CLIMATE FRIENDLY MATERIALS PLATFORM

Climate Contribution and its role in European industrial decarbonisation

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POLICY BRIEF

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WiseEuropa Institute is an independent think-tank and research organisation based in Warsaw that undertakes a strategic reflection on European politics, foreign policy and economy.

About the Climate Friendly Materials (CFM) Platform

The Climate Friendly Materials (CFM) Platform analysis the transformation of basic material production and use to achieve carbon neutrality by 2050. Its collective aim is to aid progress toward nationally-led industrial decarbonisation policy frameworks compatible with long-term EU strategy, and to capture the potential of a just and inclusive clean energy transformation.

Convened by Climate Strategies, the CFM Platform facilitates exchange between leading analysts, policymakers, industry leaders and other relevant stakeholders. It brings together leading think tanks and university research groups in Belgium, France, Germany, Hungary, the Netherlands, Poland, Spain and Sweden to enhance Europe's analytic understanding of how individual instruments fit together into a coherent policy package.

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1. Introduction

The European Union set out on a journey to build a competitive climate neutral economy by 2050. This requires transforming not only our energy system, but also the way in which we produce and use basic materials such as steel or cement. As low-carbon material production is typically more expensive than conventional processes, the climate policy needs to address several challenges. First, it needs to incentivise investments in climate-friendly processes without triggering carbon leakage on the supply side. Second, an efficient policy framework has to ensure that material users have incentives for more effective material use and thus contribute to the more resilient value chains and local jobs while reducing their material carbon footprint. Furthermore, to be effective on a global level, the EU climate policy must provide an attractive example for other parts of the world towards joining the effort of decarbonising material production and use. It is discussed, whether this should also involve increasing the cost of inaction (e.g. by extending internalising carbon pricing or product standards to not only cover domestic production but also imports) or by decreasing the barriers to shifting to climate-friendly material solutions (e.g. by increasing the pace of development of industrial low-carbon technologies).

The Climate Friendly Materials (CFM) Platform proposes a package of industrial decarbonisation instruments in its publication "Building blocks for a climate-neutral European industrial sector" (CFMP 2019). In this policy brief, we focus on one major component of this package: introducing the climate contribution to complement the free allocation in the EU Emissions Trading System (EU ETS). This concept builds on earlier work within the "Inclusion of Consumption in the Emission Trading" project (Climate Strategies 2016), which already explained in detail how such instrument may be introduced. Thus, in this policy brief, we aim to clarify the concept and explain why it can be a viable option to meet the policy objectives of Carbon Border Adjustment Mechanism in a way that has major advantages compared to alternative instruments focusing on border measures.

2. How can a consumption-based instrument address the carbon leakage?

2.1 Revisiting free allocation

The core element of the European climate policy is the EU Emissions Trading System launched in 2005. It obliges the EU producers in emission-intensive sectors to cover all their greenhouse gases emissions with allowances issued by the regulator. The total number of allowances is capped and decreases every year. Whilst a large proportion of allowances is auctioned off, the rest is allocated freely to the major producers based on product benchmarks, which are gradually decreased over time. This free allocation is granted to the basic materials industries[1] which are particularly threatened by competition from countries with laxer emission constraints, thus reducing the risk of carbon leakage. Producers who reduce their carbon footprint in line with ever stricter sector benchmarks are able to sell their spare allowances, so that they can be purchased by other companies who may not be able to reduce their emissions so easily. Consequently, the price of allowances is determined by supply and demand. In principle, this mechanism is intended to incentivise producers to transition towards more climate-friendly technologies.

Free allocation and windfall profits

From the beginning of the EU ETS, the level of freely allocated allowances was based on the principle of *grandparenting*, i.e. it depended on the historic emissions volumes. Initially, this system was relatively static: a successful carbon innovation would not affect the free allocation in the immediately following years. This rewarded the carbon mitigating innovators for an extended amount of time. Policy adjustments in consecutive phases of the EU ETS however have consistently shifted it towards the dynamic free allocation, i.e. the number of allowances allocated for free to the industrial installations was gradually aligned closer with actual production levels. The specific number of free allowances for the installations is calculated based on production data, emission performance benchmarks, and a carbon leakage exposure factor measuring the exposure of the industrial sectors to international competition and carbon leakage risk. This factor is equal to 100% for the vast majority of basic materials producers.

As a result of the free allocation mechanism becoming more dynamic, a producer who reduces their production level significantly in a given year can no longer expect to receive free allowances for a number of years. Under the static free allocation such resulting surplus of allowances generated the so called *windfall profits*. Moreover, designing the free allocation mechanism faces a trade-off. On the one hand, precise targeting of sectors exposted to carbon leakage involves a high administrative burden. On the other hand, simpler mechanisms lower the administrative burden, but might lead to situation when the sectors highly exposed to the carbon leakage are not adequately protected, whilst at the same time other sectors enjoy windfall profits. Although the free allocation mechanism is still not fully dynamic, as the level of free allocation for a given plant in 2021-2030 will be adjusted when its production levels shift 15%, the modifications of the mechanism introduced so far have already significantly reduced the problems associated with grandparenting in previous years, such as the issue of windfall profits[2].

1. For an exact list of covered industries see https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D0708&from=EN
2. For a more detailed comparison of various free allocation mechanisms see https://ec.europa.eu/clima/sites/clima/files/ets/revision/docs/impact_assessment_en.pdf

As free allocation is increasingly dependent on actual production levels, the producers can no longer expect to receive a similar number of allowances after reducing their output significantly. The static free allocation can create an incentive for the producers to reduce output and retain extra free allowances, especially when the value of free allocation constitutes a significant share of the price of the final product. This may lead to upward price pressure, particularly for less tradable goods or when imports are also covered by carbon pricing. In that case, the carbon price signal which will be passed from producers to consumers will cover total emissions from producing a given material, including both the opportunity cost of free allowances and the cost of purchasing the rest of required allowances in the market[3]. This effect is absent under the dynamic allocation, as reducing output does not generate a surplus of free allowances. In this case, only emissions above the benchmark generate additional costs for producers, which then can be passed through to consumers. Consequently, even though the shift towards the dynamic allocation alleviates the issue of windfall profits and improves protection against carbon leakage, it also has an adverse effect of weakening the carbon price signal on the demand side (Neuhoff and Ritz 2019).

Free allocation and long-term decarbonisation

Should the EU retain the free allocation scheme, one can wonder if the total number of freely allocated allowances would not exceed the EU-wide cap on emissions. We believe that this is unlikely. As the cap decreases and allowances become scarcer, their price increases. This in turn leads to increasing opportunity costs of maintaining the conventional production processes and using up freely allocated allowances instead of switching to low-carbon alternatives and selling freely allocated allowances on the market. Note that the incentive arising from a sufficiently sized free allocation under a high ETS price is to switch to the EU-based low-carbon production process rather than to relocate production outside the EU, as in the latter case the producer will lose their free allocation. Thus, the free allocation scheme has the potential to contain carbon leakage provided that its benchmarks are set at appropriate levels.

In the absence of an alternative instrument for carbon leakage protection, the role of the free allocation mechanism would be to balance the competitive disadvantage of European producers operating under the EU ETS compared to their foreign competitors. Otherwise, without free allocation, European producers would incur the full carbon costs of the EU ETS. In the long run, these would become the ongoing operating costs of climate-friendly technologies (e.g. installing and operating CCUS installations or switching to and using clean hydrogen, which is more expensive than fossil fuels) rather than the surrendered emission allowances[4]. The method of calculation of free allocation in the future will need to take into account this role of the scheme by adjusting the benchmarks to the level of the best conventional production processes predominant on the global market. As the situation on the global market evolves (e.g. widespread adoption of low-carbon production processes), the benchmarks may be reassessed and corrected. This approach however creates the possibility that the total free allocation exceeds the cap at some point in the future. If producers switch to low-carbon production processes, their actual emissions would be well below the free allocation that they receive. Should this occur however, the government could buy the surplus freely allocated allowances on the secondary market or provide a direct payment based on the market value of allowances to be freely allocated. We should emphasise that such a system would require fine tuning in calculating the appropriate benchmarks and the accompanying free allocation.

Thus, allocation of free allowances does not mean that the sector covered by this scheme will not decarbonise. The producers still have strong incentives to introduce low-carbon processes as the cap tightens. The fact that this effect has not materialised in the EU yet may be explained by low EU ETS prices (compared to costs of introducing industrial decarbonisation technologies) and uncertainty about the prices in the future, as well as high uncertainty regarding the prospects of maintaining the free allocation.

3. For a more detailed discussion on the equivalence between auctioning and grandfathering, see Branger et al. (2016)

4. As this cost of compliance will depart from increasing EU ETS price (e.g. primary production of material A is fully decarbonised at a cost 70 EUR/t while allowance prices rise to 100 EUR/t to incentivise further reductions for material B), the benchmarks may be adjusted downwards to reflect this development and avoid accusation of domestic industry protection from trading partners.

Structural weaknesses of free allocation

The fundamental problems with the current approach to free allocation are not related to its inherent inability to deliver deep decarbonisation of material producers or tendency to generate windfall profits for the industry. As discussed in previous sections, both these issues can be addressed by fine-tuning the rules governing the EU ETS. There are, however, two structural problems with maintaining the free allocation:

i) The **free allocation mutes the carbon price signal on the demand side** by reducing carbon cost pass-through; prices of materials, as well as intermediary and final goods produced from them do not reflect the full carbon costs (either cost of emitting CO_2 or decarbonising production processes). This leads to underinvestment in material efficiency and insufficient interest in substitution towards less carbon-intensive materials and enhanced recycling. These mitigation options are essential for the economic and social success of the industry transition, as they secure local jobs, limit the need for resources and—in particular—energy imports, and reduce the overall costs of the transformation;

ii) In the long run, the **government may potentially need to provide additional funds from outside the EU ETS system** to maintain the free allocation, as the pool of new allowances available for distribution decreases with the cap. A system relying on such long term financial support is unlikely to gain credibility among investors considering climate neutral production processes.

These two critical issues need to be addressed in the EU's future climate policy. In the following section, we explain how the proposed addition of the climate contribution to the EU ETS solves both problems, by providing appropriate carbon price incentive on the demand side and ensuring that, on aggregate, climate action in the materials sector will not be a drain on the public budget.

2.2 Complementing free allocation with climate contribution – how does it work?

The climate contribution is a proposed weight-based charge on consumption of carbon-intensive materials sold for final use in Europe. It is linked with the EU ETS, as its level depends on the market prices of emission allowances and product benchmarks. The climate contribution complements dynamic free allocation by passing through the carbon price signal to material users, as well as raises additional funds which can be used for supporting climate action.

The climate contribution may be calculated in the following way (see Figure 1 for illustration):

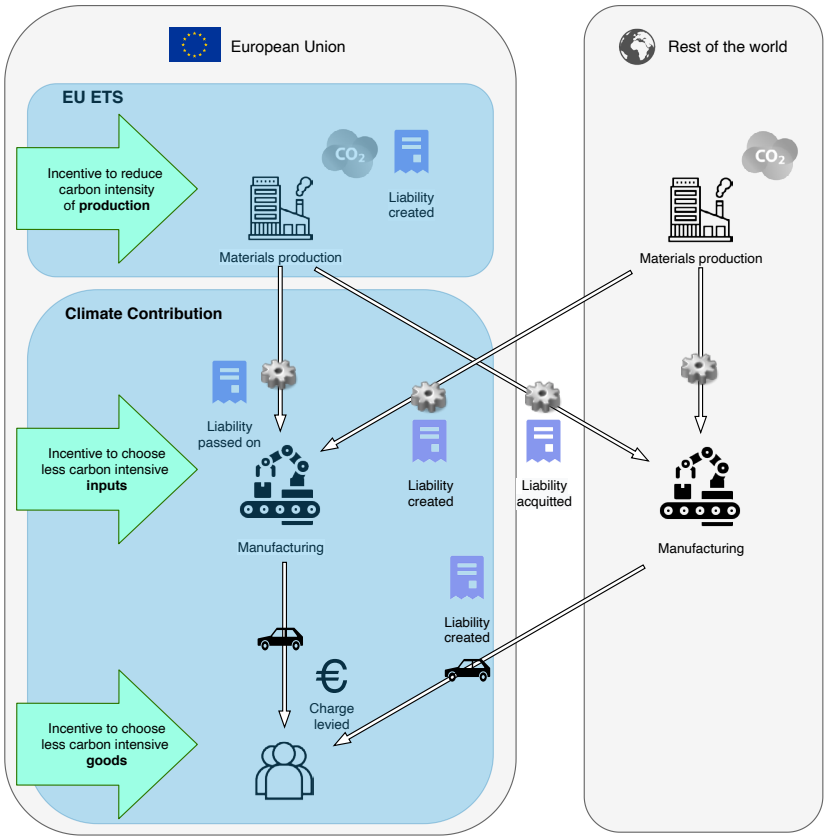
- Production of selected basic materials will generate a liability. The attached charge is going to be equal to the product of the following:
  - » product weight,
  - » corresponding product-specific benchmark value for primary production of the material in question (as opposed to, for example, a benchmark for electric-arc furnaces that are primarily used for recycling of steel), because additional material consumption triggers additional primary production,
  - » the price of EU ETS allowances, which is already available from allowance auctions, and could be updated on an annual basis to reduce the administrative burden for the firms.
- If the material is sold to an EU-based firm, the liability is passed on along with it. The liability can also be passed for material as part of a product – again proportionally to the weight of the carbon-intensive material in the product.
- If at any stage the material is exported outside of the EU, the liability is acquitted.
- A firm will pay the liability, if it sells the material to a domestic consumer or a domestic firm that does not envisage exports.
- Finally, if a good containing any of the materials liable for the climate contribution is imported into the EU, a liability is created too and passed on according to the above procedure.

In practice, the above procedure may be further simplified, by covering only the upstream part of the supply chain for most of the products. For example, consider a manufacturer further downstream the value chain, who purchases inputs carrying a climate contribution liability. The manufacturer may decide to settle the climate contribution payment due on their product, in particular when the product is envisaged for the domestic EU market and the value of the liability is low relative to the value of the product as well as relative to administrative cost of passing the liability down the supply chain. Unlike in the case of border-focused measures, there will be no need to establish the fixed list of sectors which are covered by this solution. Instead, the policy may rely on self-selection: the companies will be able to decide themselves whether they prefer to incur the cost of climate contribution or the additional administrative effort of passing the liability down the supply chain.

The introduction of the climate contribution might raise concern over the distributional effects of such a measure, as it can be perceived as adding a new burden on the consumers while maintaining free allocation of allowances to producers. Note, however, that this policy option delivers a simple pass-through of carbon cost from producers to consumers via a regulatory instrument, especially if the free allocation is further shifted towards a fully dynamic mechanism. Such mechanism would eliminate the risk of a double pass-through of carbon cost, as it weakens the demand side price signal (as explained in section 2.1). In fact, one of the key impacts of introducing a full auctioning combined with a border-focused measure such as border carbon tax will also be enabling carbon cost pass-through from European producers to consumers, leading to higher prices of basic materials. As mentioned in the previous section, without passing the carbon signal to intermediate and final consumers, society as a whole will need to bear a higher cost of industrial decarbonisation due to the lack of incentives to realize demand-side and recycling opportunities.

FIGURE 1

Outline of a Climate Contribution mechanism



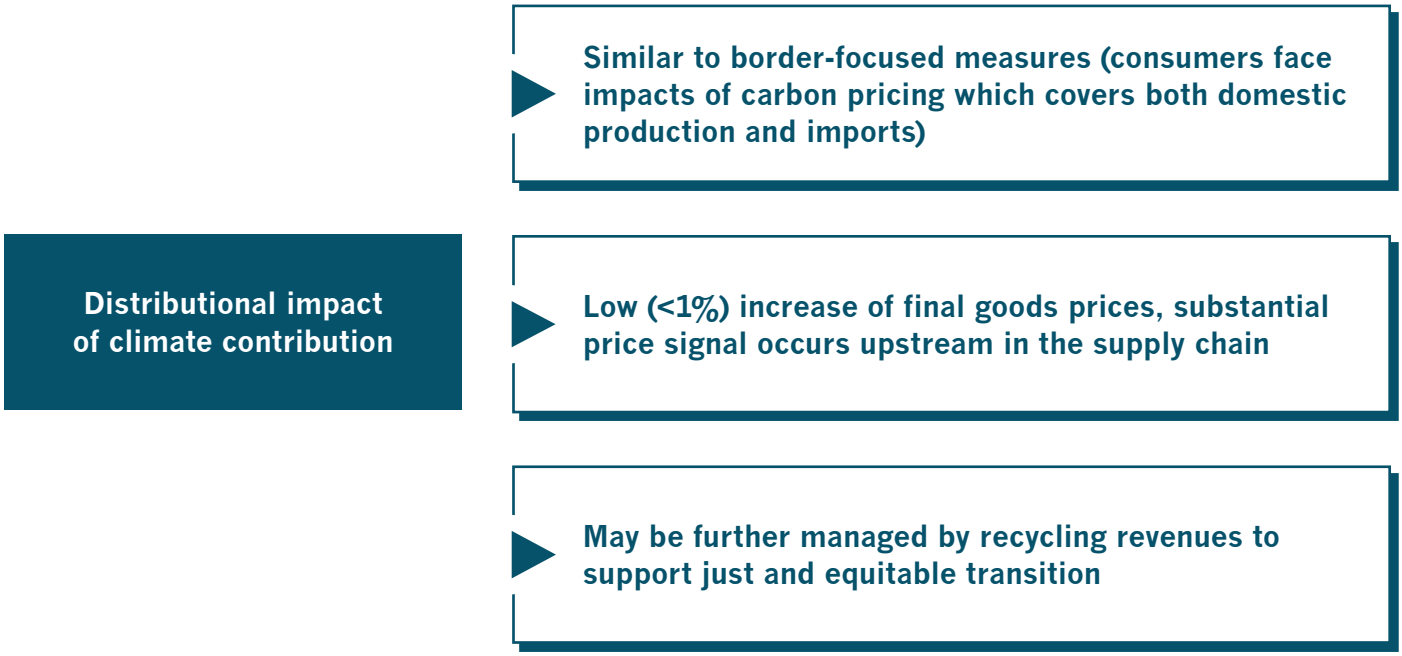
Source: WiseEuropa based on Climate Strategies (2016)

Two further points may be considered when assessing distributional perspective of full carbon cost pass-through. First, the materials share in total costs of final goods is typically low. For example, Rootzén and Johnson (2017) show that applying carbon costs to cement leads to the increase in total costs of constructing the residential building up to 1%, even in the cases where the cement price was assumed to almost double. Similarly, Material Economics (2019) estimates that costs for end-users increase by less than 1% after introducing net-zero technologies in cement, steel and chemical industries (e.g. +0.5% increase for a car and +1% increase for a packaged soft drink). The reason is the dominant role of labour and capital cost, as well as the length and complexity of the modern industrial value chain.

In other words, the price of the final product is primarily determined by the value added through processing it across entire supply chain. At the same time, even marginal increases in material prices which are not noticeable to consumers may incentivise manufacturers of intermediate and final goods to adjust their production processes and design of products. Second, the climate contribution raises additional revenue, which may at least partly be used to address distributive concerns and support the decarbonisation of the European economy in an equitable way, countering any potential (and limited) regressive effects of the policy.

FIGURE 2

Distributional impact of climate contribution



Source: WiseEuropa

3. CBAM alternatives: border-focused measures versus climate contribution

An effective carbon pricing mechanism for decarbonising the material sector should meet three key requirements. It should:

1) move the EU towards reaching climate neutrality, in particular by providing a clear price signal covering both material production and use inside the EU,
2) be robust and implementable, where robustness includes avoiding the risk of carbon leakage,
3) support the global climate action; whilst countries are responsible for their own emissions in the spirit of the Paris Agreement, the EU's leadership in the material sector could potentially accelerate the global decarbonisation efforts to a significant degree.

Integrating the climate contribution into the EU ETS can be seen as a way to achieve the goals of the Carbon Border Adjustment Mechanism (CBAM), which is currently considered by the European Commission. As indicated by the EC in its public consultations, the CBAM may be designed both as a measure introduced at a border (either as a direct border charge or an extension of emission allowance trading) and as a consumption charge (which covers both domestic production and imports). Under the border-focused option, imports are charged and exports are potentially (but not necessarily) reimbursed, while the domestic consumption charges imposed in the latter option by definition cover imports and exclude exports, similarly to VAT or excise taxes.

In this section, we present three scenarios for introducing the border-focused CBAM[5] in the EU and next we compare them to an option based on introducing climate contribution within the EU ETS. We argue that the latter solution provides a viable alternative.

CBAM option 1:

Idealistic border-focused measure with free allocation phase-out

The idealistic border-focused measure would involve a border charge or a similar mechanism which is directly proportional to the imported goods' content of the selected basic materials and their emissions intensity. Such a system would cover the full depth of the value chain, i.e. all goods which enter the EU, regardless of whether they are intermediate or final. This also implies that exports reimbursements for the goods leaving the EU would be necessary, as otherwise the goods crossing the border multiple times would be also charged each time.

Whilst this is a tempting vision, it is marred by the difficulty in measuring the exact emissions associated with a product comprising components that may come from many countries using different manufacturing technologies, which are subject to laxer climate policies. Even if such a system of measurement is successfully implemented, it creates major risks. The first one is carbon leakage downstream risk of resource shuffling. This occurs, when manufacturers—instead of reducing their overall carbon intensity—rearrange their distribution channels so that the "clean" production is exported to the EU, whilst the "dirty" production is redirected for the domestic sales. As a result, the overall emissions reduction might be lower than projected and carbon leakage protection for EU producers is undermined.

Moreover, this option would require an administratively costly system of verification which would need to reach beyond the EU borders to ensure that the declared carbon footprint of imported basic materials is accurate (Lehne 2020).

5. We use the term "border-focused measure" rather than e.g. "border carbon adjustment" to differentiate specific subset of measures (the ones introduced at the border) from a broader set of instruments (including the ones focused on domestic market) which can constitute an effective CBAM. The border-focused measures cover not only import charges or export rebates, but also inclusion of imports in the emission trading system.

Another layer of complexity is adjusting the charge to reflect the stringency of the climate policy in the country of product origin. Climate action may cover various non-price instruments, such as environmental production regulations, which are not straightforward to translate into monetary values in a consistent and just way. This makes this option complex both technically and legally, which—we believe—is still an underappreciated aspect of the currently discussed CBAM. The multidimensional complexity of introducing the border-focused measure in its pure form is too high to make its implementation feasible in a foreseeable future.

CBAM option 2:

Realistic border-focused measure with free allocation phase-out

To simplify the above approach, the EU could establish a list of emission intensity benchmarks[6] which would apply to selected imported basic materials regardless of the country of origin. Whilst this would not allow for a distinction between more and less climate friendly production technologies, it would considerably reduce the administrative burden of levying the appropriate border adjustment. The stringency of benchmarks may be set at different levels: the higher the assumed level of emissions is, the stronger the protection of the European industry, but also the higher the risk of an international trade dispute. This risk may be mitigated by providing an option for importers to demonstrate that they achieve lower emissions than accounted for under the benchmark value[7].

The simplified approach also implies that it is technically feasible for border-focused measure to cover not only basic materials, but also manufactured products, given that the EU procedures already require importers to report goods' physical components. This means that the carbon footprint may be measured based on product weight and emission benchmarks.

This, however, significantly increases the risk of trade tensions as the list of products covered by border-focused measures grows longer and covers ever greater share of trade volumes: importers of manufactured goods may raise objections of unequal treatment compared to the European manufacturers.

Furthermore, the possibility of covering exports by CBAM in this scenario remains uncertain, as it is limited by WTO concerns. In particular, as the EU ETS is treated as a regulation rather than tax, providing export rebates to counteract its impacts will be not in line with the SCM (Subsidies and Countervailing Measures) Agreement (ERCST 2020).

The prospect of phasing out free allocation is causing concern among industry stakeholders, expressed in the European Commission's public consultations the carbon border adjustment mechanism.[8] The key issues highlighted by the industry include removing existing mechanism before the new solution is tested and proven in practice, as well as lack of carbon leakage protection for European exporters who will not benefit from the border-focused measures covering only imports to the EU.

CBAM option 3:

Realistic border-focused measure complementing free allocation

The concerns about a rapid shift to full auctioning for domestic producers combined with border-focused adjustment of imports may be alleviated by the gradual phase-in of this measure, with the CBAM as described in option 2 and free allocation co-existing in the short term. This option provides more regulatory certainty and covers European exporters in the short term, but does not provide a sufficiently strong carbon price signal on the demand side. The problem of weak carbon price signal on the demand side will disappear when the free allocation is fully phased out, but then the carbon leakage risk for exporters will reappear. This inconsistency implies the need for further regulatory action, and hence induces regulatory uncertainty and as such may inhibit or delay investment in low-carbon solutions.

6. Also referred to as "default values".
7. For a detailed review of various approaches to setting benchmarks, see the ERCST (2020) report.
8. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-EU-Green-Deal-carbon-border-adjustment-mechanism

CBAM option 4:

Climate Contribution complementing free allocation

The proposed combination of free allocation and climate contribution has several significant advantages compared to realistic variants of border-focused measures:

- **Low risk of trade conflict.** The climate contribution is levied without differentiation by production process or location. As a result, this policy complies with the principles of the World Trade Organisation, in particular the national treatment requirement under Art. III:1 and 2 of the General Agreement on Tariffs and Trade (GATT).
- **Maintaining level playing field for European exports.** Maintaining free allocation avoids carbon leakage risks while providing incentive to shift it to low-carbon technologies. Given that the free allocation is an integral part of the environmental regulation (EU ETS) rather than a dedicated export rebate, this solution also avoids the risk of breaching the SCM Agreement.
- **Low administrative complexity.** The required information is already available (benchmark values within the EU ETS, allowance prices) or easier to collect and verify than any carbon footprint information (unlike type of production process used, product weight is directly observable at the point of entry into the EU market).
- **Evolutionary reform of the EU ETS.** Climate contribution is not intended to replace the free allocation, but would rather complement it and refine the EU ETS. Consequently, this limits uncertainty for the industry associated with the reform.
- **Avoiding the risk of resource shuffling.** By covering material use and accounting for its marginal effect on primary production, climate contribution does not encourage simple redirection of materials produced outside the EU via low-carbon processes to the European market.
- **Avoiding the risk of carbon leakage spreading down the supply chain.** As climate contribution covers materials embedded in the components and final goods, price impacts of using carbon-intensive materials apply both to European producers and importers of goods. In contrast, applying border-focused measures on selected materials may lead to reallocation of their processing outside the EU. While this problem may be addressed by broadening the coverage of border-focused measure to processed goods, this in turn further raises the risk of trade conflict due to differentiated treatment of European producers and importers.

Overall, the legal and administrative complexities of implementing full carbon pricing for the domestic producers and adjusting the carbon price signal at the border increase the attractiveness of the alternative, i.e. addressing the carbon leakage risk at the point of domestic production (free allocation) and fixing the resulting carbon price distortion by introducing a consumption-side measure on the domestic market (climate contribution).

Finally, the lack of direct impact on the producers outside the EU may be perceived as an important weakness of introducing climate contribution. Indeed, the combination of climate contribution and dynamic free allocation creates a robust "bubble" of climate ambition for decarbonising both material production and use in Europe, but does not provide a direct incentive for other parts of the world to pursue industrial decarbonisation. It may serve, however, as a crucial indirect instrument to increase global climate policy ambition:

- the proposed policy framework stimulates low-carbon industrial technology development and provides incentives to switch to low carbon processes rather than reallocate production outside the EU. It provides a credible perspective that Europe will develop low-carbon industrial innovations and implement them at a large scale. This, in turn, means that more ambitious long-term policy measures such as introduction of low-carbon product standards (see CFMP 2019, Lehne and Sartor 2020) become a material risk for trade partners who do not develop their own low-carbon industrial base in time,

- the combination of supply- and demand-side measures delivering robust carbon price signal may be used as a regulatory template for other regions and countries who also wish to pursue rapid industrial decarbonisation but are concerned about the risk of carbon leakage.

Just as the European Commission has ended its public consultations on the CBAM and is planning to present its proposal in the second quarter of 2021, it is important that a broad set of alternative policy options is well-understood and discussed. Concentrating the public debate on the measures implemented at the border creates a serious credibility risk for European decarbonisation agenda if their implementation suffers any major technical or political setbacks. We believe that introducing climate contribution to complement dynamic free allocation offers a robust alternative to border-focused CBAM options and encourage policymakers and stakeholders to explore this solution in more detail.

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