Europe's Carbon Border Adjustment Mechanism:

When Good Intentions Pave a Highway to Hell

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23 September 2025

Summary

- The EU's Carbon Border Adjustment Mechanism (CBAM), set to take full effect in 2026, aims to create a level playing field by applying carbon costs to certain imports, but risks unintended economic and trade consequences.
- While intended to prevent carbon leakage, CBAM's selective scope, targeting only a few intermediate goods, may disadvantage downstream EU industries that rely on these now costlier inputs.
- The phase-out of free carbon allowances will increase production costs for EU exporters, potentially reducing their competitiveness in global markets and encouraging offshoring.
- SMEs may suffer indirectly, as larger firms are forced to pass down the compliance burden, including the requirement to track and report embedded emissions.
- The complex reporting obligations and unverifiable emissions data increase administrative burdens and liability risks for importers, especially during the transition period.
- CBAM risks exacerbating global trade tensions, inviting retaliatory measures from major trading partners and potentially fragmenting international markets.
- In contrast, free allowances remain a more stable, less distortionary alternative that aligns with EU climate goals while limiting economic harm.

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Introduction

On 1 January 2026, the definitive regime of the EU Carbon Border Adjustment Mechanism (CBAM) will take effect. The EU Commission (EC) describes the CBAM as a 'tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries'.[1] In practice, the CBAM functions as a tariff duty on certain imported goods, with the cost being proportional to their implied carbon footprint and the market price of CO2 allowances in the EU Emissions Trading System (ETS). The CBAM is well-intentioned in that it aims to level the playing field between European manufacturers – who are required to compensate for their carbon emissions – and their foreign competitors, who are not always similarly obligated (or not to the same extent). However, good intentions even pave the road to hell the CBAM can negatively impact the EU market for various reasons that range from its administrative costs to its selective application to specific goods, as well as the trade distortions it can amplify, rather than mitigate, both within the EU and between the EU and its trading partners. The downsides of the CBAM are even more pronounced in a time of trade uncertainties and looming protectionism, as its costs may add up to – rather than offset – the tariffs that US President Donald Trump has imposed, along with the retaliation from Brussels and other major economies.

The understanding that the CBAM might backfire is quietly growing. On 22 May 2025, the European Council adopted an amendment to the CBAM regulation that would exempt small importers from the carbon duty.[2] This development is consistent with the philosophy underlying the Omnibus simplification proposal,[3] which reduces requirements for small businesses while openly recognising that mere compliance may have costs that far exceed the expected benefits of burdensome regulations. Unfortunately, simplifying the mechanism or limiting it to large businesses – which are supposedly better equipped to deal with complex regulations and can afford, if needed, to hire specialised personnel – may not be enough. In fact, they may address some direct costs of CBAM while leaving largely unaffected the much larger indirect costs. On the one hand, small and medium enterprises (SMEs) are often part of complex value chains led by large businesses; if these businesses face increased costs due to heavy regulation, SMEs will also indirectly feel the impact. On the other hand, the CBAM and other environmental regulations, such as the taxonomy (Stagnaro and Verde 2022) and sustainable finance reporting, require large businesses to track the emissions generated by their suppliers, including SMEs. This requirement would force SMEs to collect, organise, and provide the same information as large organisations or comply with the same obligations, even if they are not formally obliged to do so under the regulations themselves. On top, SMEs may import little CBAM goods from third countries but source massive amounts of CBAM goods from within the EU. If the application of CBAM results in increasing the prices of CBAM-covered goods – regardless of where they are produced – then the indirect impact, stemming from the full application of carbon prices and the phase-out of free allowances (see below), might be massive. This might, in turn, either result in significantly higher prices to consumers downstream or in further delocalization of these activities – or both.

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[1] 'Carbon Border Adjustment Mechanism,' European Commission, 28 March 2025 (https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en).

[2] 'Amendments adopted by the European Parliament on 22 May 2025 on the proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) 2023/956 as regards simplifying and strengthening the carbon border adjustment mechanism (COM(2025)0087 – C10-0035/2025 – 2025/0039(COD)),' European Parliament, 22 May 2025 (https://www.europarl.europa.eu/doceo/document/TA-10-2025-0108_EN.html).

[3] 'Commission simplifies rules on sustainability and EU investments, delivering over €6 billion in administrative relief,' European Commission, 26 February 2025 (https://finance.ec.europa.eu/publications/commission-simplifies-rules-sustainability-and-eu-investments-delivering-over-eu6-billion_en).

Perhaps it is high time to rethink the CBAM entirely.

The hidden costs of CBAM

According to the EC, 'The CBAM will initially apply to imports of certain goods and selected precursors whose production is carbon intensive and at most significant risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, electricity and hydrogen'.[4]

During the transitional phase (2023–2025), CBAM requires importers to 'report greenhouse gas emissions (GHG) embedded in their imports (direct and indirect emissions)'. Direct emissions are generated while manufacturing a product (for example, emissions from the use of coal in a steel furnace). Indirect emissions are generated by third parties. They include emissions from the electricity used to produce goods imported into the EU (including packaging, in some cases). If the imported goods are considered complex, the emissions are embedded in their precursors.

Importers are responsible for declaring the carbon footprint of the goods they import. To do so, they need to collect this information from their producers, who, in turn, are responsible for collecting similar information from their suppliers. This information may not be readily available and, critically, may not be possible to verify. Yet, in case of incorrect or insufficient information, 'liability lies with the reporting declarant'.[5] Only in specific cases and during the transitional period can the emissions embedded in imported goods be estimated using default factors – for example, emissions factors for electricity on a country-by-country basis. After 1 January 2026 the use of default values will be progressively disincentivised by applying a markup.

When the CBAM definitive regime takes effect in 2026, businesses will be required to purchase CBAM certificates proportional to the carbon footprint of the goods they import (as estimated above). The price of the CBAM certificates will reflect the actual market value of the corresponding ETS allowances, thereby imposing on imported goods the same carbon costs they would incur if they were produced in the EU, given the same amount of embedded emissions.

The idea behind the CBAM is that imposing the same carbon-related costs on imported goods as applied to domestic goods will create a level playing field *in the EU market* (a crucial specification that will be addressed in the following paragraph). For this reason, the implementation of the CBAM is aligned with the phase-out of free allowances (starting in 2026) under the ETS. Under the current system, while carbon allowances are ordinarily auctioned, some energy-intensive, trade-exposed sectors benefit from the distribution of free allowances. This is intended to protect these sectors from the risk of 'carbon leakage', i.e. delocalisation caused by excessive energy costs (driven by the need to pay for carbon emissions).[6] Ideally, when the CBAM is fully operational, EU-made products will no longer require special protection from unfair competition from abroad.

This logic works well in theory but not in practice. The main effect (indeed, the main goal) of the CBAM is to increase the price of covered goods by the cost of the carbon used in their production. When emissions cannot be avoided in productive processes – or can only be avoided at an

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[4] 'Carbon Border Adjustment Mechanism,' European Commission, 28 March 2025 (https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en).

[5] 'Carbon Border Adjustment Mechanism (CBAM): Questions and answers,' Last updated on 17 December 2024 (https://taxation-customs.ec.europa.eu/document/download/013fa763-5dce-4726-a204-69fec04d5ce2_en?filename=CBAM_Questions%20and%20Answers.pdf).

[6] 'Free allocation,' European Commission, n.d. (https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/free-allocation_en#faq).

unsustainable cost – the the carbon cost will be fully embedded in the price of the covered goods. This applies to both imported goods (that will be subject to the payment of CBAM certificates) and domestic goods (that will gradually lose access to free allowances). If Europe were a closed economy, then the main effect of the CBAM would be to increase the price of the covered goods, thereby incentivising demand reductions and/or production changes aimed at reducing their carbon footprint. However, the EU is emphatically *not* a closed economy; it imports several goods beyond those covered by the CBAM. Indeed, the latter are mainly intermediate goods that are not sold directly to end users; instead, other producers purchase them for assembly or further transformation. For example, steel and aluminium are used by several manufacturers of other goods, including (but not limited to) vehicles, power generators, and so on.

This means that the CBAM does not apply to products down the value chain, even though they contain some of the intermediate products covered by the CBAM regulation. To put it bluntly, the CBAM will level the playing field in the EU steel market, reducing competitive disadvantages for domestic producers resulting from the direct or indirect effect of climate legislation. However, the CBAM will not similarly benefit any downstream market, for example, the market for wind turbines. Since the effect of the CBAM is to increase the price of steel in the EU via the application of ETS prices and the phase-out of free allowances (whether domestically produced or imported), wind turbine producers abroad will gain a competitive edge because they will have access to cheaper steel in their own markets.[7] This would stem from the application of CBAM to intermediate goods but not to downstream products. Ultimately, this would make EU-made products even *less* competitive, not *more*.

One potential response under consideration is the extension of CBAM to a wider range of downstream products – something the Commission is reportedly open to, according to some rumours. However, such proposals are unlikely to resolve the core issues. The reason is straightforward: the broader the scope of goods covered by CBAM, the more complex both its implementation and the assessment of the actual carbon footprint of imported goods become.

It is already difficult to assess the carbon footprint of relatively simple inputs like steel or aluminium produced abroad. Estimating the real carbon content of a complex product – such as a vehicle – is exponentially harder. This would require calculating the carbon content, including indirect emissions, of each individual component (which may originate from multiple countries), their precursors, and the emissions generated during assembly, which could also take place in different locations.

Beyond these administrative complexities, applying CBAM to both components and finished products would likely increase the cost of both—potentially by a significant margin. At a minimum, this would erode consumers' purchasing power within the EU, as the prices of countless goods would rise without delivering meaningful environmental benefits. It could also incentivize domestic firms to relocate production overseas to exploit information asymmetries surrounding emissions and production processes at various stages.

Even if these challenges could be addressed, two major concerns remain. First, the ultimate aim of the policy – to raise the cost of any product with a non-zero carbon content – could have far-reaching consequences. While difficult to predict in full, at the very least, EU producers would become less competitive globally in goods manufacturing (a sector where the EU currently excels), and EU consumers would find themselves poorer, with diminished access to capital goods. Unless such goods can be produced more cheaply with minimal environmental impact – a transition that, if feasible, would likely occur without CBAM – the policy may offer little added value.

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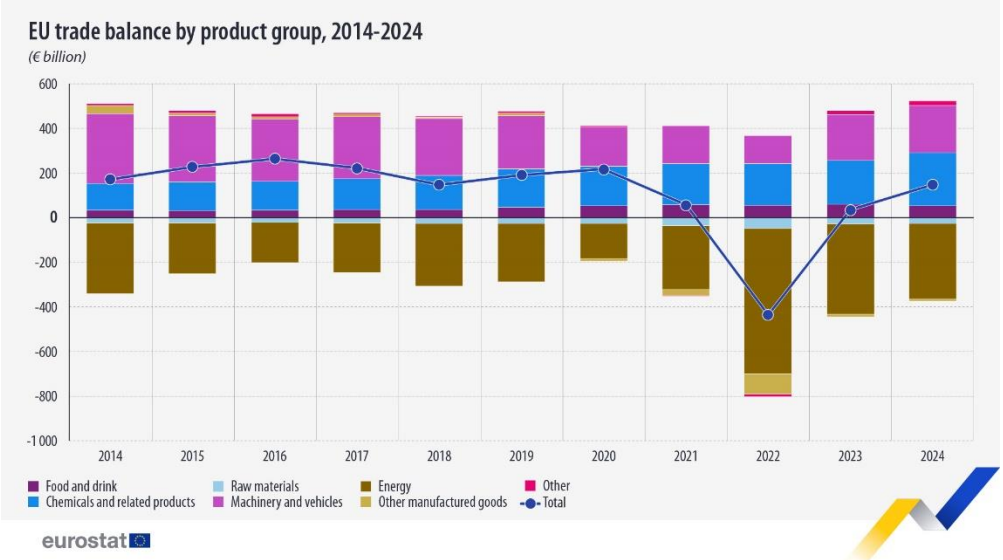
[7] 'CBAM may cost each offshore wind turbine near EUR 1m – lobby,' MontelNews, 2 October 2024 (https://montelnews.com/news/5557280e-68f4-487c-a7b8-6b55ed3ae041/cbam-may-cost-each-offshore-wind-turbine-near-eur-1m-lobby).

Second, developing and implementing such a far-reaching regulatory framework would take considerable time. The prolonged CBAM transitional period under its current, limited form is already evidence of this. If the system's rollout were to increase the risk of carbon leakage in the short term (e.g. starting in 2026), while its protective benefits materialize only later, the policy's effectiveness could be undermined before it has the chance to deliver any measurable results.

Additional hidden costs of CBAM

The effects of the CBAM are not limited to the domestic market, however. It will also have consequences for the competitiveness of EU producers abroad. The EU, in fact, is a manufacturing powerhouse. In 2024, the EU had a trade surplus of €147 billion, with total exports of as much as €2.6 trillion. The largest exporters to extra-EU markets were Germany, Italy, France, and the Netherlands. The largest export markets were the US, China, and the UK. The trade surplus in goods was led by machinery, vehicles, and chemicals, all of which are energy-intensive products.

Figure 1: EU trade balance by product groups, 2014—2024



Source: Eurostat

This remarkable achievement has been secured despite the high cost of energy and the increasing costs that EU manufacturers bear to offset their carbon emissions. A key ingredient in maintaining the competitiveness of European businesses in world markets has been the distribution of free allowances, which are precisely intended to prevent carbon leakage. According to the EC,

> the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions. The risk of carbon leakage may be higher in certain energy-intensive industries.[8]

Free allowances serve as a compromise – preserving environmental incentives t from the ETS while protecting EU companies from foreign competition. In principle, EU allowances are auctioned so that they can be allocated to those who value them the most (i.e. those with the highest marginal

[8] 'Carbon leakage,' European Commission, n.d. (https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en).

emissions abatement costs). The auction process promotes price discovery, which is further refined in secondary markets. However, in some sectors, which are both energy-intensive and trade-exposed, the need to pay for CO_2 might drive businesses out of the market because their foreign competitors do not face the same costs. Should that happen, the EU would suffer economic damage (i.e. plant closures and layoffs), which would not necessarily result in an environmental benefit. Delocalised manufacturing might move to other countries, such as the US or China, with lower emissions standards, where the goods will be produced with equivalent or higher emissions. After intense debates on how to address carbon leakage, free allowances emerged as a reasonable response – and it still is. A key aspect is that free allowances do not remove the incentive to reduce emissions if it can be done at a competitive cost. Assume, for example, that a steel producer receives an allowance for free, and the price of allowances in the secondary market is €75/ton CO_2. If the producer can reduce emissions at a lower cost (say, €50/ton CO_2), it will have an incentive to reduce its emissions and sell the allowance to third parties with even higher abatement costs.

As the CBAM comes into force and free allowances are phased out, EU producers will have to buy their own allowances. The phasing out of free allowances is expected to commence in 2026 and be completed by the end of 2034. In the domestic market, this may help level the playing field for EU businesses though downstream producers will be negatively impacted. However, this does not apply abroad; if the European manufacturer sells its products in a foreign market where CO_2 emissions are loosely regulated, its production costs (which include the need to purchase allowances) may be too high to be competitive. Even if this is not the case, higher costs in competitive markets would translate to lower margins, thereby reducing the incentive to continue manufacturing in the EU (Stagnaro 2020).

In other words, even if we optimistically assume that CBAM will work well within the EU internal market, it may result in reduced competitiveness for European manufacturers abroad. Of course, the same applies to European producers downstream. A European machinery producer shall have access to more expensive inputs within the EU, thereby driving up the production costs of goods such as machinery, vehicles, and chemicals. It follows that the CBAM might incentivise businesses to relocate their production processes abroad, not only for the goods covered by the regulation, but also for goods down the value chain that use the covered products as intermediate inputs.

The CBAM is intended to protect EU companies from foreign competition within the European market; however, it may well damage EU companies in foreign markets.

CBAM, in a time of trade tensions

The above considerations apply to the CBAM in an idealised world, but what happens when the CBAM is applied in the current state of affairs?

CBAM supporters argue that it is compliant with international trade rules. That is far from obvious, as many experts have warned since the beginning.[9] As a matter of fact, several countries have raised concerns that the mechanism might introduce significant trade distortions.[10] Distortions may arise through four main channels: i) trade diversions, i.e. the implicit incentive for businesses (either from the EU or from outside the block) to shift production to countries with little or no carbon pricing or to circumvent the CBAM; ii) retaliatory measures by countries that are affected the most by the

[9] 'The European Union's carbon border mechanism and the WTO,' Bruegel, 19 July 2021 (https://www.bruegel.org/blog-post/european-unions-carbon-border-mechanism-and-wto).

[10] 'European Union – Carbon Border Adjustment Mechanism (ID 148),' World Trade Organization, n.d. (https://tradeconcerns.wto.org/en/stcs/details?imsId=148&domainId=CTG).

new rules; iii) uneven impact within the EU, with greater impacts on countries or sectors that depend on goods imported from high-carbon markets; iv) a further fragmentation of international trade.

While channels i) and iii) may be somewhat addressed by closing existing loopholes in the CBAM and by introducing some flexibility in its implementation, channel ii) is entirely independent of the EC and other EU institutions' ability to intervene. In a period characterised by strong trade tensions and uncertainty, the introduction of such an instrument may provoke other countries to implement further restrictions. These include Iran, Ukraine, the UAE, the Russian Federation and, most notably, China and the US (Overland and Sabyrbekov 2022). While in normal times, the EU might engage in negotiations to strike a middle ground – for example, by promoting technology transfers to developing countries to help them reduce their carbon intensity in the covered sectors – in the current environment, the risk of escalation is high, especially by external countries using the CBAM as a pretext for implementing more protectionist responses.

It is also unlikely that the EU will succeed in persuading foreign jurisdictions to follow its lead in enacting climate legislation, given the current shifting priorities at the global level. But if it does – and after all, a few countries are following suit[11] – it is not evident that this will result in greater convergence. In fact, while different countries may agree to adopt some form of carbon border adjustment based on common criteria, implementation details are key, and they may result in vastly different effects, depending on how they are defined as well as the arbitrage (if not gaming) opportunities between CBAM-compliant countries. This might indeed lead to a more fragmented trade landscape rather than a more sustainable one (channel iv).

The distribution of free allowances to energy-intensive, trade-exposed sectors may be an imperfect solution, but it is effective, has limited distortions, is consistent with Europe's climate goals, and is a non-controversial policy tool, both within the EU and abroad. Reducing the scope of further trade conflicts should be viewed as a priority.

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[11] For example, see: 'Factsheet: Carbon border adjustment mechanism', 24 April 2025 (https://www.gov.uk/government/publications/factsheet-carbon-border-adjustment-mechanism-cbam/factsheet-carbon-border-adjustment-mechanism).