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Extension of the CBAM scope



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SUMMARY

- *The CBAM is intended for progressive expansion, with regulatory provisions and ongoing studies by DG TAXUD exploring both horizontal extension to new sectors and vertical extension within existing ones.*
- *Vertical extension (upstream or downstream within covered sectors) is primarily driven by carbon leakage risk, but presents challenges related to increased administrative complexity, potential for circumvention through minimal processing, and diverse stakeholder views on its feasibility and impact across value chains.*
- *Extending CBAM horizontally to entirely new sectors requires consideration of leakage risk, potential inter-sectoral competitive distortions, the burden of complexity for producers, and administrative challenges for regulators, including the unique case of transport emissions.*
- *EU CBAM and EU ETS are a single package and should be treated in a coordinated manner.*

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1. Introduction

The European Roundtable on Climate Change and Sustainable Transition (ERCST) has a history of engaging with the development and implications of carbon pricing mechanisms, including the EU Emissions Trading System (ETS) and the EU Carbon Border Adjustment Mechanism (CBAM). Previous work has explored various aspects of carbon leakage, competitiveness, and the design features necessary for effective and equitable climate policies.

Building on previous work conducted with Phases I (2019-2020), II (2020- 2021), III (2021-2022), IV (2023), and V (2024) of its project “Border Carbon Adjustments in the EU”, the ERCST has extended its analysis of the evolving CBAM into a sixth phase, providing decision-makers and stakeholders with a better understanding of critical issues as the CBAM proceeds from the transitional phase to the definitive phase from 1st January 2026.

This paper explores the potential extension of the CBAM and offers a comprehensive analysis of the key considerations involved in broadening its scope vertically and horizontally. It builds on the ERCST’s prior contribution to this discourse in the 2024 report “*Including products further down the value chain in the EU CBAM*”,¹ which examined the critical risks and factors associated with extending CBAM coverage to downstream products.

Following this introduction, Section 2 provides the broader context for the discussion on CBAM scope extension, outlining past considerations and the relevant EU decision-making processes. Section 3 lays out the fundamental starting points for analyzing scope extension. Sections 4 and 5 delve into the specifics of horizontal and vertical extensions, respectively. Section 6 outlines the criteria for inclusion, and Section 7 offers conclusions and recommendations.

2. Context

The initial scope of the CBAM, which entered into its transitional phase in October 2023, focuses on a limited number of carbon-intensive goods deemed to be at the highest risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen.

However, from the outset, there has been an acknowledgment that this initial scope might need to be broadened to fully achieve the mechanism's objectives. Achieving the full environmental and market impact envisioned by the CBAM will likely require a progressive expansion to additional

¹ Andrei Marcu et al., *Including products further down the value chain in the EU CBAM* (Brussels: ERCST, 2024), <https://ercst.org/including-products-further-down-the-value-chain-in-the-eu-cbam>.



sectors, upstream inputs, and downstream products that also carry significant embedded emissions and are vulnerable to competitive distortions arising from differing carbon constraints.

2.1. Regulatory provisions

The intention to progressively expand the CBAM's coverage is embedded in both the recitals and operative provisions of the CBAM Regulation, which outline a clear legal framework for future scope extensions:

- **Recital paragraph 67** of the CBAM Regulation anticipates expanding the mechanism by 2030 to cover all EU ETS sectors, especially goods at high risk of carbon leakage and downstream products containing significant amounts of covered goods.
- Article 30 of the CBAM Regulation requires the Commission to assess and report on such scope extensions mentioned above:
 - Per **Article 30(2)**, the Commission shall present a report to the European Parliament and to the Council before the end of the transitional period, containing an assessment of the possibility to extend the scope to embedded indirect emissions, embedded emissions in the transport, additional goods at risk of carbon leakage (specifically organic chemicals and polymers), and other input materials (precursors) for the CBAM-covered goods.
 - **Article 30(3)** mandates the Commission to submit a report to the European Parliament and Council at least one year before the end of the transitional period, recommending additional downstream products related current CBAM-covered goods under Annex I, for possible inclusion in CBAM. This recommendation should be based on a methodology that considers total greenhouse gas emissions and the risk of carbon leakage.

As of June 2025, the Commission has not yet fulfilled its obligations under Articles 30(2) and 30(3) of the CBAM Regulation. Both reports are anticipated in the second half of 2025, with the Article 30(3) report, which specifically addresses downstream products, noted as delayed until the end of 2025.

2.2. Preparatory studies

In preparation for the upcoming reports, the Commission has launched supporting studies to evaluate the feasibility and implications of extending the CBAM scope. The studies, commissioned by DG TAXUD, seek to gather empirical data, consult stakeholders, and develop methodologies that align with CBAM's core objective of addressing carbon leakage risks across a broader range of goods and supply chain stages.



Extension to additional sectors, precursors, and the transport of CBAM goods (per Art. 30(2))

DG TAXUD launched a study in July 2024 to explore the possible extension of CBAM to additional sectors, precursors, and the transport of CBAM goods. Scheduled for completion in November 2025, the study goes beyond the current scope of Annex I by analyzing the potential inclusion of:

- Goods not currently covered but deemed at carbon-leakage risk, notably organic chemicals, polymers and similar industrial inputs. The study will rank priority sectors/products for horizontal extension based on criteria like leakage risk, emissions relevance and technical feasibility.
- Key raw inputs or precursors used to make Annex I products (e.g., chemical feedstock for steelmaking), especially those contributing large embedded emissions.
- Emissions from shipping or transporting CBAM goods to the EU, and related transport services.

Stakeholders were consulted via surveys and a bilateral meeting in May 2025. Results are planned to feed into the report to co legislators by mid 2025, providing input for any legislative proposals to extend CBAM's scope.

Extension to downstream products (per Art. 30(3))

DG TAXUD also initiated a study in May 2024 on potentially extending the CBAM scope to include downstream or manufactured products—that is, processed goods derived from CBAM basic goods.

Its main objectives are to identify which downstream products (e.g. finished metal goods, fabricated steel components, refined aluminum items) are exposed to carbon leakage risks (based on CBAM/ETS induced cost-change and trade intensity), and to assess the feasibility and implications of including them in CBAM.

The study includes stakeholder consultations and industry surveys. The study, expected to conclude by July 2025, will help determine whether, and how, selected downstream products could be added to the CBAM scope, contribute to the report for co-legislators.

On 19 March 2025, as part of the Steel and Metals Action Plan, the European Commission confirmed that its first legislative proposal—expected by the end of 2025 following the CBAM review—will include an extension of the mechanism's scope to cover certain downstream steel and aluminum products, along with additional anti-circumvention measures.



3. Starting points

To effectively analyze the potential for CBAM scope extension, it is crucial to establish clear definitions of potential extensions. The horizontal extension refers to the inclusion of entirely new sectors or goods that are not currently covered in Annex I of the CBAM Regulation, such as chemicals, refineries, paper, glass, ceramics, and plastics. In contrast, the vertical extension pertains to broadening the scope within sectors already included in the CBAM. This can occur upstream, by covering raw materials or intermediate products used in the production of already-regulated goods, or downstream, by including more processed products further down the value chain derived from these regulated materials.

According to recital paragraph 31 of the CBAM Regulation, the selection of goods covered by CBAM should be based on their significance in terms of greenhouse gas (GHG) emissions and carbon leakage risk in EU ETS sectors. Key criteria include:

- Relevance of sectors in terms of GHG emissions,
- The sector's exposure to significant risk of carbon leakage, and
- The need to balance broad product coverage in terms of GHG emissions, while limiting complexity and administrative burden.

Moreover, the decision of whether or not to extend the CBAM scope is fundamentally dependent on assumptions about several interconnected factors, including:

- Developments under ETS reform: The future of free allocation of emission allowances and mechanisms for indirect cost compensation under the EU ETS will significantly impact the competitiveness landscape and the risk of carbon leakage.
- Elaboration of the CBAM: Further details and decisions on aspects such as the coverage of exports, measures to prevent resource shuffling and address circumvention, further simplification of administrative procedures, the eventual coverage of indirect emissions, and the specification of default values will all influence the implications of scope extension.
- Vertical and horizontal scope interdependence: The question of horizontal extension in some cases depends on assumptions about vertical coverage – specifically, how far down the value chain the existing or expanded coverage will extend. A clear understanding of these starting points and their interdependencies is essential for a robust analysis of CBAM scope extension.



4. Horizontal extension

What factors are important in the decision whether to include wholly new sectors in the CBAM – something we have termed horizontal extension?

The preceding section argued that it is challenging to pronounce on whether a given sector should or should not be included in horizontal extension, because there is a host of other as yet unknown factors that significantly affect that decision, including for example whether the CBAM will cover exports. However, the aim of this section—and the next, which covers vertical extension—is not to pronounce on whether particular sectors or particular parts of the value chain should be included in CBAM coverage, but rather to elucidate the key factors that are important to making such a decision.

Therefore, for our purposes we can address the challenges posed by the many as-yet unknown factors discussed above by assuming them fixed. In this section and the next, we assume that the CBAM is fully effective at preventing leakage and resource shuffling, and that there will be a phase out of free allocation more or less as outlined under the CBAM regulation. This allows us to focus on the influence of other factors in decisions about extension of coverage.

To be clear, this does not imply that the key factors we discuss here and in the next section are only valid in that idealized scenario. The factors we identify will be relevant under any scenario, even if in some scenarios other factors such as those discussed above might rival them in importance.

4.1. Leakage risk

The first consideration in any potential extension must be to what extent the sector faces risk of leakage as free allocation is reduced, and a full carbon price is paid. Since the objective of the CBAM is prevention of leakage,² this should be a threshold condition: if risk of leakage is not high, then there is no need to continue the analysis any further.

Another leakage-related consideration is the risk of leakage for producers that find themselves just beyond CBAM coverage in the value chain. While the risk of leakage generally diminishes the further down the value chain we go, and the higher the ratio of value-added to carbon costs, CBAM coverage has to stop somewhere on that value chain, and just beyond the point of stoppage there may still be some risk of leakage from foreign producers that process their goods just enough to get to that point.

² Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism, Recital para. 10. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R0956>.



According to our taxonomy, this is a vertical extension issue. But it becomes an issue to consider in horizontal extension if that risk is exacerbated by sectoral characteristics. If, for example, the sector has a very complex downstream value chain – for example plastics, with thousands of different products only a few processing steps down from basic polymers – then there is an inherent difficulty in setting the appropriate cut-off point in CBAM coverage downstream in order to prevent leakage in that sector. This complexity becomes an important factor when evaluating whether to include the entire sector in CBAM coverage in the first place.

4.2. Conditions of competition

Many industrial sectors have products that compete with those of other sectors, to a greater or lesser degree. It is important that the choice of sectors to cover under the CBAM should minimize the inter-sectoral distortion that choice might create. For example, some steel products compete directly with some aluminum products in end use. As such, including only one of the two sectors in CBAM coverage would confer some advantage on the included sector, since the excluded sector would face a higher carbon cost but no CBAM protection to allow it to pass those costs through to purchasers.

As a general rule, then, it is best to jointly include or exclude sectors that have a significant competitive relationship.

4.3. Burden of complexity

As noted in the previous section, the CBAM regulation specifies that the choice of goods covered should take into account, among other things, the need to limit complexity for the operators concerned, including those required to account for and verify the GHG emissions embodied in traded goods.³ In that context, there are two elements that should be taken into consideration:

- Do producers in the candidate sector import CBAM-covered inputs as part of the production process? In this situation, often referred to as CBAM-to-CBAM, producers face an additional layer of complexity in obtaining and verifying the required GHG-intensity data associated with these intermediate CBAM-covered imports. The degree of this complexity will vary depending on the number of producers and stages of value-added involved in the production of those inputs.
- Do producers in the candidate sector produce inputs for other CBAM-covered sectors? Expanding CBAM to cover a sector where this is the case will mean increased complexity for those downstream producers in other sectors, as it will increase the burden they face in obtaining and verifying the GHG-intensity data associated with those imports.

³ *Ibid.*, Recital para. 31.



4.4. Administrative challenges

The CBAM Regulation also aims, in the choice of goods covered, to limit the associated administrative burden.⁴ Here we interpret that to mean the burden on regulators of administering the regime. Regulators in this sense include, among others, those responsible for developing methodologies and defaults, those responsible for protecting against circumvention and detecting and addressing reporting errors, and customs officials responsible for enforcement. In that context there are two elements of relevance:

- Is the structure of production in the candidate sector, and the stages of the value chain to be covered, such that it would involve a large increase in the number of authorized declarants and associated reports? Would it involve a large number of products needing their own methodologies and calculated defaults? These sectoral characteristics would add to administrative burden.
- Is the structure of production in the candidate sector such that it would present inherent difficulties in crafting an appropriate methodology for estimated embodied emissions in traded goods? In the petroleum refining sector, for example, individual installations produce a variety of different products, presenting challenges in creating methodologies that can adequately allocate installation-level emissions among the products produced.

4.5. The special case of transport

One of the sectors to which the CBAM might expand horizontally is transport. The CBAM Regulation mandates a report to be prepared by the end of 2025 that assesses, among other things, “[t]he possibility to extend the [CBAM] scope to ... embedded emissions in the transport of the goods listed in Annex I and transportation services.”⁵ That is, the CBAM could eventually require importers to estimate and report the GHG emissions released by the combustion of fuel in the process of transporting CBAM-covered goods.

To be clear, coverage of transportation emissions is not like other forms of scope expansion. Transportation is a service, not a good, and it constitutes an input to all other goods-producing sectors. So it could be argued that expansion to cover transportation emissions is more like an expansion vertically to cover additional input/precursor emissions in the value chains of other sectors.

However we conceive of transport, presumably its coverage would correspond to coverage of transport under the ETS, which manifests in two distinct ways:

⁴ *Ibid.*, Recital para. 31.

⁵ *Ibid.*, Article 30.2(a)(ii).



- Maritime shipping: Emissions from maritime shipping are covered under the existing ETS. With allowances due for 100% of maritime shipping emissions within the EU, and 50% of emissions on voyages to or from non-EU ports.
- Road transport: EU fuel suppliers for road transport will need to purchase allowances under a new emissions trading system – the EU ETS 2 – as of 2027.

For maritime transport, 50% of the emissions associated with imports are already assessed a carbon price, and the remainder are not. There is no risk of leakage under this scenario: no case of domestic producers paying more in carbon costs for maritime transport emissions than is paid by importers. As such, maritime transport emissions would probably not be covered by CBAM.

For road transport, EU producers will be paying a carbon price that might not be borne by foreign producers, if those producers are not paying a carbon price on road transport fuels in the countries of production, which means there might be risk of leakage. As such, it is conceivable that the CBAM might expand to cover production emissions associated with road transport in the countries of export.

In this context, there are at least four considerations that should be taken into account in deciding whether CBAM horizontal extension to road transport would be appropriate:

- Road transport is an input good to all productive sectors, including those covered by CBAM. As such, including it would add complexity to the measurement, reporting and verification of emissions in all other covered sectors under CBAM. It would entail requesting data about the miles travelled and modes of transport associated with CBAM goods production in foreign countries, and so would add significantly to the administrative burden of detecting and addressing circumvention. It would also entail determining total road transport associated with an installation and then allocating those emissions to find just those associated with the exports in question, adding significantly to the burden of measurement, reporting and certification.
- Increased administrative burden would stem from the fact that the allowance price – and therefore presumably the CBAM charges – under the ETS2 are distinct from those under the existing ETS (at least for the first four years). This would complicate the process of calculating the applicable CBAM charge for imports.
- Administrative burden would also be increased by the fact that transport under the ETS 2 will not receive free allocation, and so should not be subject to a CBAM factor accounting for such free allocation even while that factor did apply to all the other emissions associated with production.



- The CBAM will credit for a carbon price effectively paid in the country of export.⁶ The administrative difficulties associated with this feature of the regulation are significant but are limited by the fact that relatively few jurisdictions have an industrial carbon price that applies to CBAM-covered goods. However, as of May 2025, over 70 national and sub-national jurisdictions have carbon taxes applying to transport fuels, all with unique characteristics that would require a calculation of the “effective” price applied.⁷ This would entail a significant increase in administrative burden.

5. Vertical extension

5.1. What do we mean with ‘vertical extension’

Vertical extension of the Carbon Border Adjustment Mechanism (CBAM) refers to broadening the coverage within sectors already regulated under CBAM, either upstream or downstream along their value chains. As already set out in Section 3 above, vertical extension differs from horizontal extension, which involves incorporating entirely new sectors or goods into CBAM coverage. Vertical extension thus pertains explicitly to expanding the scope within existing CBAM sectors such as steel, aluminium, cement, and fertilisers.

An upstream vertical extension involves including earlier-stage inputs or precursors necessary for producing goods already covered by CBAM. For instance, within the steel and cement sectors, upstream extension might encompass coke, sintered ore and ferro-alloys or limestone and other raw materials that contribute to the lifecycle emissions of steel and cement. Conversely, downstream vertical extension concerns products further down the value chain derived from CBAM-regulated commodities. In the case of steel, for example, this could entail machinery, white goods, automotive components, or other fabricated products consisting substantially of steel or steel alloys. In the case of cement, it could include prefabricated goods produced of reinforced concrete, such as pylons and structural elements used in construction of buildings and infrastructure.

A vertical extension has inherent implications for carbon leakage risk of affected goods and administrative complexity of implementation. Extending coverage upstream or downstream necessitates careful consideration of relative emission intensities, trade exposure, and practical feasibility in emissions reporting and verification. Importantly, as already highlighted in our earlier ERCST report on “*Including products further down the value chain in the EU CBAM*”,⁸ any

⁶ Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023, (*op. cit.*) Article 9.

⁷ World Bank. State and Trends of Carbon Pricing Dashboard. <https://carbonpricingdashboard.worldbank.org/>.

⁸ Andrei Marcu et al., *Including products further down the value chain in the EU CBAM* (Brussels: ERCST, 2024), <https://ercst.org/including-products-further-down-the-value-chain-in-the-eu-cbam>.



decisions on vertical extension of the CBAM also call for an evaluation of whether additional compliance burdens are proportionate to their environmental benefits and whether such extensions help prevent CBAM circumvention through product modification in the form of minimal processing just beyond the value chain inclusion threshold.

5.2. Upstream extension in covered sectors

Any decision on an upstream extension of the CBAM scope should primarily depend on the upstream carbon leakage risk, which requires comparing the situation with and without CBAM coverage. Upstream segments of the value chain in energy intensive sectors such as the sectors already covered by the CBAM typically involve highly emissive processes. For example, alumina refining for aluminium production is itself an energy intensive process, and together with baked anode material on average contributes to nearly half of the direct emissions released during aluminium production.⁹ Because European alumina refineries are covered by the EU ETS, however, they not only tend to already have lower carbon intensities than their international competitors, but face heightened carbon leakage risks as rising carbon prices make them increasingly uncompetitive in a challenging economic context, with declining European demand partially offset by growing demand in highly competitive global markets (where the CBAM does not address leakage risk yet, because it does not apply to European exports).¹⁰

Importantly, inclusion of upstream goods is likely to have far-reaching ramifications along the downstream value chain. Because upstream application of a CBAM will increase prices of raw material or intermediate inputs – the covered precursors – for downstream producers, a potential increase in the downstream leakage risk has to be carefully managed. Hence, extending CBAM coverage upstream may also require further downstream extension of the CBAM scope to prevent circumvention in which foreign producers modify goods sold to the EU just enough by adding value through further processing to fall outside the coverage boundary. In the case of alumina, where demand is increasingly coming from non-European markets, upstream application of the CBAM also requires consideration of robust solutions for export-related leakage because mined

⁹ International Aluminium Institute, “Greenhouse Gas Emissions Intensity: Primary Aluminium” (2024), <https://international-aluminium.org/statistics/greenhouse-gas-emissions-primary-aluminium/?publication=greenhouse-gas-emissions-intensity-primary-aluminium&filter=%7B%22row%22%3A%22group%22%3A%22multiGroup%22%3A%5B%5D%2C%22dateRange%22%3A%22annually%22%2C%22monthFrom%22%3A%22monthTo%22%3A%22%2C%22quarterFrom%22%3A%22quarterTo%22%3A%22yearFrom%22%3A%22yearTo%22%3A%22%22multiRow%22%3A%5B%5D%2C%22columns%22%3A%5B%5D%2C%22activeChartIndex%22%3A%22activeChartType%22%3A%22table%22%7D>.

¹⁰ European Aluminium and Rambøll, Third Party Study on Impact of CBAM on Alumina and Scrap Markets (Copenhagen: Rambøll, 2025), https://european-aluminium.eu/wp-content/uploads/2025/05/2025-04-24-EA_Ramboll-CBAM-Full-Report.pdf.



precursors like metal concentrates are globally traded at market prices, meaning that EU-producers are price-takers and thus particularly vulnerable to competitive distortions.¹¹

Upstream segments that are considered candidates for inclusion in the CBAM scope must also be assessed based on their existing carbon pricing exposure, notably coverage under the EU ETS. If segments like alumina refining already fall under the EU ETS but without dedicated product benchmarks for the free allocation of emission allowances – thus experiencing higher average carbon costs than other upstream producers who currently benefit from free allowance allocation – their inclusion in the CBAM could help level the competitive playing field and prevent leakage. Conversely, if upstream activities are entirely outside the framework of the EU ETS, introducing CBAM coverage would not only raise the question of the carbon cost that is being adjusted for, but would also entail the complex challenge of developing methodologies for accurately calculating and reporting embedded emissions in raw materials – which could involve detailed tracking of emissions from mining or refining processes – and building the relevant administrative capacities for implementation and compliance oversight. In some cases, this could also give rise to a mismatch of relevant product (CN) and activity (NACE) codes, adding further complexity to regulatory operationalization.¹²

5.3. Downstream extension in covered sectors

As with upstream materials and intermediate goods, the primary rationale for considering downstream vertical extensions within sectors already covered by the CBAM hinges upon the carbon leakage risk faced by downstream goods. This entails analyzing the ratio of embedded carbon emissions to gross value added, alongside trade intensity. Typically, because the most emissions-intensive activities in the value chain happen at the level of basic materials, the risk of leakage diminishes further down the value chain. More value is added, and not much embedded carbon is added, so the carbon cost as a percentage of the cost of the goods continuously declines. Also, at the level of final goods there are non-price factors like brand loyalty and style considerations that become important, meaning a simple cost increase may not be sufficient to drive buyers to foreign substitutes (though known EU brands could of course relocate production outside the EU).

Still, absent CBAM coverage, certain downstream products – particularly those with high metal content such as aluminium and steel – can be acutely vulnerable to leakage risks. Products like cookware, automotive components, white goods, and machinery exemplify these risks due to their high embedded carbon relative to value added, and exposure to international competition. These

¹¹ Euromines, *Mined precursors under CBAM: Euromines position* (Brussels: Euromines, 2025); for further discussion of solutions to export-related leakage, see Andrei Marcu et al., *Solutions for exports of EU CBAM-covered goods* (Brussels: ERCST, 2025), <https://ercst.org/solutions-for-exports-of-eu-cbam-covered-goods>.

¹² Euromines, n.10 above.



downstream goods generally share a characteristic that they consist of a very high physical percentage of CBAM-covered materials, such as iron, steel, or aluminium, which distinguishes them from other complex downstream goods such as entire automobiles, in which the CBAM-covered materials contribute a more limited share of the weight of the final good, and an even smaller share of its value.

In such downstream sectors, emissions leakage risks are set to increase as free allocation of allowances to producers of upstream raw material inputs diminishes. For instance, the Federation of the European Cookware, Cutlery, and Housewares Industries (FEC) – whose products routinely have a metal content exceeding 70% - estimates potential production losses of up to 35% absent an extension of the CBAM scope to cookware, and projects a significant increase in imports from regions lacking similarly stringent carbon constraints.¹³ Similarly, APPLiA – the trade association of home appliance manufacturers – anticipates a potential cost burden from the loss of free allocation to upstream activities that is equivalent to a substantial share of the home appliance producers' profit margins.¹⁴

At the same time, downstream extension also presents significant administrative and compliance challenges. In some sectors, such as machinery and automotive components, complex manufacturing processes entail multi-tiered international supply chains, making it inherently difficult to measure, verify, and attribute embedded emissions accurately. For instance, automotive components integrate thousands of parts from diverse global sources, significantly amplifying administrative complexity. The European Automobile Manufacturers' Association (ACEA) estimates administrative costs at approximately €5,000 per supplier annually for tier-1 suppliers alone, escalating dramatically for lower-tier suppliers and involving profound logistical and methodological complexities in verifying actual emissions data.¹⁵

Similarly, while machinery sector representatives underscore potential market distortions stemming from CBAM-related cost increases, they also highlight the even greater burden arising from complex international supply chains. The German Mechanical Engineering Industry Association (VDMA) points to significant cost mark-ups – for instance, additional CBAM-induced costs on aluminium inputs reaching 20-30% – as impactful, exacerbating competitiveness pressures already manifesting in declining European exports and production. Still, it opposes downstream extension of the CBAM to machinery equipment due to concerns about the disproportionate administrative cost of compliance across their own supply chains.¹⁶

By contrast, sectors such as cookware and white goods tend to have more straightforward value chains. For these sectors, the cost of input materials such as steel relative to the value of the final

¹³ FEC, *Impact Assessment on Carbon Border Adjustment Mechanism (CBAM)* (Courbevoie: FEC, n.d.).

¹⁴ Interview with APPLiA, May 2025

¹⁵ Interview with ACEA, May 2025.

¹⁶ Interview with VDMA, May 2025.



good is much more pronounced, yielding a very different assessment of the relative administrative burden and leakage prevention benefits that would follow from inclusion in the scope of the CBAM. Thus, the decision to extend downstream coverage must balance clear leakage and circumvention risks against attendant administrative complexity and cost burdens, factoring in sector-specific circumstances and market dynamics.

5.4. Assessment

The preceding analysis highlights several critical themes and tensions underlying vertical CBAM extension decisions within sectors already covered by the CBAM. Across sectors, preventing carbon leakage and maintaining a level competitive playing field are shared concerns. However, significant divergences are also apparent, particularly regarding the administrative and compliance burdens entailed by a vertical extension of the CBAM. Upstream stakeholders, such as mining and refining industries, stress compliance challenges and competitive risks, especially where globally traded commodities are involved and the CBAM does not yet address export-related leakage. Meanwhile, downstream industries differ markedly in their prioritization of leakage risks and the burden and complexity of compliance along their own supply chains.

Interviews conducted with industry stakeholders reveal pronounced sector-specific challenges and priorities. For instance, APPLiA and FEC strongly advocate downstream inclusion, emphasizing existential competitiveness threats absent CBAM protection. Conversely, sectors like automotive manufacturing (represented by ACEA) and machinery (represented by VDMA) expressed reservations regarding downstream extension, citing profound administrative complexity and logistical impracticalities. In part, those differences can be attributed to the different characteristics of the two types of products, with machinery manufacturing involving more complex potentially traded inputs and production steps.

All this suggests the need for a nuanced approach to vertical extension of the CBAM. Upstream extensions should proceed cautiously, with a view to a potential increase of export-related and downstream leakage risks and the need for related solutions. A downstream extension, meanwhile, requires a targeted assessment of the potential for undue increases in complexity and administrative burden, favoring inclusion of relatively simple product categories with a high share of CBAM-covered precursor content that are demonstrably at significant leakage risk. Ultimately, a vertical extension of the CBAM within already covered sectors calls for calibrated policy interventions, balancing environmental ambition against economic practicality. All this speaks for a phased implementation approach, extensive stakeholder engagement, rigorous methodological developments for emissions verification, and targeted mitigation strategies addressing specific competitive and administrative challenges.



6. Key criteria for extension

Building upon the preceding analysis, a set of key criteria emerges that should rigorously inform the European Commission decision regarding the extension of the CBAM coverage. These criteria are designed to ensure that any extension is strategic, effective, and minimizes unintended consequences:

1. **Risk of carbon leakage:** Foremost among these is the risk of carbon leakage, remaining the central rationale for considering horizontal and vertical extensions. The assessment must quantify the potential for carbon leakage should free allowances be removed and the studied sector or product remain outside the CBAM's scope. This foundational risk assessment dictates the urgency and necessity of inclusion.
2. **Emissions intensity:** Closely related is the emissions intensity of the candidate sectors or products. For horizontal extension, the cumulative GHG emissions generated by a sector are a critical indicator of its overall impact and potential contribution to leakage. In the context of vertical extension, the focus shifts: for upstream activities, the emissions-intensity of those specific operations is paramount, while for downstream products, the ratio of embedded carbon to the gross value added of the activities, coupled with their trade exposure, becomes a more decisive factor.
3. **Competitiveness and market dynamics:** When considering horizontal extension, it is essential to ascertain whether direct competitors are already covered by the CBAM and to what extent such competition exists. Furthermore, an assessment of whether the sector imports covered precursors is necessary, as extension could introduce new compliance or input costs for importers, potentially impacting their competitiveness. Conversely, if a sector produces precursors for many other CBAM-covered sectors, its inclusion could impose significant compliance and cost burdens on those downstream industries, necessitating a careful evaluation of the cascading effects.
4. **Administrative burden and complexity:** The importance of considering the administrative burden and complexity associated with any extension scenario cannot be overstated. A core principle of CBAM design is the need to limit complexity and administrative burden for operators. For horizontal extension, this involves scrutinizing the complexity of the value chain and the feasibility of identifying a clear cut-off point without merely shifting the risk of leakage to downstream producers. Similarly, the inherent complexity of the production process within a given sector must be evaluated to determine the difficulty in crafting a suitable methodology for calculating embedded emissions. Beyond the operators, the anticipated administrative burden on regulatory bodies and customs officials is a significant concern, particularly if extension would lead to a substantial increase in the number of authorized declarants, covered imports, or required reports. For both upstream and downstream vertical extensions, a thorough examination of



the new administrative and compliance burdens introduced by the scenario is imperative, including the practical challenges of obtaining accurate data from suppliers, especially for downstream products.

5. **Circumvention risk:** Specifically for downstream vertical extension, the extent to which the proposed extension would reduce the risk of circumvention is a critical consideration. This includes mitigating practices such as mis-labelling imports or processing goods just beyond the point of coverage to avoid CBAM obligations.
6. **Interdependencies:** Finally, it is paramount to recognize that decisions on scope extension are not isolated. The beneficial impacts of inclusion or exclusion from the CBAM for a given sector or good is fundamentally dependent on assumptions about several interconnected factors. These include (a) ongoing developments under ETS reform, such as the future of free allocation and indirect cost compensation mechanisms, (b) the further elaboration of the CBAM itself, encompassing aspects like the coverage of exports, measures to prevent resource shuffling and address circumvention, simplification of administrative procedures, eventual coverage of indirect emissions, and the specification of default values, and (c) the inherent interdependence between vertical and horizontal scope, where horizontal extension may sometimes hinge on assumptions about the depth of vertical coverage. A comprehensive understanding of these interdependencies is essential for any robust analysis of CBAM scope extension.

7. Conclusions and recommendations

Based on the preceding analysis, several preliminary suggestions emerge regarding the potential extension of the CBAM's scope.

Firstly, given the interdependence between the EU ETS and the CBAM, the question of scope extension should not be treated in isolation but rather addressed in tandem with ongoing reforms to the ETS. Both instruments are central to the EU's climate architecture and must evolve in a coordinated manner to ensure coherence, effectiveness, and fairness. Engaging in scope extension alongside ETS revisions would allow for a more integrated assessment of carbon leakage risks, cost impacts, and administrative feasibility.

For sectors potentially affected by CBAM expansion, this combined approach would offer greater policy certainty and alignment, reducing the fragmentation and confusion that could arise from treating these mechanisms separately. As such, scope extension should form part of a broader, well-timed policy package that reflects the updated realities of the EU's carbon pricing framework.



Nonetheless, it is acknowledged that some downstream sectors may face immediate pressures or demonstrate a compelling need for coverage, even in the presence of broader uncertainties. In such specific cases, certain forms of downstream vertical extension should be considered in the short term. This targeted approach could address acute carbon leakage risks or competitiveness concerns in particular value chains without necessitating a sweeping, comprehensive extension. For other downstream sectors, such as machinery and automotive components, the lower cost of embedded carbon relative to the value of the final goods, as well as – importantly – the complexity and international nature of their supply chains would entail such administrative burdens that their inclusion in the scope of the CBAM may never be justifiable.

Critical design and implementation issues—such as treatment of indirect emissions, export rebates, circumvention risks, and the harmonisation of embedded emissions methodologies—remain unresolved. Until these foundational challenges are addressed, further expansion risks compounding systemic weaknesses, making it difficult for industries to recognize the benefits of inclusion, even if those issues are eventually resolved. That said, not all sectors or products are suitable candidates for inclusion in the CBAM. In some cases, the technical challenges—such as practical and methodological difficulties in accurately quantifying, reporting, and verifying carbon footprints across complex international supply chains—along with economic or trade factors, may render CBAM coverage impractical or ineffective.

It is also important to recognise the political and reputational dynamics of the CBAM. If the mechanism is perceived as unworkable, overly complex, or misaligned with industry realities, many sectors will understandably resist being brought under its scope. In essence, if the CBAM does not function effectively, no one will want to be included. This underscores the need to build credibility through a functional, transparent, and fair system before seeking significant expansion.

Crucially, for any sectors or products ultimately included in the CBAM—whether through horizontal or vertical extension—it is imperative that they are afforded adequate time to develop the necessary systems for compliance. The complexities of data acquisition, reporting, and verification demand significant lead time for businesses to adapt their operations and establish robust compliance frameworks. Rushing this process would inevitably lead to increased administrative burdens, errors, and potential non-compliance.

Stakeholder consultations with relevant sectors must be an integral part of any decision to extend the CBAM scope. These consultations can provide valuable insights into the practical implications of inclusion in light of unique sectoral or goods-related characteristics, and help identify sector-specific risks and opportunities. While a sector's expressed interest in being included in the CBAM can serve as a useful indicator of perceived risks, competitive pressures, or potential benefits, it is important to emphasize that such expressions, though important, are not, in themselves, sufficient



grounds for inclusion or exclusion. Decisions on extending the CBAM must be grounded in a rigorous, evidence-based assessment against clearly defined criteria, such as those described in Section 6. This ensures that any extension remains aligned with the CBAM's core objectives: to prevent carbon leakage, maintain a level playing field, and support the EU's climate goals.

Finally, it is vital to maintain a realistic perspective: the CBAM is not a silver bullet. Even if its scope is extended, it represents only one instrument within a broader policy toolkit aimed at addressing carbon leakage and supporting industrial competitiveness. Complementary measures—such as fixing the design gaps in CBAM, expanding financial incentives, strengthening MRV in trade partners, promoting international cooperation, improving electricity market design, stimulating demand for low-carbon products, and supporting workforce transition—will continue to be necessary to ensure the ongoing viability and competitiveness of rapidly decarbonizing European industries in the global market.¹⁷

¹⁷ Andrei Marcu et al., *CBAM in a Portfolio of Measures for Industrial Decarbonization* (Brussels: ERCST, 2023), <https://ercst.org/cbam-in-a-portfolio-of-measures-for-industrial-decarbonization/>.



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