational systems. In contrast to the average price approach, it does not require the EU to assess carbon price levels in trading partner countries. It rather assigns the responsibility for providing evidence to the CBAM declarant, and subsequently to the producing installation, who both have an interest to achieve the recognition of their carbon costs incurred under a third-country instrument. As a downside, there is an incentive to strategically overstate incurred carbon costs. The two approaches represent two opposite methods for the recognition of third-country carbon prices. It would be possible to apply a hybrid approach combining elements of the two extreme cases. For instance, an average price including a mark-down could serve as a fallback option if evidence for actual payment cannot be provided.

After a first discussion and comparison of both approaches, the discussion paper analyses regulatory options and open questions in detail. The analysis shows the complexity of the conceptual and technical questions stemming from the recognition of third-country carbon prices under the EU CBAM. Besides these technical aspects, there are several overarching political and economic issues involved in this process. For instance, the procedures outlined above assume that the CBAM MRV system runs separately from the third-country MRV system. This may imply a substantial repetition of tasks and high regulatory costs for third-country installations and CBAM declarants. While it is now priority to implement the novel instrument, bilateral cooperation between the EU and its trade partners could help aligning MRV systems and reduce inefficiencies in the medium run. This could also be supported by multilateral processes, for instance in the framework of the newly created climate club or the OECD's Inclusive Forum on Carbon Mitigation Approaches.[19]

While a high level of stringency and robustness is vital, a fair amount of pragmatism is advisable for the EU to ensure the CBAM is not perceived as a unilaterally imposed trade barrier. For

[19] See OECD (2023).

instance, it could be helpful for the recognition process to allow for "quick fixes" to accommodate specific features of third-country systems (e.g., compliance at company level without access to installation-level data).

To inhibit fraud or circumvention, the actual payment approach should feature a general obligation for producers and declarants to report any ex-post changes in third-country carbon costs reported under CBAM, e.g., an ex-post compensation received under the domestic instrument. Note that the system can only consider payments related to CBAM and third-country carbon pricing instruments. Other compensation methods, e.g., in the form of Carbon Contracts for Differences or general subsidies to CBAM sectors, are outside the level playing field that CBAM intends to create. Likewise, the system cannot prevent trade partners from changing the design of existing energy taxes to meet carbon tax eligibility requirements under CBAM.

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