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Climate Change and
Sustainable Transition

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Border Carbon Adjustments in the EU

Issues and Options

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Executive Summary

Overview. As part of the European Green Deal (EGD), the European Commission is currently elaborating a legislative proposal for a Carbon Border Adjustment Mechanism (CBAM) to prevent greenhouse gas emissions leakage and level the playing field between European and foreign emitters. This report brings together the main takeaways from the project 'Border Carbon Adjustments (BCAs) in the EU: Issues and Options' launched in November 2019 to provide analytical input and foster an informed debate with domestic and international stakeholders as the CBAM file progresses through the early stages of the legislative process.

Drawing on extensive feedback obtained in a series of stakeholder consultations, the report offers a detailed analysis of the building blocks of BCAs as a policy option in the European context, discusses alternative policy options, and considers different combinations of policy instruments to achieve the desired outcomes.

Methodology. The report applies a heuristic multi-criterion analysis to BCAs and breaks this policy instrument down into eight design elements, each with several implementation options. These options are assessed on the basis of five evaluation criteria: environmental benefit; competitiveness benefit; legal feasibility; technical and administrative feasibility; and political and diplomatic feasibility.

Three possible combinations of options are then developed and assessed through the same criteria as part of a scenario-building exercise: a 'most probable' scenario that reflects the limited information available to date in statements and documents of the European Commission and other relevant entities; a 'play it safe' scenario that seeks to minimise legal and political risk as well as technical complexity; and an aggressive 'go getter' scenario that seeks to maximise environmental and competitiveness benefits. Finally, two additional policy instruments, consumption charges and carbon contracts for difference, are evaluated using the same criteria matrix, and each instrument as well as combinations thereof assessed and compared with a view to understanding how well these might achieve the goals of the prospective CBAM.

Context. Europe's CBAM is being elaborated as we approach several important crossroads, and that is no coincidence: EU climate ambition is likely to see a step change with the European Green Deal; international negotiations are on hold, affecting the process in which countries are required to present new, more ambitious climate pledges; and the outcome of the upcoming U.S. presidential election will have far-reaching ramifications for climate action everywhere. The outcomes of these parallel processes will profoundly affect the political dynamic of the CBAM proposal and its discussion in the relevant EU institutions. It is important to recognize, therefore, that the entire EU CBAM process is still shrouded in a lot of uncertainty, but also that the timeline for putting in place a solution is rapidly shrinking.

Raising ambition and solving leakage are intertwined. There are two intertwined inevitabilities in play: the continued increase in the ambition of EU climate action, and finding new ways to deal with carbon leakage and competitiveness. The EU's announced global leadership on climate is welcome and globally necessary, but it is unlikely to materialize unless Europe finds a solution to the leakage and competitiveness problems that come with getting out ahead of trading partners. Finding a new solution to carbon leakage and competitiveness may not be a sufficient condition, but it is a necessary one.

CBAM: A silver bullet? The EC is pinning its hopes on border carbon adjustment—long considered, never adopted—as a solution, and has set in motion the processes to move it forward. This puts a lot of pressure on an instrument that can be useful, but is no silver bullet; it faces challenges that will need to be addressed before it can be adopted. The CBAM will need to work within a framework that will emerge at different levels in the EU.

Political challenges. While trade partners may reflexively push back against the CBAM, the EU is not alone in facing the challenges of leakage/competitiveness. Those partners also have to find a solution, and that creates opportunities for cooperation if the EU manages the diplomatic dimension well. International informal consultations in the context of this project have revealed two main findings: there is awareness but not belief externally (and maybe domestically) that a EU CBAM will happen; in other words, the inevitability of a CBAM is not yet accepted; there is opposition but also an unexpected level of acceptance that, given the shifting attitudes towards climate change around the globe, some solution to the leakage problem is needed, and that there needs to be a dialogue to make CBAMs a cooperative and not an adversarial approach.

Legal challenges. Concerns about WTO compatibility tend to focus on whether a BCA would violate free trade disciplines contained in the General Agreement on Tariffs and Trade (GATT). Any effective BCA would almost inevitably breech GATT's provisions on non-discrimination, because it is by definition meant to differentiate between low- and high-carbon goods that are otherwise comparable, or "like". The real legal battleground thus is GATT Article XX with its environmental exceptions, which could allow such a breech. But meeting the conditions of that provision is a demanding proposition. The environmental motivation of the BCA becomes key, but so does the process, which has to be fair, transparent and inclusive.

Design challenges. There are a number of balances that need to be addressed in finding a solution: addressing carbon leakage is not enough without addressing competitiveness; both external and internal competitive aspects need to be addressed if a solution is to be considered viable. Many policy options to ensure the competitiveness of European exports are also legally vulnerable. Continued free allocation under the EU ETS when a CBAM is in place, or applying a CBAM to exports by remitting the costs of ETS compliance, risk being considered a prohibited export subsidy under the WTO's Subsidies and Countervailing Measures (SCM) Agreement. Some BCA design choices that minimize legal risk and the potential for political backlash entail

trade-offs in the environmental or competitiveness benefits they afford. Still, there are designs that offer a good balance between environmental and competitiveness benefits, on the one hand, and legal and political risk, on the other. Several design choices can minimize the administrative burden on the EU, in particular reliance on default values for imported products. The most intractable challenges may relate to crediting of foreign policies, managing avoidance strategies such as resource shuffling and trans-shipment, and addressing impacts on the competitiveness of downstream EU producers.

Going forward. The framework that will emerge over time, not through one single legislative initiative, could include various components such as contracts for difference, consumption charges and standards. There are a number of different objectives that need to be met, and there will be different instruments to meet them.

1. Introduction

1.1 Background

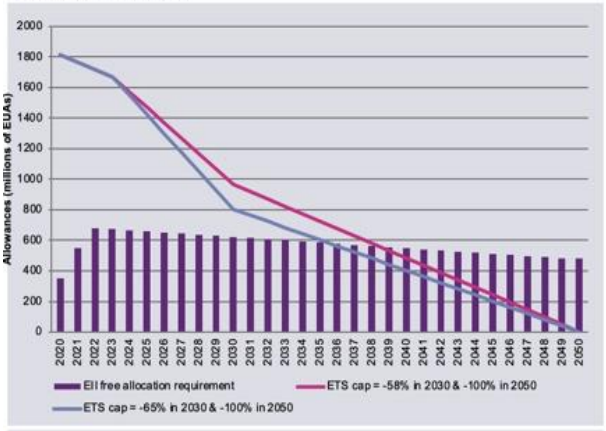
The issues of carbon leakage and competitiveness have always been major preoccupations for the policy makers and stakeholders involved in the debate on decarbonization and meeting the international commitments of the European Union (EU) on climate change. The EU has dealt with these issues in the context of carbon pricing through the EU emissions trading system (EU ETS) by means of the free allocation of allowances, which are currently granted to sectors regarded as being at significant risk of carbon leakage.

Up till Phase 3 of the EU ETS, a sector was deemed at risk if the implementation of the EU ETS increases production costs (based on value added) by more than 5% and the trade intensity with non-EU partners is above 10%[1]. The revision for Phase 4 introduced a new methodology to assess the risk of carbon leakage, based on the product of a sector's trade intensity and emission intensity. If this 'carbon leakage indicator' exceeds the 0.2 thresholds set out in Article 10b(1) of the ETS directive, the sector will receive 100% of their allocation for free (at the benchmark). For less exposed sectors, free allocation is foreseen to be phased out after 2026 from a maximum of 30% to 0 at the end of phase 4 (2030).[2]

So far, the risk of carbon leakage has been muted to a large degree, partially due to the economic crisis, partially to the method of free allocation which, overall, has led to overallocation in the past. This situation is coming to an end with increased scarcity and rising prices, and the reduction of available amounts of free allocation, as explained in the State of the ETS Report[2] and in the graph below[3].

The total amount of free allocation available is currently capped by a defined percentage of the yearly available allowances (the 'cap'). Depending on the future ambition of the EU ETS, this upper limit is expected to be insufficient to meet the demand for free allocation by the late 20s or early 30s, resulting in the application of the 'cross-sectoral correction factor'.

Free allocation and the EU ETS cap under higher EU 2030 ambition scenarios



Source: Agora Energiewende

[1] Carbon leakage, DG Climate Action, European Commission
https://ec.europa.eu/clima/policies/ets/allowances/leakage_en

[2] https://ec.europa.eu/clima/policies/ets/revision_en

[3] https://ercst.org/event/border-carbon-adjustments-conceptual-stakeholders-meeting-on-alternatives/

The graph below also shows that, even without taking into consideration the upper limit to free allocation that currently exists, future expected free allocation 'requirements' (based on current decarbonization trends) will be above the ETS cap after 2035 in higher ambitions scenarios (e.g. 2039 in the -58% scenario).

One of the objectives of the Paris Agreement, to hold the increase in global average temperature to 2°C above pre-industrial levels, aiming for 1.5°C, has contributed to the decision of the EU to examine its own pathways and legislation to reach carbon neutrality by 2050.

The proposed European Commission target of climate neutrality in 2050 has led to increased interest, and urgency, in examining options to address the risk of carbon leakage as well as measures to safeguard against it. The European Commission action plan, the European Green Deal (EGD), and the goal of net zero by 2050, with the EU ETS expected - according to senior Commission officials - to reach a net zero possibly as early as 2040, demonstrate the increasing ambition of the EU. On a global scale, those announcements are already highlighting that the asymmetry of climate efforts around the world will continue, with the EU showing a lot more ambition than its main trading partners.

The current approach of the EU to levelling the playing field resulting from asymmetrical efforts on climate change was to use free allocation and compensation for indirect costs. Studies show that this approach may not be practical starting towards the end of 2020s, as under different scenarios the available free allocation may start not meeting the needs. New ways to level the playing field and avoid carbon leakage need to be found, which can be applied (imperfect as they may be) at different levels of ambition. BCA is one approach that has been put forward by the European Commission (EC) under the name of Carbon Border Adjustment Mechanism (CBAM) . While cautious, if not outright skeptical as regards border carbon adjustments (BCAs) in the past, the European Commission, following political direction, has started the discussion on the possible adoption of a CBAM.

In the course of the debate, a number of options have been considered to address the risk of carbon leakage[4]. Among the recurring ones are free allocation/compensation of indirect costs, internationalization of the carbon market through linking and the use of Article 6 Paris Agreement, border carbon adjustments, and a suite of tools to create a market for low carbon products. Other potential options include consumption charges (a charge that shifts the carbon price to consumers based on the weight and type of material in a final product) and contracts for difference (a support mechanism to safeguard the profitability of low-carbon investments based on the amount of avoided carbon and a set carbon price.)

[4]https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-Carbon-Border-Adjustment-Mechanism

1.2 Report objectives and structure of the Project

The project 'Border Carbon Adjustments in the EU: Issues and Options' [5] was started in November 2019 and is an attempt to assess BCAs and their different architecture, components and possibilities. The need to address carbon leakage is driving a broader and more open debate, with border carbon adjustments being one option among many. Therefore, approaches which may be complementary to BCAs should not be disregarded, including the creation of a framework that will lead to a market for low carbon products. Without such a market, the tools available to the EU to implement the European Green Deal will be incomplete.

This report is intended to provide stakeholders with an overview of the issues and options associated with border carbon adjustments in the EU context. The report pursues a number of objectives:

- The report examines in-depth the concept of a BCA. This is done taking into account the EU and global context and analysing the building blocks and design options that could be considered, including considerations of WTO law.
- It also ponders other approaches that have been discussed in the literature and which are part of the on-going dialogue on carbon leakage and competitiveness. These include consumption charges and contracts for difference.
- The report also examines different combinations between the options considered, as well as the functions/needs/issues that individual options or their combination will address.

Additional activities concerning the EU consultative process were conducted in the context of the Inception Impact Assessment and the Public Consultation. As well, ERCST undertook consultations in the capitals of major trade partners and EU Member States in order to disseminate the findings of the report and gather input from stakeholders across the EU, as well as increase understanding on this topic through focused discussions.

Process

The project has used an interactive process alternating between papers produced by the project team and consultations with stakeholders, either through face-to-face meeting or by using electronic platforms. This was largely done by interacting with EU stakeholders, from Brussels as well as throughout the EU.

This was complemented by an intense global consultation with international partners. Virtual Town Halls have been held in cooperation with thinks tanks and academia in the United States,

[5] **The Project website is available at the following link: https://ercst.org/border-carbon-adjustments-in-the-eu**

Republic of Korea, India, and Japan, and in the second round with South Africa, Mexico, Russia and Ukraine.

2. The EU context

To put this report into context, it is necessary to understand the latest developments and discussions unfolding within the EU institutions around the EGD and the BCA. It started with the European Parliamentary elections of May 2019, which saw an increase in the number of green-leaning MEPs in the European Parliament.[6] The political declaration of the incoming EC President van der Leyen in July 2019 provided a signal that the BCA was on the political agenda of the new Commission.

The first milestone for the new EU Commission has been the communication on the EGD issued on December 11th. The objective of climate neutrality was then endorsed by the European Council in its December 2019 conclusions.

The EGD[7], put forward in December 2019 paved the way for the Commission to propose changes to more specific laws, such as the EU ETS Directive, and propose new legislation, for instance on a BCA. As a first pillar, to ensure a climate neutral European Union by 2050 the Climate Law was presented by the Commission on 4th March 2020.

The European executive branch, the European Commission, is currently elaborating the legislative framework for the EGD components on an ambitious timeline. The health crisis is likely to have a significant impact on the implementation of the Commission's work program for 2020 and some elements of the EGD may need to be granted additional time.

Despite this possibility, fiscal instruments have maintained a high position on the agenda, even growing in importance. Impetus for this came from the proposed European Recovery Package and the updated Multiannual Financial Framework, which expects revenues of 5 to 14 billion EUR from the CBAM. A historical in-person four-days-long July European Council[8] confirmed that the CBAM should be agreed earlier than expected, especially considering links of the BCA revenues to the EU budget and the Recovery Fund.

[6] 2019 European Parliament election results: https://www.europarl.europa.eu/election-results-2019/en
[7] Communication on the European Green Deal: https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
[8] https://www.consilium.europa.eu/en/meetings/european-council/2020/07/17-21/

Analytical exercise and assessing impacts

The first step in the process towards adoption of a CBAM consisted in the elaboration of an **I**nception Impact Assessment Roadmap. A consultation was subsequently organized on this roadmap in the spring of 2020. The main objectives of the roadmap are to assess the different policy instruments for the elaboration of a BCA (e.g. a carbon tax on selected products (imports & domestic), a new carbon customs duty or tax on imports or an extension of the EU ETS to imports), its sectoral scope as well as the methodological approach to evaluate the carbon content of, and set carbon pricing for, imported products.

Following the Inception Impact Assessment, more than 200 submissions were submitted both from within and outside the EU. ERCST analysed[9] several key elements based on the perceived objectives of a BCA (environmental, competitive, diplomatic, fiscal), the development of policy options, the use of revenues and the operationalization of the BCA. Submissions to the public consultation highlighted the need for further thinking on the design of the mechanism -- issues that will be subject to further examination during the regular Public Consultations in summer and fall of 2020, as well as the Impact Assessment included with the BCA proposal scheduled for early 2021.

The European Council and the Member States

The European Council confirmed the introduction of a BCA by 2022 with the historical European Council meeting in July 2020. EU Member States in principle have shown general support to the introduction of a BCA, with some emphasizing the need to examine other approaches. Germany and France supported the idea of CBAM supplementing the existing instruments in line with WTO rules in a statement on the Recovery Package[10] on May 18th and during the German Presidency of the EU Council. The two Members states were also joined by Poland in their declaration that the CBAM as a mechanism is a way to protect the EU's competitiveness and is a potential source of funding to the modernization, innovation and just transition mechanisms. Germany, Belgium, Hungary and the Czech Republic also released a statement on June 25th on the need to assess all possibilities and alternatives to design a BCA[11].

[9] ERCST Border Carbon Adjustment Submissions Synthesis to Inception Impact Assessment, 2020

[10] https://www.bundesregierung.de/resource/blob/973812/1753772/414a4b5a1ca91d4f7146eeb2b39ee72b/2020-05-18-deutsch-franzoesischer-erklaerung-eng-data.pdf?download=1.

[11] https://data.consilium.europa.eu/doc/document/CM-2784-2020-INIT/en/pdf

The key EU institutional actors

Within the Commission, this activity is led by DG TAXUD in cooperation with DG CLIMA and DG TRADE. This cooperation represents the nature of the CBAM itself – primarily as a fiscal tool, with consequences for trade and climate policies, and with a very strong international dimension.

In the period leading up to the proposal and operationalization of a BCA, the European External Action Service (EEAS) is already highlighting the importance of communicating the Commission's intentions and possible impacts of the EGD and BCA vis-à-vis trade partners.

The next steps around the BCA follow the following timeline:

- Public consultations carried out on 22 July – 28 October 2020;
- Planned EU outreach activities involving DG TRADE and EU delegations of the European External Action Service (EEAS);
- A European Commission conference taking place in January 2021;
- Publication of the proposal expected around June 2021;
- EU negotiation process (Commission, Council, Parliament);
- Adoption by the end of 2022.

3. Global outreach - Townhalls

Past discussions of BCAs in Europe and elsewhere have usually been, in the past, followed by quick international censure from potentially affected trade partners, underscoring their propensity to incite diplomatic fallout and exacerbate political and legal risks. While the EU has never before tabled a formal legislative roadmap for a European BCA as specific as, and with the degree of political support invested in, the current CBAM, the dramatic controversy and, ultimately, retreat of the EU sparked by its attempt to include international aviation within the scope of the EU ETS illustrate the potential diplomatic risks associated with unilateral climate policy measures that seek to extend carbon constraints to foreign emitters.

Consequently, as part of the project underlying this report, a conscious effort was made to systematically scope views of international stakeholders on the planned European CBAM through a series of virtual Town Halls, organized over the course of spring and summer 2020 with representatives from industry, policy making and civil society from the following countries: India; Japan; Mexico; Republic of Korea; Russian Federation; South Africa; Ukraine; and the United States.

These Town Halls were organized jointly with a local host – usually an academic or research institution – and followed a recurring template, featuring a prepared presentation on the rationale and context of the CBAM debate in the EU, kick-off remarks from one or two representatives of European industry, a moderated panel discussion with local stakeholders as well as, finally, open discussion with the audience.

Overall, these discussions revealed awareness of – and interest in – the European plans to implement a CBAM. Stakeholders abroad could be potentially seen in a number of categories with different attitudes: environmental organizations/think tanks/academia; governments and government affiliated organizations; business.

Some, especially governments and business expressed concern about the potential impacts on trade with the EU. Others displayed attitudes that have visibly evolved since BCAs were first discussed over a decade ago: with the Paris Agreement in place and the stringency of climate policies across all jurisdictions gradually increasing, emissions leakage and competitiveness impacts are now also a growing concern for Europe's trade partners.

Hence, while some stakeholders in the Town Halls remained strictly opposed to a prospective European CBAM (most governments), a significant number of reactions suggested that trade partners may be taking a more nuanced understanding of the motivations behind the measure. Some stakeholders, especially those representing environmental organizations, welcomed the European plans as a signal to other countries to accelerate their climate efforts, and a way to

increase global climate ambition, which is helping their agenda. Business sems to be taking a more wait -and-see attitude until the details of the EC proposal are out.

The discussion in Town Halls tended to focus on more specific questions of technical design and likely implications of a future CBAM. Support was widely expressed for including a mechanism in the CBAM that would allow crediting policies already applied to producers in the country of origin, so as to prevent a double policy burden on foreign producers and strengthen the incentive for trade partners to introduce more stringent climate policies. Several representatives of industry also underscored the importance of a way to demonstrate their actual carbon intensity, in case the EU relies on default values that would effectively penalize best performers abroad.

Another recurring argument related to revenue use, with several stakeholders recommending that revenue not be retained by the EU – for instance to bolster its general budget – but be returned to trade partners or an international fund as a way to reduce diplomatic fallout, reflect equity concerns, and decrease the burden of low-carbon transition for foreign producers.

Several stakeholders pointed to existing bilateral or regional arrangements – such as that entered between countries in special relationships with the EU (such as Association Agreements) – as grounds to merit an exemption or favourable treatment. Not doing so, they argued, would result in particularly harsh impacts as countries (e.g. Ukraine). First, countries in such relationships have intense and deepening trade relationships with the EU, putting them at special risk. And second, those countries have typically committed as part of their agreements to strengthen environmental policies, putting compliance costs on their domestic producers to which the CBAM would add.

Conversely, the possibility of bi- or plurilateral cooperation on the design and implementation of a BCA was raised by some stakeholders, for instance in the event of a change in U.S. administration; still, the likelihood that domestic constituencies would exert pressure to censure the EU and adopt countermeasures was seen to likely temper the prospects of any such cooperation, even if these same constituencies might call on their government to implement a BCA of its own.

Despite the largely constructive discussions, many stakeholders also expressed concern about the impacts of a prospective CBAM on their economies. Some indicated that they did not consider a unilateral BCA imposed by the EU to be in line with the decentralized spirit of the Paris Agreement and the principle of common but differentiated responsibilities and respective capabilities (CBDR&RC). Others criticized that a European CBAM would make it more difficult to implement a just transition in their countries.

As such, the CBAM was thus seen by some stakeholders as a threat to international climate cooperation going forward. Legal risks under international trade law and potential judicial challenge under the dispute settlement mechanism of the WTO were also raised in virtually every Town Hall. Many stakeholders therefore revealed that they were not convinced a CBAM could, or would, actually be implemented. Some encouraged stronger consideration of alternative policy options to address leakage and competitiveness concerns, such as international cooperation at a sectoral level, or linking of domestic carbon pricing systems. Finally, a widely held sentiment related to the importance of a transparent dialogue with trade partners, something many stakeholders felt had not yet occurred to a sufficient degree.

4. Analysis of BCAs

Structure of the analysis

Our analysis is structured as follows: first, we break down BCAs into eight major design elements, each of which offers policy makers several options for implementation. We then proceed to evaluate these options through the lens of five criteria, allowing us to compare alternative implementation choices. In formal terms, this approach comes closest to the method known as Multi-criteria Analysis (MCA), which allows for the qualitative appraisal of options for policy design through the following analytical steps:

- Identifying **objectives**;
- Identifying **options** for achieving the objectives;
- Identifying the **criteria** to be used to compare the options; and
- **Analyzing** the options (DCLG, 2009).

This subsection briefly discusses the objectives pursued by a BCA and additional policy options, describes the main design elements and implementation options of BCAs, and outlines the criteria we subsequently apply in the remainder of this section to each of the BCA design elements and implementation options, as well as, in the next section, to additional policies: consumption charges and carbon contracts for difference (see Section 4).

4.1.1 Objectives

A clear understanding of the objectives pursued by a BCA is important to evaluate the suitability of alternative design options to achieve those objectives, as well as the ability of additional policy options – such as consumption charges and carbon contracts for difference – to complement or even substitute for a BCA. Clarity of objectives is also important for other reasons, such as communicating the aims of the BCA to stakeholders and affected trade partners to foster political acceptance, and lowering legal risks associated with the intent and purpose of the measure (see below, Section 3.2). Determining the objectives of a BCA can occur in different ways: politically, based on how relevant actors such as the European Commission or industry stakeholders describe the problem the BCA should solve, and the aims and expectations set out in policy statements and documents; or conceptually, based on the prescriptions and recommendations set out in the academic literature and other analysis, including legal analysis.

Overall, a BCA is widely seen as a measure that is, first and foremost, intended to address carbon leakage and level the playing field, irrespective of the level of the EU emissions cap. This can occur through multiple channels, including:

- **Limiting emissions leakage** from the relocation of production and investment into jurisdictions with no or less restrictive climate policies;
- **Protecting against reduced competitiveness of domestic industries** relative to foreign competitors, due to asymmetric climate policies and the uneven playing field that follows. This is the other side of the coin vis-à-vis the environmental motivation: the negative socio-economic impacts from the implementation of ambitious climate policies. Reduced competitiveness and loss of market share can, in turn, result in loss of tax revenue, loss of foreign investment, offshoring of employment, destabilization of vulnerable communities, and other social and economic ripple effects.
- **Incentivising foreign trade partners and foreign producers** to adopt measures comparable/equivalent to the EU's; and
- **Yielding revenue** that can be used to fund investments in clean technology innovation and infrastructure modernisation or as international climate finance.

Policy makers need to communicate objectives of a BCA clearly and consistently. In the EU, the language used for the objectives of the planned BCA has seen some evolution over the past year and has led to a certain degree of confusion and debate.

As stated earlier, in her Political Guidelines of July 2019, European Commission President Ursula von der Leyen[12] originally referred to the need "to avoid carbon leakage". Some months later, in the EGD Communication released in December 2019,[13] the language used was as follows: "Should differences in levels of ambition worldwide persist, as the EU increases its climate ambition, the Commission will propose a carbon border adjustment mechanism, for selected sectors, to reduce the risk of carbon leakage." The March 2020 Inception Impact Assessment[14] states that "a carbon border adjustment mechanism would ensure that the price of imports reflect more accurately their carbon content" and picks up some of the language used in the EGD Communication.

This line of argument has been retained more recently. In the EC Communication on the 2030 Climate Target Plan of 17 September 2020,[15] the language used is as follows: "In the absence of comparable increases in ambition by our partners, as the EU increases its climate ambition, the Commission will propose a carbon border adjustment mechanism […] to reduce the risk of carbon leakage as an alternative to measures currently in place". Less formal statements by EU and Member State officials, however, have typically raised the need to stimulate greater climate

[12] https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf
[13] https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
[14] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-Carbon-Border-Adjustment-Mechanism
[15] https://ec.europa.eu/clima/sites/clima/files/eu-climate-action/docs/com_2030_ctp_en.pdf

ambition of trade partners and address "unfair" competition by ensuring a level playing field for EU industry. More recently, the expectations from a BCA have expanded to also include revenue generation as a new source to temporarily lift the EU's own resources ceiling and help fund the Recovery Plan for Europe.[16]

This has led to a debate whether the CBAM is meant as a tool to prevent leakage and level the playing field, or a tool that allows and justifies an increase in the level of the reduction target. Strictly speaking, a BCA needs to be seen as preventing leakage and levelling the playing field. The CBAM will not in itself change the cap – that is a purely political decision – but the CBAM is seen as a necessary condition for such an increase to be considered.

4.1.2 Design elements and options

All possible BCA variations have certain elements in common, and each of these elements offers different options for design and implementation. Accordingly, policy makers have to make choices for each element when they decide to introduce a BCA. At a sufficiently general level, these choices can be broken down into decisions about:

Type of policy instrument: A BCA can take the form of a price-based instrument, which includes taxes and customs duties, or of a quantity-based instrument, notably an extension of an ETS. Each option has different legal and administrative implications (see below, Section 3.3.1).

Scope and coverage: A BCA has to make a determination of its scope and coverage, that is, specify the trade flows affected by it, the geographies and sectors it applies to, and the types of emissions it adjusts for. Specifically, the options include:

- Coverage of trade flows: should the BCA cover imports only, exports only, or both? (See below, Section 3.3.2)
- Geographic scope: should the BCA apply to all foreign countries or specific trade partners only, based e.g. on economic development status or participation in international climate cooperation? (See below, Section 3.3.3)
- Sectoral scope: should the BCA apply upstream to selected energy-intensive and trade-exposed basic materials only, or also downstream to compound semi-manufactured and manufactured goods? Should it apply to electricity or other energy sources? Should it apply to agricultural products? (See below, Section 3.3.4)

[16] https://www.consilium.europa.eu/media/45109/210720-euco-final-conclusions-en.pdf

- Emissions scope: when applied to the emissions embedded in products, should the BCA adjust for direct emissions only (Scope 1), or also for indirect emissions (Scope 2, Scope 3)? (See below, Section 3.3.5)

Determination of embedded carbon: Because BCAs apply to carbon embedded in covered products, they need a method to determine the carbon intensity of products. This can occur individually for each product by measuring or calculating the emissions from the production process or can be based on an assumed default intensity (see below, Section 3.3.6).

Calculation of crediting for policies: Once embedded emissions have been calculated, the level of adjustment needs to be determined. This would be a straightforward application of the EU carbon price (based on, for example, a rolling average of ETS prices over several years), but a fundamental question is whether the EU will credit foreign producers for any climate policies they may have been subject to in the country of export. (see below, Section 3.3.7).

Revenue use: Revenue collected under a BCA can be considerable and can serve different purposes. It may accrue to the general budget, or be earmarked for specific uses, such as support for research and development, compensation for affected industries, or international climate finance (see below, Section 3.3.8).

4.1.3 Evaluation Criteria

In our evaluation of different BCA design options and additional policies, we draw on the objectives described above in Section 3.1.1 to infer the following criteria for a more systematic comparison:

- **Environmental benefit:** this criterion stands for the effectiveness of the BCA in preventing emissions leakage, thereby allowing EU climate policies to result in reduced global GHG emissions. It also considers to what extent a BCA might lead to global environmental benefits by providing incentives for other countries to adopt equivalent measures;
- **Competitiveness benefit:** this criterion represents the ability of the BCA to level the competitive playing field and shield industry against competitive disadvantage. It also considers the impacts of a BCA on those sectors not covered, whether they be downstream producers (impacts on manufacturers) or producers of goods that are in a competitive relationship with covered goods (material neutrality);
- **Legal feasibility:** with this criterion, we gauge the compatibility of the BCA with applicable legal constraints, especially under WTO law and the international climate regime;
- **Technical and administrative feasibility:** this criterion captures the technical viability of the BCA as well as its complexity and cost of implementation, both for the public entities administering the BCA and for private entities affected by it;

- **Political feasibility**: this criterion represents the political appeal of the BCA to domestic constituencies as well as its potential to affect diplomatic and trade relations.

While the assessment of alternative design options and policy choices through a common set of evaluation criteria has the advantage of allowing an apples-to-apples comparison, it bears noting that the criteria we apply offer considerable scope for discretion, entailing a degree of subjectivity. Rather than providing mathematical precision, they serve as a heuristic metric to summarily assess and visualize a diverse range of factors and considerations in the evaluation of highly complex policy options. Our application of these criteria is informed by our understanding of the technical, legal, and political implications of alternative policy choices, as well as long-standing experience with climate policy discussions at the domestic and international level.

4.2 Background on relevant WTO law

The relevant obligations for BCA in trade law (hereinafter, all references are to WTO law) depend fundamentally on whether the BCA accompanies a carbon tax or an ETS. In what follows, the analysis focuses on the ETS scenario, but for reference it also highlights the most important distinctions between that and the carbon tax scenario.

A BCA accompanying an ETS would have to satisfy the obligations in Article III:4 of the General Agreement on Tariffs and Trade (GATT), which governs domestic laws, regulations and requirements affecting products' internal sale, offering for sale, purchase, transportation, distribution or use. The core commitment is national treatment: that the imported product should receive treatment no less favourable than the like domestic product. National Treatment is also relevant for a tax-linked BCA, but it would be primarily covered under GATT Article III:2.

A key question is whether a low-carbon tonne of domestic material would be considered "like" a high-carbon tonne of imported material. Most (but not all) legal scholarship agrees that the two would be considered like products. If they were not, then BCA-based discrimination would be acceptable.

Assuming that they *are* like, the next question then is whether a BCA would treat the high-carbon import less favourably. If the adjustment is set so that the foreign good is charged exactly the same per tonne amount it would have been charged under the ETS, there is no *de jure* discrimination. But there may be *de facto* discrimination, if foreign products are more carbon-intensive, and charges levied on them are therefore higher. There is, however, case law in the

WTO that confirms that *de facto* discrimination does not in and of itself violate Article III.4, if the detrimental impact "is explained by factors or circumstances unrelated to the foreign origin of the product."[17] This argument is something of a legal outlier, so the final answer to this question is uncertain.

GATT Article I (General Most-Favoured-Nation Treatment, or MFN) is also relevant to BCAs. It prohibits discrimination on the basis of the country of origin in any sort of customs duties, charges, or regulatory treatment as described in Article III. This obligation might be breached if the BCA accorded different treatment to goods based on country-level factors, such as exemptions for countries that had ratified the Paris Agreement, default values set according to national GHG-intensities, or different levels of export adjustment based on country of destination.

The Agreement on SCM is also relevant, in particular to the prospect of adjustment (rebate) on exports. If the ETS is considered a regulation rather than a tax—and most agree that it would be—the SCM is fairly straightforward in prohibiting any rebate of the costs of that regulation at the point of export. This is a key difference between an ETS-linked BCA and a carbon tax-linked BCA; the latter would likely be able to legally adjust at the point of export.

If a BCA did fall afoul of obligations under GATT Article I or III, it could still be saved by recourse to GATT's Article XX: General Exceptions. Article XX(g), which most agree would cover measures aimed at mitigating climate change, allows measures to breach other sections of the GATT provided they are "relating to the conservation of exhaustible natural resources." "Relating to" has been defined as implying a reasonable relationship or connection between the measure and the conservation of the resource in question. That is, a BCA would have to be able to demonstrate that it actually does address climate change – that there is a close connection between the means (the BCA) and the end (climate change mitigation). Most agree that a BCA aimed exclusively at preventing leakage would pass this text. It is certain that a BCA aimed at preventing competitiveness impacts would not.

If a BCA passes the text of sub-paragraph XX(g), it still must pass the requirements of Article XX's Chapeau. The chapeau is designed to ensure that the measure is a *bona fide* environmental measure, and not a disguised restriction on international trade, and that it does not constitute arbitrary or unjustifiable discrimination. Whereas the tests of Article I and III are about the *impacts* of the measure, the tests in Article XX's Chapeau are about its *intent*: in the case of

[17] *Dominican Republic-Import and Sale of Cigarettes*, AB Report, para 96. See also *US-Clove Cigarettes*, AB Report, para 182, where a similar argument is made in the context of "less favourable treatment" under the Agreement on Technical Barriers to Trade.

XX(g), is the measure legitimately aimed at conservation of a liveable global atmosphere? Or is it really protectionism?

It is difficult to distil from the case law guidelines for BCA, since every case will have its own unique and determinative context and details, and there are many different possible BCA regime designs. But some general guidance is possible. It may be illegal to:

- Require specific policies as a basis for exemption from BCA, as opposed to requiring that the exporter achieve some given level of climate performance;
- Implement exemptions or calculate adjustment levels based on the country of origin, as opposed to doing so at the level of the individual producers based on their environmental performance;
- Implement BCA before having tried to negotiate in good faith to reach some multilateral solution to the problem of carbon leakage;
- Implement a BCA that fails on the criterion of good governance (i.e., transparency, due process, etc.), if the result effectively makes the regime more arduous for foreign producers; or
- Include any exemptions from coverage of the BCA (e.g., for parties to the UNFCCC's Paris Agreement) not justified by the objective of mitigating climate change by preventing leakage.

It should be noted that the GATT's General Exceptions are available only to save breaches of GATT obligations. Most agree that breaches of other Agreements, such as the SCM, could not be saved by recourse to GATT Article XX.

4.3 Assessing the elements

In the following sections, we proceed to describe the main implementation options for each design element in greater detail, adding a discussion of their relative implications along the five criteria of environmental benefit, competitiveness benefit, legal feasibility, technical and administrative feasibility, and political and diplomatic feasibility.

4.3.1 Policy mechanism

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Carbon Tax	*Neutral (depends on level of carbon price)*	*Neutral*	*Requires unanimous vote in the Council*	*Relatively easier to implement due to absence of trading component*	*Neutral*
Customs Duty	*Neutral (depends on level of carbon price)*	*Neutral*	*Can be adopted with qualified majority vote*	*May be easiest to implement due to ability to build on existing customs infrastructure*	*Neutral*
Extension of the EU ETS	*Neutral (depends on level of carbon price, and to lesser extent on price volatility/ predictability in the market)*	*Neutral*	*Can be adopted with qualified majority vote, but potentially riskier under trade law (esp. re. exports)*	*Relatively more difficult to implement due to integration in/link to EU ETS market*	*Neutral*

In terms of the policy mechanism that it is designed to accompany, a BCA can draw on a wide variety of options. At the most general level, a BCA can accompany a price-based instrument, a quantity-based economic instrument, or a regulatory mandate. So far, however, only BCAs paired with a tax or with the extension of an ETS have been discussed or – in the case of California – actually implemented (Fowlie et al., 2018). In its consultation for a European BCA, for instance, the EU Commission has listed four main options: introducing a new carbon tax on imported and domestic products, introducing a new carbon customs duty or tax on imports, extending the EU ETS to imports, or creating a separate pool of allowances outside the EU ETS from which importers would be required to buy allowances at a price mirroring that of EU allowances (European Commission, 2020). Legislative proposals discussed in the U.S. between

2007 and 2010 envisioned the creation of an "International Reserve Allowance Program" that would have extended the national ETS to selected imports (van Asselt et al., 2010).

In terms of environmental and competitiveness benefits, there is no immediate difference between these various policy mechanisms. Each of them can meet the environmental and economic objectives of a BCA, and while it may make intuitive sense for the BCA to take the same form as the climate policy it adjusts for – e.g. a BCA adjusting for an ETS taking the form of an extension of the ETS – there is no requirement to seek such symmetry. That said, however, the different types of mechanism have widely divergent legal, technical and political implications. Many of these are specific to the implementing jurisdiction. In Europe, for instance, a major benefit of introducing the BCA as a measure related to the EU ETS rather than a fiscal measure is that it would very likely only require a qualified majority vote in the Council under Article 192 of the Treaty on the Functioning of the European Union, whereas a tax would very likely require unanimity unless the Council first unanimously exercises a *passerelle* clause in that provision, a possibility the Commission is currently exploring. A customs duty, one of the options under consideration by the EU, may be adopted with a qualified majority vote, but would potentially affect the tariff schedules adopted by the EU under international, regional and bilateral trade agreements.

At the same time, while a measure related to an ETS may face less stringent voting requirements in EU law, it can increase the risk of legal challenges under international law: it would be treated differently from a tax under WTO rules including the SCM Agreement, and incurs particular risk if applied to exports, as this would be more likely to face challenge as a prohibited subsidy. The type of policy mechanisms can also have substantial implications for revenue use. In Europe, for instance, tax revenue accrues to Member States, whereas customs duty revenue is shared between the EU budget and the Member States, and EU ETS revenue, finally, could flow into the innovation and modernization funds. Already, the role of BCA revenue has featured in the negotiations on the Multiannual Financial Framework (MFF) for the EU budget, potentially contributing to future financing of the EU budget and of the Recovery Plan for Europe.

Finally, if the BCA is introduced through extension of an ETS, an important follow-on question relates to whether the allowances will be taken from the existing allowance supply – with potentially significant impacts on price dynamics in the market – or from a newly created 'virtual' pool of allowances whose price may mirror a rolling average price or the day-ahead closing price of allowances in the actual ETS. Designing this bridge between the BCA and the ETS adds a layer of technical and administrative difficulty that is absent from a pure price-based measure.

4.3.2 Coverage of trade flows

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Imports	*Relatively greatest benefit due to maximum emissions coverage*	*Levels the playing field in the domestic market*	*Strongest case under Article XX GATT*	*Complex to implement due to data gaps and limited jurisdiction*	*Controversial as a unilateral, extraterritorial measure*
Imports & Exports	*Environmental benefit uncertain: export coverage lowers carbon constraint for EU producers, but if they are already more low-carbon than international competitors then promoting exports results in net global benefits*	*Levels the playing field in both domestic & foreign markets*	*Coverage of exports weakens environmental case under Art. XX GATT, plus even greater risk under SCM Agreement*	*Complex to implement for imports due to data gaps and limited jurisdiction*	*Likely most controversial abroad because of extraterritorial nature and greater likelihood that it is perceived as protectionism; but likely more popular domestically*

In terms of trade flow, a BCA can adjust for uneven climate policies when foreign goods are imported, when domestic goods are exported, or a combination of both. In practice, only a BCA on imports or a combined BCA for imports and exports will be considered; a BCA purely on exports is not currently under discussion. In its consultation on the European CBAM, for instance, the Commission primarily raises questions related to its imposition on imports, but also mentions the "possibility to grant a rebate to EU exporters" if it is "necessary to achieve the objective of reducing the risk of carbon leakage" (European Commission, 2020). Past and current BCA proposals in the United States have likewise foreseen application to imports and exports: a proposal by the Climate Leadership Council, a bipartisan coalition of corporate, environmental and opinion leaders, envisions extension of the "domestic carbon price to carbon-intensive imports" and proposes that the U.S. "rebate fees paid on carbon-intensive exports" (Shultz and Halstead, 2020).

Here, the different options have far-reaching implications not only in terms of their legal, technical and political feasibility, but they also determine the environmental and competitiveness benefits offered by the BCA. All else being equal, a BCA that only covers imports expands the scope of the climate policy it adjusts for and should thus have a net environmental benefit. By contrast, a BCA that rebates the costs of carbon pricing when domestic goods are

exported will typically reduce the scope of the climate policy it adjusts for, as it allows some portion of domestic production – that portion destined for export – to evade carbon pricing. What is more, such favourable treatment of exported products could, under certain conditions, create an incentive for domestic producers to increase the carbon intensity of exports. Unlike the BCA on imports, thus, the net environmental effect of a BCA on exports– again, all else being equal – might be negative. But the final effect would depend on the relative GHG-intensity of foreign and EU production. If EU exports were less GHG-intensive than the products that would take their international market share in an "imports only" scenario, then extending the BCA to exports as well would have global environmental benefits. Determining whether that dynamic would hold true would be inherently difficult.

In terms of the competitiveness benefit, however, the assessment is different: covering only imports under a BCA can help level the playing field for domestic producers in the domestic market but will not protect the market share of domestic products sold in foreign markets. By contrast, covering only exports will help domestic products compete in the international market, but not address any competitiveness impacts in the domestic market. If the primary objective of the BCA is to strengthen the competitiveness of domestic industry, then a combination of both options – that is, a BCA that applies both to imports and exports – will clearly be the most effective design. Economic research has confirmed that a BCA on both imports and exports will maximize the ability to address competitiveness impacts and leakage (Branger et al., 2014), although it, at the same time, incurs considerable legal risk. As noted in Section 3.2, exempting or rebating a carbon constraint on exports, if the BCA accompanies a regulation such as an ETS, risks that it will be classified as a prohibited export subsidy under the SCM Agreement (de Cendra, 2006). Because it reduces the coverage of the domestic climate policy it adjusts for, moreover, a BCA on exports may be less successful in invoking the environmental exceptions of GATT Article XX.

Still, the effects may be less straightforward in the long run. If the absence of an adjustment on exports results in loss of market share or even closure of domestic production, and relatively more carbon intensive foreign products increase production to fill the gap, failure to address the leakage and competitiveness impacts of domestic climate policies with regard to exports could nonetheless have an overall negative environmental effect (Evans et al., 2020). Also, as the debate in the EU has shown, any BCA that replaces current measures to address leakage and competitiveness impacts – notably the free allocation of allowances – and does not make any provision for exports is likely to face strong political opposition from domestic stakeholders. Such provision for exports could consist in retaining free allocation for exports or introducing some form of compensation payment, potentially sourced from revenue generated by the BCA. With administrative structures already in place and relevant data on domestic producers readily available, a BCA on exports is likely to be technically and administratively easier to implement than an import BCA. Because it is a purely domestic measure resulting in no direct compliance

obligations for importers, moreover, the export-side of a BCA measure would not in itself necessarily disrupt diplomatic and trade relations.

4.3.3 Geographic scope

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
All Countries	*Greatest coverage of emissions*	*Levels the playing field vis-à-vis all countries*	*Least risky under Article I GATT*	*Relatively more complex due to inclusion of largest number of countries*	*Somewhat controversial because perceived as unfair & protectionist*
Exemption of Least-Developed Countries	*Modest loss of emissions coverage; could change over time*	*Levels the playing field for the most important competitors*	*Risks violating Art. I GATT, but aligns with est. principles & practice (e.g. CBDR)*	*Relatively the least complex due to flat exclusion of large number of countries*	*Least controversial because perceived to be fairer and less protectionist*
Exemption on Environmental Grounds (e.g. Carbon Price, Party to Paris Agreement)	*Loss of emissions coverage may be offset by incentive to strengthen climate policies*	*Levels the playing field vis-à-vis countries with weaker constraints (may only be partial)*	*Risks violation of Art. I GATT, will likely need recourse to Art. XX GATT*	*Relatively most complex due to large number of countries and need to determine/compare environmental effort*	*Most controversial because of differentiation & rating other countries' behaviour*

Another design choice related to coverage is the geographic scope of the BCA: that is, which countries are affected by the BCA? It could apply to all trade partners of the implementing jurisdiction, or exempt certain countries based on specified criteria. An exemption can be made conditional on different attributes of countries, including, but not limited to: their level of economic development; their contribution to global emissions; the intensity of trade with the country applying the BCA; their domestic climate policy ambition; or their engagement in multilateral climate cooperation. Depending on the criterion used to apply it, an exemption can thus be motivated by a desire to avoid undue hardship for low-income countries with limited financial and technical capacities; or it can be the result of a more pragmatic balancing exercise between the environmental and competitiveness benefits offered by the BCA and the

administrative burden it entails; or finally, it may seek to incentivize other countries to adopt more ambitious domestic climate action or join an international cooperative arrangement.

Because they are intrinsically linked to country-specific attributes, all exemptions are legally problematic under the MFN principle contained in GATT Article I (see above, Section 3.2). Exempting certain countries from the coverage of the BCA will thus almost certainly result in a need to justify the measure through one or more of the general exceptions contained in GATT Article XX. If the exemption contributes to the achievement of one of the legitimate objectives contained in GATT Article XX, however, and does not otherwise constitute arbitrary or unjustifiable discrimination between countries where the same conditions prevail, it may improve the prospects of the BCA being found in compliance with WTO law. Accordingly, exempting all producers from countries that have instituted sufficiently ambitious domestic climate policies or have ratified the Paris Agreement, for instance, might be justified under GATT Article XX if it is done in a fair and transparent manner. Still, such criteria would likely be challenged as coercive, counter to the bottom-up spirit of the Paris Agreement, and a violation of the principle of non-intervention recognized under general international law, because it would intentionally or de facto influence the domestic and foreign policy choices of affected countries.

Exempting low-income countries such as the group of Least-Developed Countries (LDCs) officially listed as such by the United Nations Department of Economic and Social Affairs would again be, in principle, a violation of GATT Article I, but would align with established international practice under the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR&RC) in the climate regime and the Special and Differential Treatment (SDT) provisions of the WTO regime. If the criteria for exemption were based solely on development criteria, this violation of Article I might be excused by the WTO's Enabling Clause, which allows preferential treatment for developing countries (Holzer, 2014). In terms of the political and diplomatic implications, moreover, this exemption would likely be perceived positively by other countries: already, much of the criticism levelled against BCAs is based on the perceived injustice of developed countries interfering in the economic development of developing countries, extracting revenue from them under the guise of "green protectionism" (Holmes et al., 2011). Unsurprisingly, therefore, one of the questions raised in the consultation process for the proposed European CBAM asks whether the future measure "should allow for exemptions for least developed countries" (European Commission, 2020).

Still, while political or environmental considerations may favour exempting one or another group of countries, the safest design choice under international trade law is to apply the BCA to all trade partners without exceptions. The aforementioned consultation document of the European Commission lists as one option in its questionnaire that an EU CBAM "[s]hould not allow for any exemptions. All imports should be subject to a carbon border adjustment

mechanism equally no matter where they came from" (European Commission, 2020). Not only will this lessen the risk of a violation of the MFN principle contained in GATT Article I, however, but it also would prevent avoidance strategies of importers such as the practice of trans-shipment: that is, routing products to the jurisdiction imposing the BCA via the territory of an exempted trade partner in order to avoid adjustment (Kortum et al., 2016). As soon as individual countries are exempted, administratively complex rules and procedures might have to be put in place to trace the origin of traded goods and identify and prevent trans-shipment, which would undermine the purpose and rationale of the BCA.

4.3.4 Sectoral scope

Option	***Environmental Benefit***	***Competitive-ness Benefit***	***Legal Feasibility***	***Technical & Administrative Feasibility***	***Political & Diplomatic Feasibility***
Basic Materials only (EITEs)	*Relatively the least beneficial because of reduced emissions coverage*	*Levels the playing field for a limited number of products*	*Art. XX GATT: less complex, but also less environmentally beneficial*	*Least complex because of limited scope and relative availability of data*	*Least controversial due to limited scope (esp. with narrowly traded goods)*
Basic Materials (EITEs) & Electricity	*Relatively greater environmental benefit due to expanded emissions coverage*	*Levels the playing field for a larger number of products*	*Art. XX GATT: more complex, but also greater environmental benefit*	*Relatively more complex due to expanded scope and additional data need*	*Relatively more controversial due to expanded scope (but: electricity narrowly traded)*
Basic Materials, Electricity & More Complex Products	*Relatively greatest benefit due to maximum emissions coverage*	*Levels the playing field for the greatest number of products, including domestic manufacturers that use covered inputs*	*Art. XX GATT: most complex, but also greatest environmental benefit; still: necessity unclear*	*Most complex to implement due to significant data gaps and technical challenges*	*Relatively most controversial due to expansive scope, data & technical challenges and trade intensity of goods*

When designing a BCA, the implementing jurisdiction has to determine which sectors and products should be affected by it. In theory, a BCA could cover all traded products throughout the entire value chain, maximizing its ability to prevent leakage and level the competitive playing field. In practice, however, the administrative cost and technical complexity of covering a majority of traded products – especially in the case of complex manufactured goods – would be disproportionate to the environmental and competitiveness benefits of the BCA. Hence, most proposals to date have focused on products from sectors with high carbon intensity – where the climate policies adjusted for impose a non-trivial cost – and high trade intensity, limiting their ability to pass through that cost to consumers because these can easily substitute domestic with foreign products. Such energy-intensive and trade-exposed (EITE) sectors include cement, steel, and aluminium, where the value of embodied carbon products, as a percentage of value added, tends to be relatively high compared with manufactured products. Also, because these products tend to be basic or raw materials, determining their embedded emissions is much simpler than for more complex products further down the value chain. In short, focusing on products from EITE sectors greatly reduces the administrative and technical burden of a BCA while still delivering significant environmental benefits (Böhringer, Carbone, and Rutherford 2012).

By ensuring that the BCA only covers sectors where inclusion affords clear environmental benefits, a narrow focus on EITEs helps meet the conditions set out in international trade law, and notably in the relevant exceptions of GATT Article XX. Selection of the specific sectors to be covered can build on established criteria and thresholds already in use in several jurisdictions, such as those used in Europe under the EU ETS to include vulnerable EITEs in the carbon leakage list adopted pursuant to Article 10b(5) of the EU ETS Directive. Typically, the inclusion threshold will be defined as a combined metric of carbon intensity, calculated as the emission levels and compliance cost in a sector relative to its value added, and trade intensity, measured as the value of imports and exports in a sector relative to total production plus imports. Such determination should be accompanied by ex-ante studies to identify the extent of leakage risk – not least because there may be political pressure from sectors to be covered (Cosbey et al., 2012) – and possible downstream impacts from introducing a BCA. Such downstream impacts are the main downside of a sectoral scope limited to upstream basic materials from EITE sectors: because downstream producers would not be protected by the BCA, they might be exposed to leakage when the prices of basic materials they rely on as inputs increase due to the BCA. Foreign competitors, who still will have access to cheap inputs not subject to a BCA, would enjoy a competitive advantage in international markets as well as the domestic market of the jurisdiction implementing the BCA.

One product not included in the foregoing category of EITEs is electricity. Because of its grid-bound nature, electricity is less trade-intensive than commodities such as steel or aluminium, for which very liquid global markets have emerged. Traditionally, therefore, the electricity sector has not been considered at significant risk of emissions leakage. In recent years, however, as

cross-border grid interconnections have continued to increase and many jurisdictions with ambitious climate policies have seen the average emissions intensity of their electricity fall, electricity trading across national borders from power systems with a relatively higher grid factor to systems with a lower grid factor have become a growing source of leakage. In Europe, imports of electricity with higher carbon intensity from third countries has become apparent along the Eastern and Southern border of the EU (Eurelectric, 2020). In North America, meanwhile, California has introduced a BCA specifically for electricity to address leakage due to imports of coal-fired electricity from neighbouring states (Fowlie et al., 2018). Other energy sources can also be included in a BCA, notably fuels such as oil or gas, again based on the carbon intensity of their production.

Like other design features of a BCA, sectoral coverage can evolve over time, starting with a limited number of products in a pilot or learning phase and expanding over time as the BCA design and its procedures and methodologies have been able demonstrate their viability and offer proof of concept. To better manage administrative complexity and limit diplomatic fallout during the introductory phase of a BCA – when the measure is still potentially at its most vulnerable politically – implementing jurisdictions can also focus on products with low trade intensity, because that will also limit the number of trade partners affected. Over time, as the operation of the BCA becomes routine and its processes and methodologies have been tested and refined, the sectoral scope of the BCA can be expanded to include more complex or trade-intensive goods. This seems to also be the approach envisioned by the EU, with the Political Guidelines of Commission President von der Leyen stating that the European measure “will start with a number of selected sectors and be gradually extended.” A narrow scope, even initially, risks creating incentives to substitute away from materials covered under the BCA in favour of materials that are not covered. With an enlarging scope, however, comes the aforementioned challenge of identifying the point at which the incremental increase in administrative cost and technical complexity outweighs the environmental and competitiveness benefits of the BCA.

4.3.5 Emissions scope

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Direct (Scope 1) Emissions	*Relatively lowest environmental benefit due to lower emissions coverage*	*Levels the playing field with regard to cost of direct emissions only*	*Art. XX GATT: least complex, but also least environmentally. beneficial*	*Relatively least complex due to limited data needs*	*Relatively least controversial due to most limited scope*
Indirect (Scope 2) Emissions from Energy	*Relatively greater environmental benefit due to expanded emissions coverage*	*Levels the playing field with regard to cost of direct emissions & indirect energy emissions*	*Art. XX GATT: more complex, but also greater environmental benefit*	*Relatively more complex due to additional data needs*	*Relatively more controversial due to expanded scope*
Other Indirect (Scope 3) Emissions	*Relatively greatest environmental benefit due to highest emissions coverage*	*Levels the playing field with regard to cost of all direct & indirect emissions*	*Art. XX GATT: most complex, but also greatest environmental benefit; still: necessity unclear*	*Relatively most complex due to greatest data needs*	*Relatively most controversial due to most expansive scope*

When deciding on the design of a BCA, a decision also needs to be made on the emissions scope it covers. Emissions associated with products are generated in various stages. Direct emissions are those resulting from the production process itself, including process emissions as well as emissions from the combustion of fuels to generate heat and electricity at the site of production (Gisselman et al., 2020). Indirect emissions include those related to the use of electricity, heat or steam generated offsite, as well as other emissions arising during the lifecycle of the product, such as emissions from other inputs such as raw materials, the transport of goods to market, product end use, and the disposal of the product. A common framework to describe these emissions is the Greenhouse Gas Protocol, which distinguishes three emission scopes: Scope 1 (direct emissions); Scope 2 (indirect emissions from purchased electricity, heat and steam); and Scope 3 (all other indirect emissions) (WRI et al., 2004).

A BCA can be designed to cover any combination of direct (Scope 1) and indirect (Scope 2 and 3) emissions, and from the perspective of environmental and competitiveness benefits a larger scope will – all things being equal – result in greater benefits. In order to avoid discrimination between domestic and foreign products, however, the scope of emissions covered by the BCA

should not be greater than that of the domestic climate policy it adjusts for. That is not to say that a climate policy which only covers direct emissions cannot be accompanied by a BCA that covers indirect emissions: if the domestic climate policy covers direct emissions from electricity, for instance, the resulting cost will be at least partly passed through to industrial electricity consumers, meaning that their indirect emissions are subject to a carbon price at the location where they originated. Assuming that the direct emissions of industrial producers are likewise covered by the domestic climate policy, a BCA adjusting for that policy should be able to cover both the direct and indirect emissions associated with imported products.

Adjusting for Scope 3 emissions, such as those related to the transport of the good to market, is less straightforward. While such emissions may be subject to a carbon constraint in the jurisdiction imposing the BCA, the constraint will often be the result of other domestic climate policies than the one being adjusted for. In the EU, for instance, road transport emissions are subject to a variety of climate policies – such as fuel taxes or tailpipe emission standards – that impose a cost on users. The BCA currently being elaborated by the European Commission, however, is intended to adjust for the carbon price revealed under the EU ETS, a policy that only covers direct emissions from industry, aviation and the electricity sector. Hence, to ensure symmetry, the BCA should only cover direct emissions from industry and electricity and can, based on the logic described above, also cover indirect emissions from electricity used as an input in the production of imported goods. Expanding the BCA to indirect emissions from transport, however, would also necessitate a change in the definition of the domestic climate policies the BCA is meant to adjust. What is more, the domestic climate policy on transport will typically only cover emissions from domestic transport, not from international transport. Hence, only a subset of transport-related indirect emissions could be adjusted for, if at all, namely those emissions associated with domestic road transport in the country of origin. For the often more important share of transport-related emissions – those related to the international shipment of goods – there would be no domestic climate policy to adjust for.

Another challenge with Scope 3 emissions is methodological: whereas Scope 1 and even Scope 2 emissions associated with traded goods can still be determined with relative accuracy (see below, Section 3.3.6), the identification of Scope 3 emissions from inputs, transport and end use can pose insurmountable challenges. This applies in particular to products with complex value chains that themselves cross multiple borders. Once again, an expansive scope could lead to a situation where the administrative cost of the BCA would outweigh its environmental and competitiveness benefits. Nevertheless, the European Commission consultation on the proposal for an EU CBAM identifies the option of including Scope 2 and 3 emissions when it lists possible designs that “cover not only direct emissions but also include indirect emissions that occurred in the production of the electricity used to produce the product”, that “cover the emissions of the complete value chain, not only the emissions of the last stage of production before import

into the EU", and that cover emissions "from international transport of the goods covered" (European Commission, 2020).

4.3.6 Determination of embedded emissions: product-based; various benchmarks; hybrid

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Calculation at product level (each shipment)	*Most accurate measurement, so highest environmental benefit*	*Levels the playing field facility by facility - strong*	*Strong case under Art. XX: non-arbitrary*	*Highly complex data needs, esp. if scope 3 covered*	*Relatively controversial - burdensome*
Benchmark: best practice domestic/global	*Relatively weak benchmark, allows most leakage*	*Assumption benefits foreign producers ==> uneven playing field*	*Strong case under Art. XX: less discriminatory*	*Least complex: data mostly available*	*Relatively less controversial - low burden, beneficial assumptions*
Benchmark: worst practice domestic/global	*Relatively strong benchmark, allows least leakage*	*Assumption penalizes foreign producers ==> benefits domestic*	*Weaker case under Art. XX: punitive*	*Least complex: data mostly available*	*Highly controversial - punitive assumptions*
Benchmark: average carbon intensity of EU producers	*Somewhat weak benchmark, allows more leakage*	*Assumption benefits foreign producers that perform worse than EU average ==> uneven playing field*	*Strong case under Art. XX: less discriminatory*	*Least complex: data mostly available*	*Relatively less controversial - low burden, somewhat beneficial assumptions*
Benchmark: best foreign practice	*Relatively weak benchmark, allows more leakage*	*Assumption benefits foreign producers ==> uneven playing field*	*Strong case under Art. XX: less discriminatory*	*Relatively complex due to limited data availability*	*Relatively less controversial - low burden, beneficial assumptions*

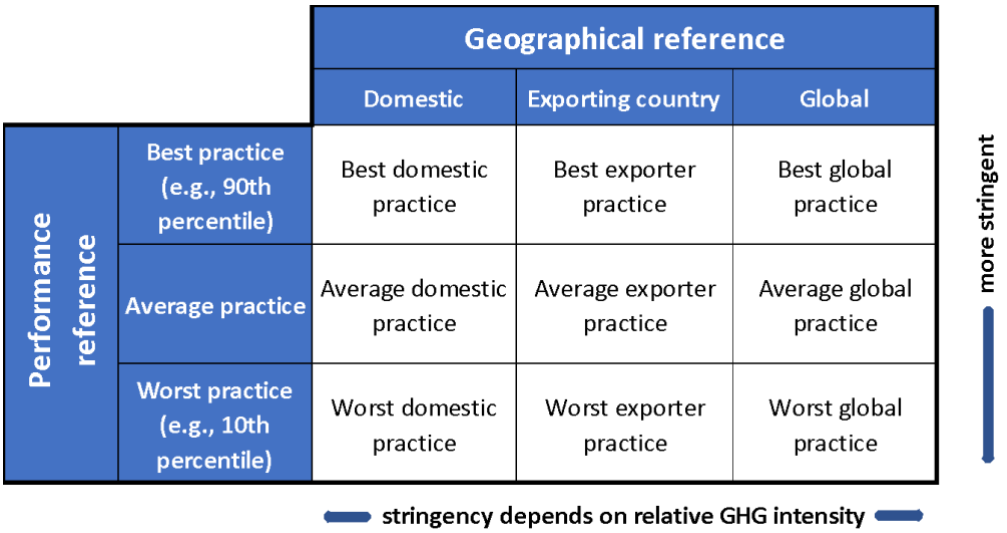
Benchmark: worst foreign practice	*Relatively strong benchmark, allows least leakage*	*Assumption penalizes foreign producers ==> benefits domestic*	*Weaker case under Art. XX: punitive*	*Relatively complex due to limited data availability*	*Most controversial - punitive assumptions*
Hybrid benchmark: scope 2 actual foreign	*Accurate measurement, may allow little leakage*	*Depends on the assumptions for non-scope 2*	*Balance: strong Art. XX case on scope 2; non-scope 2 depends on assumptions*	*Relatively complex due to additional data needs*	*Relatively controversial - depends on non-scope 2 assumptions*

There are two basic means by which an implementing government can choose to calculate/estimate the GHG emissions embedded in a product at the point of import: a product-based approach, and a sectoral-based approach.

A **product-based approach** focuses on the individual products and aims to estimate actual GHG emissions embodied in those products. The only feasible way to do this is to require disclosure by the producer or importer of records, presumably third-party verified. This would have to be done shipment by shipment if anything beyond scope 1 emissions were covered, since the carbon footprints of inputs like electricity can vary seasonally depending on the mix.

From an environmental and competitiveness perspective this approach is effective – it calibrates the charges very specifically to the products' GHG intensity and offers incentives for improvement. For the same reason this approach aligns well with trade law requirements that environmental measures not be arbitrary, and that the objective of the measure be strictly environmental. But it involves a complex administrative endeavour, difficult to police and costly to exporters. The complexity and cost of this approach increase as the scope of emissions covered increases, becoming much more difficult if emissions from intermediate goods are covered. For these same reasons, such an approach is likely to cause friction with trading partners.

A **sector-based approach** uses estimates of GHG-intensity, setting default values based on sectoral characteristics. The table below shows the range of choices available.



As noted in the figure, the level of stringency for each choice is dictated by the relative GHG-intensity of domestic, global and exporter production in the covered sector. For example, if we assume that domestic performance is least GHG-intensive, then the least stringent default would assume best domestic practice.

There are inherent tensions among the various choices, depending on the stringency chosen. The *most* stringent option, assuming worst practice of the most GHG-intensive geographical reference, would be highly effective at preventing leakage and competitiveness impacts. But it would achieve that by erecting a significant trade barrier, and so would be politically contentious, as well as potentially WTO-illegal.

The legal issues would arise because the assumption of poor environmental performance would not be accurate for all foreign producers. One way around this is to offer the opportunity for foreign producers to challenge the assigned default, furnishing evidence that their production is less GHG-intensive. Like any BCA design feature that moves closer to accurate carbon pricing, this has environmental and competitiveness benefits. It would not impose significant administrative hurdles. From a legal and political perspective, the only question about such a scheme is whether the cost and difficulty of certification are undue barriers to trade. This is a particular concern for SMEs that cannot spread the fixed costs over large shipment volumes, and for exporters in less developed countries that tend to lack the necessary infrastructure and institutions for testing and certification (meaning increased costs).

At the other end of the spectrum of choices, the *least* stringent option, assuming best practice in the least GHG-intensive geographical reference, would mirror the strengths and weaknesses of the most stringent. It would be more likely to be politically and legally acceptable. But it would

achieve that by failing to protect against leakage and competitiveness impacts and failing to incentivize cleaner production in foreign producers.

Some have proposed a **hybrid approach** to assigning defaults, blending elements of the product-based and sector-based approaches. Scope 1 (direct) emissions tend to vary little across different producers – the most significant variation derives from scope 2, where the source of power makes a big difference. The default could be set at some global benchmark for direct emissions, combined with a more locally specific figure for scope 2 emissions, whether national, regional, or plant based. This would mean a more accurate carbon accounting than possible under a sector-based approach, with less complexity than a product-based approach. But it would not eliminate the complexity; it still would involve calculating the GHG-intensity of power provided to foreign producers. If national grid intensities were used, such an approach would add the legal problem of breaching MFN obligations, since it would discriminate based on country of origin.

4.3.7 Calculation of crediting for policies: no crediting; price-based calculation; crediting for regulations

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
No consideration of foreign policies	*No leakage, but also no incentive for good foreign environmental practice*	*Offers more than full protection*	*Vulnerable under Art. XX: arbitrary*	*Most feasible option*	*Relatively controversial - seen as unfair*
Consideration of price-based policies	*No leakage, but also limited incentive for good foreign environmental practice*	*Offers slightly more than full protection*	*Strong case under Art. XX: less discriminatory*	*Feasible, but more complex*	*Relatively less controversial*
Consideration of price-based and regulatory policies	*No leakage; full incentive for good foreign environmental practice*	*Offers full protection*	*Strongest case under Art. XX*	*Very complex: hard to equate regulatory policies to prices*	*Potentially least controversial, depending on details of adjustment methodology*

Should a BCA regime grant credits for foreign climate policies, modifying the adjustment to account for those policies in exporting countries?

The administratively simplest option is to not grant such credits. That is, the BCA would be levied on all foreign producers equally, regardless of the climate policies in the country of export. From an environmental perspective that would risk double taxing goods that might already have been subject to carbon pricing, punishing good climate policy in trading partners. This would be good for the competitiveness of domestic producers, but it would achieve that by raising the prices of some competitors' goods in a way that was only poorly connected to environmental objectives. To illustrate, if the exporting country had climate policies exactly as stringent as the importing country, BCA could not be justified as necessary to protect against leakage. As such, lack of crediting might be faulted under the chapeau of GATT Article XX for being arbitrary, and a disguised restriction on international trade.

Not granting credit conforms to the destination principle of taxation, which mandates that goods should be taxed in the country of consumption. This is the principle that guides international practice on VAT, for example, which is usually refunded to producers at point of export and only paid at the point of import in destination markets. However, that regime works well only because almost all countries operate a VAT regime. A first mover in implementing BCA obviously could not count on the costs of climate policies being rebated to foreign producers at the point of export.

If the EU decided that the BCA regime will grant credits, it would face a fundamental choice: whether to credit only for carbon pricing policies (such as carbon taxes and emissions trading systems), or to also grant credit for climate-related regulatory policies more broadly (such as industrial performance standards). The administratively simpler choice would be to credit only for carbon pricing policies. The per-tonne of carbon credit under such a scheme could equal the level of carbon tax or the price of emissions trading units in the country of export. The latter could be based on a multi-period rolling average, to give foreign producers more predictability. Crediting for ETS would be complicated by the likelihood that the two regimes would have different rules on, among other things, sectoral coverage and offsets. Crediting for a tax is more straightforward, though it would have to account for any tax exemptions (for example, to EITE industries) or differential tax rates for different sectors. From an environmental perspective—and therefore a trade law perspective—crediting for carbon pricing would be desirable because it would help the BCA better achieve the objective of levelling the playing field to prevent leakage.

Credit for broader climate policies is a more difficult prospect. For one thing, it is not easy to calculate the per-tonne cost impact of regulations like, for example, coal phase-outs or

maximum carbon intensity standards, and further to infer cost impacts for specific sectors. For another thing, it would be challenging to decide which regulations to cover. Should non-climate policies such as air quality regulations be included? They certainly have climate benefits, and cost impacts for producers. Keeping abreast of all such regulatory policies across a number of trading partner countries, and calculating their cost impacts, would be administratively challenging.

But more fundamentally, it's not clear that such policies *should* be credited. BCA as considered in this document is an accompaniment to a carbon pricing regime and is intended to address the risk of leakage imposed by the costs of such a regime. As such there is an argument for crediting carbon pricing schemes in other countries. But there is no corresponding argument for crediting non-price-related policies in those countries, since the BCA doesn't adjust for domestic policies of that type at the point of import. If a BCA scheme were to credit non-pricing schemes in foreign countries, then for consistency it should also adjust for non-pricing schemes in the implementing country, charging imports at the border for the costs imposed by such schemes on domestic producers.

When calculating the BCA, the implementing jurisdiction not only has the option to credit policy efforts in foreign countries, but also to account for any exemptions, rebates or other forms of favourable treatment benefitting domestic producers. Not doing so exposes the BCA to greater risk of being considered arbitrary and an unjustified discrimination between domestic and foreign producers. A case in point is free allocation of allowances: to the extent that domestic producers under an ETS receive allowances free of charge to cover a share of their compliance needs, any BCA imposed to adjust for the costs of the ETS should only adjust for that share of emissions for which domestic producers have to purchase allowances. Since the share of free allocation relative to compliance needs may differ from producer to producer – as is the case in the EU, where free allocation is based on best practice product benchmarks – calculation of the adjustment could be based on the average share of free allocation across all producers in a sector. As the share of free allocation changed over time, the BCA could be adjusted accordingly.

A general concern with crediting schemes is that they create a risk of trans-shipment. That is, producers based in countries without stringent climate policies have incentives to route their finished goods to flow through policy-stringent countries, seeking to take advantage of the crediting scheme for which they're eligible. This is not an insurmountable challenge; a similar problem plagues country that have agreed to accord each other tariff preferences, and is addressed by rules of origin regulations, and enforcement regimes.

4.3.8 Use of revenue: general revenue; domestic targets, international targets

Option	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Refund to covered domestic firms	*No leakage impacts; may enable environmental improvements*	*Offers more than full protection; domestic subsidy*	*Likely illegal under SCM Agreement; weakens case under Art. XX*	*Complex but feasible*	*Relatively controversial - seen as unfair*
Refund to covered foreign firms	*No leakage impacts; may enable foreign environmental improvements*	*Offers more than full protection; foreign subsidy*	*Strong case under Art. XX*	*Very complex, but feasible*	*Controversial domestically*
Put into general revenue	*No leakage impacts; no environmental impacts*	*Neutral impacts*	*Neutral legal implications*	*Straightforward, feasible option*	*Not particularly controversial*
Domestic fund for climate innovation	*no leakage impacts; likely to create environmental improvement*	*May increase domestic competitiveness*	*May weaken case under Art. XX*	*Complex but feasible*	*Not particularly controversial*
Domestic fund for competitiveness	*No leakage impacts; may enable environmental improvement*	*Likely to increase domestic competitiveness*	*Likely weakens case under Art. XX*	*Complex, but feasible*	*Would be seen as controversial by trading partners*
International fund for climate	*No leakage impacts; likely to have positive climate impacts*	*Neutral impacts*	*Strengthens case under Art. XX*	*Straightforward, feasible option*	*Would be seen positively by international partners*

The design of a BCA regime must include decisions about what to do with the (potentially considerable) revenues raised. The EU Recovery Plan foresees that a carbon border adjustment mechanism could bring additional revenues ranging from about EUR 5 billion to EUR 14 billion.[18]

The most fundamental choice is whether to retain the revenues domestically or send them abroad.

Sending revenues abroad would be a way to address the fact that, at least in the short term, BCA would have a significant economic impact in developing countries that depend on markets in which it is introduced. Revenues could, for example, be devoted to funds that help developing country producers decarbonize production, or that support the costs of any required emissions auditing and certification. This would help ensure that the BCA respected the UNFCCC principle of common but differentiated responsibility and respective capabilities (CBDR-RC).

Another way to respect that principle could be to contribute to international climate funds that benefit developing countries, such as the Adaptation Fund, the Special Climate Change Fund administered by the Global Environment Facility, or the Green Climate Fund. Any such contributions would have to be accounted for as additional to existing climate finance.

Both such possibilities are desirable from an environmental perspective, as they further a low-carbon transition. The first would be more directly effective in preventing leakage. While this option would have detrimental competitiveness impacts on domestic industry, they would be more in the character of levelling the playing field for foreign producers than tilting it away from domestic ones. Both options would help support the argument that the BCA is a bona fide environmental measure, should it be forced to resort to a GATT Article XX defence.

Retaining revenues for domestic use could help further the general objective of addressing climate change in any number of ways, for example by financing low-carbon infrastructure. Or revenues might be targeted specifically at supporting the objectives of the BCA, for example by supporting export-oriented firms, should the BCA not cover exports. Or they might simply be counted as general revenue.

These questions are complicated in the EU context by the fact that the Member States have exclusive competence over fiscal measures. That is, they would need to agree on any general earmarking of revenues to a purpose such as international climate finance. On the other hand, since the revenues are collected at the point of entry to the common market, there could be an argument that revenue from the CBAM should accrue to the budget of the EU.

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18 https://ec.europa.eu/info/sites/info/files/about_the_european_commission/eu_budget/1_en_act_part1_v9.pdf

Any option that retained revenues within the implementing jurisdiction might fare worse in a GATT Article XX defence than the international options. But those that are targeted to support covered firms might be particularly suspect, offering evidence that the BCA regime is more about protecting competitiveness than it is about protecting the environment. From a political perspective, retaining the revenues would be far more popular domestically, and far less popular internationally.

4.4 Scenario analysis

In practice, BCA elements are never designed or implemented in isolation of each other, and options chosen for one element can have significant implications for the evaluation of other elements. Only when all design choices have been decided and the design of the overall BCA becomes apparent can such interactions and trade-offs be identified and fully understood. Needless to say, given the number of design elements for which a choice has to be made and the number of options available to operationalize each element, the potential combinations exceed what can be discussed in one report. For purposes of illustration, we have therefore chosen to focus here on three scenarios that represent a plausible combination of design choices, one based on what currently appears most probable given the policy documents and statements issued so far, and the other two based on an overarching objective which the options in question are best suited to achieve.

By focusing on the probability or centre of gravity of these scenarios, we are able to contrast combinations and highlight trade-offs that are inevitably incurred when focusing on one or another objective. The following subsections provide a brief description of the three scenarios, which we have given a distinguishable name, contain a table summarizing the key design aspects, and include a discussion of potential issues raised by the respective design.

4.4.1 Play it safe

Description of the scenario with all design elements

Design Element	*Option*	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Trade Flow Coverage	*Imports Only*	*Strong benefit due to maximum emissions coverage*	*Levels the playing field in the domestic market only*	*Strong case under Article XX GATT*	*Intermediate complexity due to data gaps and limited jurisdiction*	*Somewhat controversial as a unilateral, extra-territorial measure*
Policy Mechanism	*Extension of the EU ETS*	*Neutral (depends on level of carbon price and price volatility/predicta-bility in market)*	*Neutral*	*Can be adopted with qualified majority vote, but slightly riskier under trade law*	*Relatively high complexity due to need to integrate in/link to EU ETS market*	*Likely neutral (relative to other options, such as carbon tax)*
Effect on Free Allocation	*Free Allocation Rescinded Immediately*	*Most beneficial because price signal strongest*	*Least beneficial: risk that playing field not levelled inside/outside EU, depending on BCA*	*Strongest case under SCM Agreement and Article XX GATT, but may result in com-pensation claims*	*May be easiest to implement if need for EITE benchmark definition falls away*	*Relatively least controversial due to perceived fairness*
Geographic Scope	*Exemption of Least Develop-ed Countries*	*While exclusion of LDCs reduces emissions coverage, initial focus on EU neighbours renders this de facto moot*	*Levels the playing field for goods from the most relevant countries (advanced developing countries)*	*Risks violating Art. I GATT, but aligns with established principles & practice (e.g. CBDR)*	*Relatively the least complex due to flat exclusion of large number of countries*	*LDC exemption least controversial option because perceived to be fairer and less protectionist*
Sectoral Scope	*Basic Materials only (EITEs)*	*Relatively the least beneficial because of reduced emissions coverage*	*Levels the playing field for a limited number of products*	*Art. XX GATT: less complex, but also less environmentally beneficial*	*Least complex because of limited scope and relative availability of data*	*Least controversial due to limited scope (esp. with narrowly traded goods)*
Emissions Scope	*Direct (Scope 1) Emissions*	*Relatively lowest environmental benefit due to lower emissions coverage*	*Levels the playing field with regard to cost of direct emissions only*	*Art. XX GATT: least complex, but also least environmentally beneficial*	*Relatively least complex due to limited data needs*	*Relatively least controversial due to most limited scope*
Determination of Embedded Emissions	*Benchmark: Best Practice*	*Relatively weak benchmark, allows most leakage*	*Assumption benefits foreign producers --> uneven playing field*	*Strong case under Art. XX: less discriminatory*	*Least complex: data is mostly available*	*Relatively least controversial - low burden, beneficial assumptions*

Crediting for policies	*Consideration of price-based policies*	*No leakage, but also limited incentive for good foreign environmental practice*	*Offers slightly more than full protection*	*Strong case under Art. XX: less discriminatory*	*Feasible, but more complex than no consideration of foreign policies at all*	*Moderately controversial, because some climate policies will not be considered*
Use of Revenue	*International Climate Fund*	*No leakage impacts; likely to have positive climate impacts*	*Neutral impacts*	*Strengthens case under Art. XX*	*Straightforward, feasible option*	*Would be seen positively by international partners*

In this scenario, the BCA design focuses on minimizing legal and political risk, as well as technical and administrative complexity. As such, this scenario helps identify the features that enable a BCA to draw the least amount of political opposition within the EU and between the EU and its trade partners, be relatively safe from challenges under the WTO and other relevant international regimes, and generally take the path of least resistance in terms of diplomatic implications as well as domestic administrative efficacy and logistical feasibility.

This BCA would be implemented by way of an amendment to the EU ETS so to avoid a potential need for unanimous voting in the Council. Due to the risk of a BCA on exports being considered a forbidden subsidy, this design would only cover imports, and would only apply to basic products to minimize the chance of legal issues arising from complex emissions estimates. Only products with limited trade intensity, such as cement, would be included, further reducing the likelihood of diplomatic pushback and ensuring greater ease of implementation. In terms of geographic coverage, this scenario exempts LDCs to counteract claims of green protectionism and accusations of injustice. To further limit diplomatic controversy, all revenue collected through the BCA is returned to foreign countries or producers or used to specifically benefit e.g. LDCs in the form of climate finance to create a supportive coalition.

Some features, such as the reliance on a best practice benchmark, where embedded carbon is determined on the basis of a generous assumption that foreign producers are as efficient as a best practice benchmark, reduce the likelihood of discrimination under WTO law. Other features help improve the prospects of successful justification of the BCA under GATT Article XX; for instance, allocation of revenue to an international climate fund, while likely unpopular domestically, can be seen as a plausible choice to limit international diplomatic fallout and further strengthen the environmental credentials of the measure under GATT Article XX. In line with GATT and WTO case law on GATT Article III and the "chapeau" of Article XX, foreign producers are afforded an opportunity to individually prove their carbon intensity.

Overall, thus, the limited geographic, sectoral and emissions scope as well as use of a generous carbon intensity default assumption reduce the complexity and risk of this BCA, but also

compromise its environmental and competitiveness benefits. If revenue feeds into an international climate fund, it can strengthen the legal case of the BCA under GATT Article XX, but it has to do so in a way that is additional to existing climate finance pledges. Finally, by phasing out free allocation immediately, the measure can avoid the perception that it favours EU producers, strengthening the case under WTO law, but that admittedly comes at a risk of incurring domestic political pushback and possible litigation.

4.4.2 Go-getter

Description of the scenario with all design elements

Design Element	*Option*	*Environmental Benefit*	*Competitive-ness Benefit*	*Legal Feasibility*	*Technical & Administrative Feasibility*	*Political & Diplomatic Feasibility*
Trade Flow Coverage	*Imports & Exports*	*Environmental benefit between the two cases above*	*Levels the playing field in both domestic & foreign markets*	*Weaker case under Art. XX and greatest risk under SCM Agreement*	*More complex to implement for imports due to data gaps and limited jurisdiction*	*Most controversial because of extraterritoriality and perceived protectionism*
Policy Mechanism	*Extension of the EU ETS*	*Neutral (depends on level of carbon price and price volatility/predicta-bility in market)*	*Neutral*	*Can be adopted with qualified majority vote, but potentially risky under trade law (esp. re. exports)*	*High complexity due to need to integrate in/link to EU ETS market*	*Neutral*
Effect on Free Allocation	*Gradual Phase-out of Free Allocation*	*Moderately beneficial because price signal strengthened*	*Moderately beneficial: playing field inside/outside EU levelled during transition period*	*Moderate risk of violating SCM Agreement; relatively strong case under Art. XX GATT*	*Relatively most difficult to imple-ment due to added need to decide on transition process*	*Moderately controversial due to perceived fairness (no 'double protection' of EU producers)*
Geographic Scope	*Exemption on Environmental Grounds (e.g. Carbon Price, Party to Paris Agreement)*	*Loss of emissions coverage likely offset by stronger incentive to strengthen climate policies*	*Levels the playing field vis-à-vis countries with weaker constraints (may only be partial)*	*Risks violation of Art. I GATT, will likely need recourse to Art. XX GATT*	*Relatively most complex due to large no. of countries and need to compare environ-mental effort*	*Most controversial because of differen-tiation & rating other countries' behavior*
Sectoral Scope	*Basic Materials, Electricity & More Complex Products*	*Relatively greatest benefit due to maximum emissions coverage*	*Levels the playing field for greatest no. of products, incl. domestic manufacturers that use covered inputs*	*Art. XX GATT: most complex, but also greatest environmental benefit; necessity unclear*	*Most complex to implement due to significant data gaps and technical challenges*	*Relatively most controversial due to expansive scope, data & technical challenges & trade intensity of goods*

Emissions Scope	*Scope 1, 2 and 3 Emissions*	*Relatively greatest environmental benefit due to highest emissions coverage*	*Levels the playing field with regard to cost of all direct & indirect emissions*	*Art. XX GATT: most complex, but also greatest envt'l benefit; necessity unclear*	*Relatively most complex due to greatest data needs*	*Relatively most controversial due to most expansive scope*
Determination of Embedded Emissions	*Calculation at Product Level (each Shipment)*	*Most accurate measurement, so highest environmental benefit*	*Levels the playing field facility by facility - strong*	*Strong case under Art. XX: non-arbitrary*	*Highly complex data needs, esp. if scope 3 covered*	*Relatively controversial - burdensome*
Crediting for policies	*Consideration of Price-based and Regulatory policies*	*No leakage; full incentive for good foreign environmental practice*	*Offers full protection*	*Strongest case under Art. XX*	*Very complex: hard to equate regulatory policies to prices*	*Potentially least controversial, depending on details of adjustment methodology*
Use of Revenue	*Domestic Fund for Climate Innovation*	*No leakage impacts; likely to create environmental improvement*	*May increase domestic competitiveness*	*May weaken case under Art. XX*	*Complex but feasible*	*Not particularly controversial*

This scenario prioritises reducing emissions leakage. Accordingly, it simultaneously seeks to reduce overall emissions while also shielding domestic industries by "levelling the playing field." In terms of its design, this BCA aims for as broad a scope as logistically and administratively possible, including basic materials as well as electricity and more complex and manufactured goods. Its emissions scope is broad, covering direct and both Scope 2 and 3 indirect emissions, and it covers all countries excepting those that meet specified environment-related criteria, such as a certain threshold in terms of their domestic carbon price or the ambition of their NDC.

In order to prevent leakage resulting from loss of market share in foreign markets, this BCA also covers exports. Although covering exports limits the reach of the EU carbon price and risks creating a perverse incentive to increase carbon-intensive exports, this BCA includes exports to prevent loss of market share in international markets and a resulting potential emission increase if more carbon-intensive foreign producers fill the gap. In order to minimize the risk of leakage, this scenario also sees free allocation only gradually phased out as the BCA is rolled out over time. Revenue is likewise allocated to domestic producers to support innovation and minimize disruption in the transition to a low-carbon economy.

An aggressive BCA also in terms of its methodology, it aims for the greatest possible accuracy when determining the embedded carbon of imported goods and the climate policy differential between the EU and third countries. Embedded carbon would have to be reported at product level for each individual shipment, and the adjustment applied to imports would credit all climate policies – both explicit carbon pricing and other regulatory policies – imposed in the

country of origin. Doing so helps retain an incentive for stronger climate efforts by foreign countries and foreign producers.

In terms of its compatibility with international trade law, this design risks being considered discriminatory and would therefore likely rely on being "saved" by Article XX of the GATT, since the centre of gravity of the BCA would squarely rest on avoiding leakage. This BCA design is likely to be sold to domestic political audiences as a "jobs and industry" measure, which also exposes it to greater risk of violating GATT Article III of the GATT and the conditions of Article XX. Aside from the increased legal risk under international trade law, the implications under general international law, international climate change law as well as diplomatic relations more generally are likely to be complex and contentious. As noted in Section 3.2, however, violations of the SCM Agreement cannot be saved by Article XX, and this scenario risks breaching those obligations in two ways: first, by adjusting on exports, and second, by retaining free allocation at the same time as implementing a BCA.

Overall, this scenario envisions a BCA that goes all out to maximize environmental benefits and protect EU industry, but at the expense of being highly complex, risky and controversial. Its design maximizes the scope and granularity of the BCA to achieve its goals. By calculating emissions on a product-by-product basis, exempting countries with comparable climate efforts, and crediting policies in the country of origin, this BCA sends a strong signal to other jurisdictions to incentivize stronger climate action and progress towards a converging playing field. Free allocation is only phased out gradually to balance environmental and competitiveness benefits, and revenue remains with the most vulnerable domestic sectors to strengthen their competitiveness while also achieving environmental benefits. Only the exceptions of GATT Article XX could enable such a BCA design to be WTO-compatible, and it is unclear whether its aggressive environmental objectives would sufficiently dominate any industrial policy motivations to benefit from the exceptions in Article XX. Moreover, it is likely that breaches of the SCM Agreement would be found, with no recourse to GATT Article XX as a defence.

4.4.3 Most probable

Description of the scenario with all design elements

Design Element	Option	Environmental Benefit	Competitive-ness Benefit	Legal Feasibility	Technical & Administrative Feasibility	Political & Diplomatic Feasibility
Trade Flow Coverage	Imports Only	Strong benefit due to maximum emissions coverage	Levels the playing field in the domestic market only	Strong case under Article XX GATT	Intermediate complexity due to data gaps and limited jurisdiction	Somewhat controversial as a unilateral, extra-territorial measure
Policy Mechanism	Extension of the EU ETS	Neutral (depends on level of carbon price and price volatility/predictability in market)	Neutral	Can be adopted with qualified majority vote, but potentially risky under trade law	High complexity due to need to integrate in/link to EU ETS market	Likely neutral (relative to other options, such as carbon tax)
Effect on Free Allocation	Gradual Phase-out of Free Allocation	Moderately beneficial because price signal strengthened	Moderately beneficial: playing field inside/outside EU levelled during transition period	Moderate risk of violating SCM Agreement; relatively strong case under Art. XX GATT	Relatively most difficult to implement due to added need to decide on transition process	Moderately controversial due to perceived fairness (no 'double protection' of EU producers)
Geographic Scope	Exemption of Least Developed Countries	While exclusion of LDCs reduces emissions coverage, initial focus on EU neighbours renders this de facto moot	Levels the playing field for goods from the most relevant countries (advanced developing countries with weaker constraints)	Risks violation of Art. I GATT, will likely need recourse to Art. XX GATT	Intermediate complexity due to need to define and apply environ-mental criteria for exemption	LDC exemption not very controversial because perceived to be fairer and less protectionist
Sectoral Scope	Basic Materials (EITEs) & Electricity	Intermediate environmental benefit due to expanded emissions coverage	Levels the playing field for an intermediate number of products	Art. XX GATT: more complex, but also greater environmental benefit	Intermediate complexity due to expanded scope and additional data needs	Moderately controversial due to expanded scope (but: electricity narrowly traded)
Emissions Scope	Scope 1 and Scope 2 Emissions	Intermediate environmental benefit due to expanded emissions coverage	Levels the playing field with regard to cost of direct emissions & indirect energy emissions	Art. XX GATT: more complex, but also greater environmental benefit	Intermediate complexity due to additional data needs	Moderately controversial due to expanded scope
Determination of Embedded Emissions	Benchmark: Average Carbon Intensity of EU Producers	Somewhat weak benchmark, allows more leakage	Assumption benefits foreign producers that perform worse than EU average ==> uneven playing field	Strong case under Art. XX: less discriminatory	Low complexity: data mostly available	Moderately controversial - low burden, somewhat beneficial assumptions

Crediting for policies	*Consideration of price-based policies*	*No leakage, but also limited incentive for good foreign environmental practice*	*Offers slightly more than full protection*	*Strong case under Art. XX: less discriminatory*	*Feasible, but somewhat complex*	*Moderately controversial*
Use of Revenue	*EU Budget*	*No leakage impacts; may create environmental improvement*	*May increase domestic competitiveness*	*May weaken case under Art. XX*	*Complex but feasible*	*Moderately controversial*

Finally, the third scenario is based on current information as provided by the European Commission in Communications, the Inception Impact Assessment, and verbal statements by officials as well as stakeholder submissions and – where such indicators are absent – on an attempt to balance environmental and competitiveness benefits with technical feasibility and legal and political risks. It describes a BCA that builds on the existing structures of the EU ETS, and reflects these in the choices on sectoral and emissions scope.

Accordingly, it covers energy-intensive and trade-exposed basic materials as well as electricity and includes Scope 1 and Scope 2 emissions in its calculation. In terms of trade flows, it only applies to imports. For the determination of emissions embedded in such imports, it relies on the average carbon intensity of EU producers, an approach already envisioned by a Non-Paper circulated by the French government in 2016.

It only credits price-based policies in the country of export when calculating the compliance obligation for importers. This scenario envisions that obligation to take the form of a purchase obligation of allowances from a separate pool, or a payment equivalent to the day-ahead or rolling average price of EUAs. In this scenario, revenue from the CBAM is channeled into the European recovery plan and may, in future, serve as a potential source of the EU budget.

Overall, this is a relatively balanced scenario that avoids excessive complexity and legal risk while still achieving meaningful benefits. One clear trade-off that limited complexity and risk entails, however, is limited emissions coverage. An upside of this limited coverage is that, by initially focusing on few sectors with low trade intensity and limited methodological challenges, such as cement and electricity, this scenario allows the EU to experiment and learn while only negotiating with a small set of trade partners mostly along the EU external border and relatively few affected companies. A downside of limited coverage is that sectors outside the BCA may see substitution away from their products toward products in covered sectors (cement in some cases can substitute for steel, for example). Another downside is the potentially significant impacts on export-oriented covered firms, given that only imports will be covered.

The use of default values substitutes for producer data, but producers are given an opportunity to prove their actual carbon intensity for an individual adjustment. This mechanism, which already featured in past policy proposals such as the French Non-Paper of 2016, reduces administrative complexity while offering a process that ensures equal treatment of clean foreign and domestic producers in line with WTO case law. On other features, however, such as the geographic scope and crediting of foreign policies, information released to date only allows for speculation. We think that exemption of LDCs would be consistent with past EU policy in the areas of climate change and development and expect that the EU will credit at least some policy efforts, with explicit carbon pricing in the country of origin being the most probable.

4.4.4 Discussion

Comparing alternative scenarios side by side is useful to highlight trade-offs between different BCA designs. A pattern already identified in the previous section (see above, Section 3.3.9) is also evident here, namely that any design capable of maximizing environmental or competitiveness will, all else being equal, also increase the technical and administrative complexity as well as the legal and political risks such a BCA will likely face.

Consequently, the ability to meet the criteria for justification under the environmental exception clauses of GATT Article XX becomes of particular importance, with implications for messaging, process and application. By contrast, a very safe BCA design will generally have a narrow scope in terms of covered products and emissions, relying on assumptions that minimize administrative and compliance cost and that are favourable to foreign producers while offering them flexibility, but weakening the ability of the BCA to prevent leakage and safeguard the competitiveness of domestic producers.

Preventing leakage encompasses both environmental and competitiveness dimensions. However, the scenarios show that maximizing the ability of a BCA to shield domestic industry does not, in every case, improve its environmental performance, especially when it comes to coverage of exports, the role of continued free allocation and the use of revenue. Even where political consensus about the centre of gravity of the BCA design can be reached in the implementing jurisdiction, several trade-offs will have to be navigated. While for WTO purposes it is clear that the environmental aspects need to be strongly emphasized, it is also clear that it is competitive concerns that have brought the discussion about a CBAM to the forefront of the political discourse in the context of the EGD.

In the end, this scenario-building exercise underscores the complexity of BCAs as a policy instrument, with a number of design variables that can be variously combined to address the priorities of different constituencies and technical, legal and political concerns.

5. Consideration of other approaches

5.1 Consumption charges

5.1.1 Description

	Option	Environmental Benefit	Competitive-ness Benefit	Legal Feasibility	Technical & Administrative Feasibility	Political & Diplomatic Feasibility
Consumption charges	*Package of ETS/free allocation and consumption charges * Uses EU ETS product benchmarks to calculate assumed carbon content in materials (as proposed by Neuhoff et al, 2016)*	*Protects against leakage due to consumption charges (but not due to ETS carbon pricing if there is an ETS) *Internalizes carbon costs throughout the value chain *Double taxes, if imports already subject to carbon tax in home jurisdiction *Assuming EU product benchmark performance means low carbon price, no incentives to improve.*	*Relies on free allocation to protect against competitiveness impacts of ETS in home market. *Unlike narrowly scoped BCA, covers downstream producers *Acquittal of tax liability for exports alleviates impacts of the charge in foreign markets*	*Very likely WTO-compliant, since it is a non-discriminatory tax *Accompanying free allocation may be an issue, especially if covered material sectors are accorded higher allocations*	*Narrow scope makes regime more manageable *Difficult for importers to declare amount of embodied materials – data may not exist *Very challenging for EU to determine, maintain, default values for embodied materials in a range of imports*	Less controversial than BCA, since it is structured as an internal tax, and since EU product benchmark is a favourable assumption *requires keeping high levels of free allocation to covered materials sectors*
	Extension of the EU ETS	*Neutral (depends on level of carbon price and price volatility/predictability in market)*	*Relies on free allocation to protect against competitiveness impacts of ETS in home market. *Unlike narrowly scoped BCA, covers downstream producers *Acquittal of tax liability for exports alleviates impacts of the charge in foreign markets*	*Likely violates WTO provisions on non-discrimination *Accompanying free allocation may be an issue, especially if covered material sectors are accorded higher allocations*	*Narrow scope makes regime more manageable *Difficult for importers to declare amount of embodied materials, and very challenging for them to declare carbon intensity of those materials. *Very challenging for EU to determine, maintain, default values for embodied materials in a range of imports*	*Probably received no differently than a BCA by trading partners – difficulty of providing actual data, and punitive assumed defaults, makes this controversial. *Requires keeping high levels of free allocation to covered materials sectors.*

Consumption charges are a means to ensure that the cost of carbon is internalized along the entire supply chain of key basic materials and that it can reach the consumer. The proposal that seemed to have first emerged from Climate Strategies postulated that, they would be levied on a handful of carbon-intensive materials, such as cement, iron and steel. The charge would correspond to the amount of carbon emitted in producing each material, with the value of that carbon equal to the value of carbon allowances in the ETS.

Rather than trying to establish the actual carbon emitted in the production of each producer's materials, the Climate Strategies' (2016) proposal assigned a default value for carbon-intensity of covered materials, equal to the EU ETS product specific benchmark[19]. The price for carbon would be calculated annually, based on historical prices.

The liability for the charge would be incurred at point of production or, for imports, at point of import. That liability could be discharged anywhere from there downstream to the point of sale to final users. A system of records would track that liability in goods with a significant content of covered materials. The liabilities associated with covered materials would be removed at the point of export, for goods not consumed in the implementing jurisdiction.

Imports would have to declare the weight of covered materials they contain, presumably supported by verified records, or be assessed using a roster of default values for material content in various goods.

This instrument is meant to be an accompaniment to an ETS but could in theory be put in place on its own. In the case where it accompanies an ETS, producers of covered materials would still be obliged to surrender ETS allowances but would also be given free allowances at the benchmark level to protect against the ETS' leakage and competitiveness impacts. As the covered sectors progressively decarbonized, the benchmark would have to be maintained at the level applicable for conventional GHG-intensive production. Without the protection of free allocation at that level, the covered producers would face leakage and competitiveness impacts.

Consumption charges should not be seen as mechanisms to contain the risk of leakage from the impact of an ETS. Rather, they are aimed at correcting an important weakness of ETS – the fact that free allocation mutes the carbon price signal for materials down to customer level. The proposal is that free allocation under the ETS would protect against leakage and competitiveness impacts, and consumption charges would fix the problem of free allocation muting the carbon price signal which reaches downstream to the consumer and sectors.

5.1.2 Assessment on the 5 criteria

Environmental benefit:

- The primary benefit of consumption charges is their ability to internalize carbon pricing throughout the value chain of key GHG-intensive materials down to consumer level.

- Consumption charges are well equipped to guard against leakage as a result of their own impacts, since they apply to both imports and domestically produced goods. They do not protect

[19] The EU ETS product specific benchmarks are used to determine the level of free allocation within the ETS, and are set at the average intensity of the 10% lowest-carbon EU producers.

against leakage from increased ambition in an ETS scheme; they are not meant to. They are meant to accompany an ETS, and they rely on the ETS to freely allocate allowances for that purpose. One weakness of this tool, then, is the need for covered sectors to rely on free allocation to protect against leakage and competitiveness impacts – a requirement that could eventually see free allocations in excess of the (declining) cap.

- If the EU benchmark is used as a default value for carbon intensity of materials in imports, the resulting charges are low, and do not directly correspond to the carbon-intensity of actual production; all producers are subject to the same consumption charges regardless of actual carbon content. As such, they would offer domestic and foreign producers no incentives to invest in low-carbon processes.

Competitiveness benefit:

- Consumption charges are well equipped to guard against competitiveness impacts as a result of their own levies, since they apply to both imports and domestically produced goods. And they do so throughout the value chain down to the final consumer. They do not, however, protect against the competitiveness impacts of the ETS; this is the job of free allocation of allowances.

- Consumption charges create incentives to substitute away from covered materials and toward non-covered materials. If the non-covered materials are less GHG-intensive, this may be a desirable and intended result, but it might simply be an artifact of the scope of coverage that has unintended undesirable effects – substituting toward a more GHG-intensive material. As such, the scope of coverage is critically important.

- Removal of the tax liabilities at the point of export relieves exporters of the impacts of the charge when competing in foreign markets.

Legal feasibility

- Since they are framed as an internal measure, they would be obliged to respect the non-discrimination obligations in GATT Article III.4. In most respects they do accord the same treatment to domestic and foreign goods.

- Considered as a joint tool with an ETS, they would take on the same risks as an ETS: specifically, that free allocation would be found in breach of SCM obligations. That risk would increase if the covered materials were granted special status, for example if their high levels of free allocation were retained while other sectors' levels were reduced.

Technical and Administrative feasibility

- The use of existing values such as the product-specific benchmarks and EU ETS prices would make the regime easier to administer.

- A narrow scope of focus also makes consumption charges easy to administer.

- The system of liability records to be passed down the value chain to finished products would be complex to manage and to police, especially for manufactured consumer goods.

- It would be difficult for many foreign producers to track the weight of covered materials in their products –requiring entirely new systems of account.

- Where foreign producers did not declare those weights, it would be difficult to maintain a roster of default values for material weights in a range of semi-finished and manufactured products.

Political and diplomatic feasibility

- From the perspective of trading partners, consumption charges would almost certainly be seen as less controversial than BCA since they are internal measures, and relatively non-discriminatory.

- From the perspective of domestic constituencies, a regime that involved just consumption charges in combination with an ETS would face resistance from those that want to see free allocation scaled back. This is because consumption charges do not themselves provide protection against the leakage and competitiveness impacts of the ETS; free allocation at levels above the actual benchmark would have to stay in place to address those impacts.

5.1.3 Discussion: key strengths and weaknesses

A key strength of consumption charges is that they are able to impose a carbon price throughout the value chain—from primary producer, to processor, to final consumer—for carbon-intensive materials. But they do so within a carbon pricing regime (the ETS) that shelters the producers of those materials from competitiveness and leakage impacts, by freely allocating allowances. Consumption charges thus supplement the ETS, giving the consumer a price signal that otherwise would not exist.

Another strength is the high likelihood that such a regime if carefully constructed would be found legal under international trade rules, and the related likelihood that it would cause little political friction with trading partners.

Another weakness is rooted in the proposed use of product benchmarks to estimate carbon intensity of goods. While this does result in a carbon price being transmitted along the value chain, the price is not well connected to actual carbon emissions, since high and low intensity operations pay the same charge. The result is a lack of incentives for producers to decarbonize their processes. This makes sense only if we assume that decarbonization is not feasible, and that we need to encourage consumers to substitute away from the covered materials.

5.2 Contracts for difference

5.2.1 Description

	Option	Environmental Benefit	Competitive-ness Benefit	Legal Feasibility	Technical & Administrative Feasibility	Political & Diplomatic Feasibility
Contracts for Difference (CfD)	*"Carbon Contracts for Difference" as proposed by Sartor & Bataille (2019)*	*Strong environmental benefit. Can help overcome investor risk aversion for first-of-a-kind low-carbon projects to overcome the technology valley of death; helps reflect the social cost of carbon, which the EU ETS currently does not*	*Improves competitiveness of low-carbon products relative to all carbon-intensive goods with lower CapEx/OpEx; also hedges against leakage vis-à-vis foreign products, but only for selected projects in the near term (and for domestic low-carbon products more generally in the long term)*	*Low risks under EU state aid rule and WTO law. Competitive bidding process is a must for compliance with EU state aid rules, openness to foreign bidders important under WTO rules*	*Relatively straightforward, since limited data requirements: production level, product benchmark and substitution rate. Can piggyback on EU ETS*	*Less controversial than BCA, since it does not apply specifically to imports or exports. Political economy of CfDs generally favorable*

Carbon contracts for difference (CCfDs) offer a project-based policy tool to address the challenge of commercializing low-carbon technologies in the industrial sector, providing a means of reducing risk in capital-intensive projects with long investment periods by effectively guaranteeing a certain return for the incremental costs of an investment that delivers emissions reductions below the current best available technology (Acworth et al., 2020).

Loosely based on the idea of a feed-in premium, the CCfD covers the difference between a variable reference price and a fixed (contracted and guaranteed) strike price, but instead of doing so for the price of energy as a feed-in premium does, it pays out the difference between the strike price and a variable carbon price such as the price of allowances in an ETS. Whenever the allowance price falls below the strike price, the CCfD is triggered, resulting in a payment from the contracting partner of the CCfD, probably, but not necessarily a government authority. If the ETS price rises above the strike price, however, no payment takes place; in fact, the CCfD can even be designed to require a repayment from the beneficiary to the contracting partner (Sartor & Bataille, 2019).

What CCfDs thus offer is an assurance about the future trajectory of carbon prices in the form of a fixed price for certain emissions reductions. Since carbon prices in most jurisdictions are still far too low to make carbon-neutral technologies for many EITE industries economically viable, a CCfD will serve to guarantee the substantially higher carbon price needed to enable investments in technologies producing low- and ultra-low carbon materials.

Procedurally, a CCfD could be implemented through a competitive tendering process (e.g. a reverse auction) for projects resulting in the production of such material, where the most cost-effective bids are awarded a CCfD for a fixed duration such as 20 years. Revenue to fund the CCfD could be sourced from other climate policies, such as a carbon tax or ETS, or even a BCA.

In order to determine the amount to be paid under the CCfD, the producer would identify the quantity of the relevant product it has produced, as well as the emissions thereby avoided. Existing benchmarks, for instance under the EU ETS, could provide the required counterfactual information to calculate avoided emissions relative to conventional products. A further refinement of this process could require independent verification of production data, avoided emissions and incremental costs (Sartor & Bataille, 2019).

5.2.2 Assessment on 5 criteria

Environmental benefit:

CCfDs offer a clear environmental benefit as a result of the ability of new technologies to come to the market. They contribute to the creation of a market for low carbon products. In a very targeted way, they can help overcome investor risk aversion for first-of-a-kind low-carbon projects to overcome the technology valley of death. Also, with their ability to guarantee a carbon price that is far above the carbon price levels currently in effect in most jurisdictions, a CCfD helps better reflect the social cost of carbon.

Competitiveness benefit:

A CCfD provides a narrow, but powerful competitiveness benefit: it dramatically improves the competitiveness of low- and ultra-low carbon products relative to conventional carbon-intensive goods with lower capital and operational expenses. In the short run, however, this effect is limited to those products for which a CCfD has been awarded, and only over time will innovation and learning-by-doing effect also extend to other producers. While a CCfD can prevent leakage from the specific projects it covers, however, it does not offer any immediate competitiveness benefits for the sector at large and in particular for incumbent production facilities.

Legal feasibility:

As a pure support policy that is not implemented at the border, a CCfD gives rise to very low legal risk, primarily limited to state aid and WTO subsidy rules. A competitive bidding process is

therefore advisable to improve the likelihood of compliance with state aid rules, and openness to foreign CCfD project developers would be helpful under relevant WTO rules.

Technical and Administrative feasibility

Likewise, a CCfD is relatively straightforward in terms of its administrative viability, since it only gives rise to limited data requirements on production level, product benchmark and substitution rate. Administratively, CCfDs could take advantage of existing rules and procedures for auctions of renewable energy capacity, and link directly to existing climate policies such as an ETS.

Political and diplomatic feasibility

Finally, a CCfD is likely to be far less controversial than a BCA due to the purely territorial application and its nature as a support policy rather than a constraint. Moreover, since CCfDs are not specifically applied to imports or exports, the likelihood of a trade law violation is minimal. As with most support policies, the domestic and international political economy of CCfDs is this likely to be favourable.

5.2.3 Discussion: key strengths and weaknesses

Key strengths of CCfDs include their exceptional ability to improve the competitiveness of low- and ultra-low-carbon products, their favourable domestic and international political economy, the manageable administrative burden associated with their implementation, and the limited legal risks they incur. Proponents have therefore described this policy option as “economically efficient, affordable, compatible with EU state aid law, and easily [fitting] onto existing policy instruments, such as EU ETS and the EU innovation funds” (Sartor & Bataille, 2019).

Still, for all these attractive attributes, CCfDs also suffered from some important weaknesses. In particular, like other support policies, a CCfD relies on the availability of limited public funds and will thus be less viable during times of tight budgets. Information asymmetries can also make it hard for governments to gauge the true cost of bidding technologies and the required carbon strike price, something that competitive bidding processes can alleviate, but not entirely resolve. Finally, on its own, a CCfD may need to be extremely high to enable many first-of-a-kind projects, further aggravating the dependence on limited public funds. Hence, the most suitable application of CCfDs will be for the partial and temporary support of innovative low-carbon producers.

6. Different instruments for different functions

6.1 Discussion: different objectives, different approaches

Policy option	Proposal/Variant	Environmental Benefit	Competitive-ness Benefit	Legal Feasibility	Technical & Administrative Feasibility	Political & Diplomatic Feasibility
Border Carbon Adjustment	*"Most Likely"*	*Extends carbon price to imports & replaces free allocation; but use of averages limits benefits*	*Effectively levels the playing field in the domestic market, but not in foreign markets, nor downstream*	*Should pass muster under WTO law due to Article XX GATT; requires qualified majority vote in the EU Council*	*Intermediate complexity due to data needs and administrative/regulatory framework*	*High degree of controversy as a unilateral, extra-territorial measure*
Consumption Charge	*"Inclusion of Consumption"*	*Internalizes cost of carbon across value chain, but no or limited differentiation*	*Without free allocation only protects against its own competitive-ness impacts*	*Does not impinge on WTO/state aid rules; but may require a unanimous vote in the EU Council*	*High complexity due to data needs and administrative/regulatory framework*	*Likely minimally controversial as purely internal measure, but increases prices → material substitution*
Contracts for Difference	*"Carbon Contract for Difference"*	*Strong incentive to scale up early-stage clean technology; but scope limited to selected projects (and by available resources)*	*Levels the playing field between clean and dirty products, but only affects competition with foreign producers for selected projects*	*Does not impinge on WTO rules if open to foreign bidders; should pass muster under state aid rules if competitive tender*	*Relatively easier to implement due to limited scope and provision of data*	*Relatively least controversial as a support measure*

Issues to be addressed

At the outset of this paper, we described the evolving policy context that has prompted a renewed discussion of BCAs in Europe. There are three main factors driving this debate, each of which have implications for our analysis of BCAs and additional approaches in this section. These factors are:

1. **Continuation of carbon leakage protection**. The initial issue that was identified was that of competitiveness and carbon leakage. With the increased level of ambition triggered by the commitments in the Paris Agreement and the EU decision to reach carbon neutrality by 2050, studies have identified the reality that the current approach to addressing the risk of carbon leakage and impact on competitiveness, through free allocation, will eventually run its course. Some solutions to manage this situation may work, such as the introduction of new sectors, which would insert additional liquidity to be used for free allocation, but inevitably this will run its course.

   This has led to the legitimate and increasingly urgent concern about finding alternative solutions which should run in parallel with what is the current self-evident asymmetry between the EU level of ambition and that of its trading partners. This preoccupation was adopted by the political class and gained recognition through its inclusion in the European Green Deal package and will only increase in profile as new levels of ambition are adopted leading to COP 26 in Glasgow and the accompanying increase in EUA prices.

2. **Impact of free allocation on downstream carbon price signals.** A second issue that was identified is that of the "muting" of the carbon price generated by the EU ETS downstream to the producing sectors' consumer level due to free allocation. The purpose of the EU policy on climate change is not, and should not be, to deindustrialize Europe by lowering levels of production in order to reduce emissions, but to lower the carbon intensity of production whilst sustaining a thriving EU manufacturing industry. Lowering carbon intensity and finding lower carbon substitutes are solutions that are desirable. Lowering production by moving it to other jurisdictions or substituting with imports that do not face the same carbon constraints is not the solution and needs to be avoided.
3. **Creation of a market for low carbon products.** The third issue is that of the obstacles that are preventing the creation of a market for low carbon products. As with all markets, it will require supply and demand. In many cases technological approaches already exist that allow for the production of low carbon products.

   However, the costs of production associated with these low carbon products are in most cases much higher, which makes them uncompetitive until the price of carbon reaches a significantly higher level, in the absence of demand-side measures.

These three fundamental issues need to be addressed and the tools identified earlier in the paper will play different roles and meet different needs. Comparing these tools is one approach, but a more robust approach is to identify what functions each of these tools can address on their own, or possibly in combination. What is needed is to identify approaches that will be realistic to implement, efficient and sustainable. What we need to avoid is comparing apples to oranges, as there will be different tools that will provide different functions and address different needs.

The issue that is currently preoccupying policy makers and stakeholders is the need to increase EU ambition to reach climate neutrality in 2050 -- which is the EU response to the Paris

Agreement goals -- and how to mitigate any impacts in terms of carbon leakage and competitiveness. The principal instrument that is currently being promoted is the BCA, or to use the terminology of the European Commission, the CBAM. Given the analysis that shows that the current practice of free allocation may become impractical in the second half of the 2020s due to the lack of enough free allocation under the current system, the main function of a CBAM would be to avoid leakage by leveling the playing field between domestic products that are subject to a domestic carbon price through an ETS or a carbon tax and imports that will not face the same costs. Realistically, it is seen, at least initially, as applying to commodity-like products.

Another contribution of the CBAM would be to raise funds for different purposes. Some of these funds can be envisaged as going into the general budget, but some would be earmarked for addressing decarbonization efforts, potentially being added to some of the Funds that have already been created.

Domestically, for sectors covered by a CBAM, this instrument would level the playing field between products exposed to domestic carbon prices and external products that are not. The Commission seems to present it as a replacement for free allocation. However, while the details are unknown at this stage, if the CBAM does not provide for export rebates in some way, it will fall short of fully delivering its function, as it will only provide protection to domestic carbon prices in the domestic market, but not in external markets (Evans et al., 2020). If the export issue is not addressed, and if EU industry is not confident that the approach ultimately chosen will be effective in protecting them, there will be strong resistance to the CBAM on its own as a replacement for free allocation.

Free allocation is seen as muting the carbon price signal, and consumption charges have been put forward as a way to address this issue. Consumption charges are therefore seen as complementary to an ETS price signal for energy-intensive products such as steel, glass, cement, etc. Consumption charges cannot replace a broad ETS price, however, since they are much narrower and only apply to primary products (though they apply to those products as contained in a range of manufactured and semi-finished goods).

Consumption charges, as currently proposed (based on weight and not recognizing carbon intensity), do not provide an incentive to decarbonize carbon intensive products - they incentivize an increase in efficiency by discouraging the use of covered materials, and raise the price of the product, providing an incentive for substitution. Given these features, consumption charges cannot be seen as a substitute for an ETS price signal.

The alternative proposal of allowing enough free allocation under the EU to mute the price signal and couple that with a consumption charge, is seen and can be an alternative to a BCA. There are many assumptions that would need to become reality for this alternative to be politically possible and that needs to be taken into account in putting together a framework package that will deliver all the functions enumerated above.

A consumption charge will ensure neutrality for its own price signal as it applies equally based on weight to all products; domestic and external products will be treated the same. However, consumption charges will not provide a response to or protection from prices coming from an ETS or carbon taxes.

Another scenario that needs to be envisaged is one in which a CBAM-type approach (with the necessary provisions) removes the need for the ETS provision of free allocation of allowances in CBAM covered sectors, in which case one of the main functions of the consumption charge (that of un-muting the impact of free allocation) can also be seen as unnecessary.

The third issue that calls for a solution -- that of the early creation of markets for low carbon products -- requires levelling the playing field for low carbon products, which are generally more expensive while the carbon price (and maybe level of ambition) is not high enough to make such low carbon products commercially viable and competitive.

Contracts for difference (CfDs) have been used in the power sector and would allow, when applied to carbon, "to ensure that projects for ultra-low carbon materials face a) a sufficiently reliable, 'investible' carbon price and b) that the price is effectively high enough so deep decarbonisation technologies become commercially viable immediately, and can be commissioned during the coming 5-10 years" (Sartor and Bataille, 2019).

CCfDs can thus be seen as addressing the function of helping to create a market for low carbon products, but they are limited by their narrow project-based scope, the reliance on public funds, and asymmetry of information can make it hard for governments to gauge the true cost of bidding technologies and the appropriate strike price.

Given these limitations, CCfDs are not a substitute for a CBAM or for free allocation overall. Their objective and functions are altogether different. CCfDs can level the playing field between a limited number of supported projects and external products with higher carbon content and lower costs but should more rightly be seen as a key element of a suite of complementary tools than as an overall solution. CCfDs can certainly be an instrument that uses funds raised through some form of CBAM or consumption charge. Overall, CCfDs can be an important and potentially powerful tool, but only with clear and focused application.

6.2 Possibilities for combination of instruments

What is also important is how these tools work together and to what degree they can replace or interact with each other. From the analysis above it is becoming clear that they have different purposes and deliver different functions. In this way they may be seen as synergetic in some cases.

The need for combining policy instruments is readily evident in the case of the CBAM. As a policy tool, it cannot stand alone, as it is meant to provide a solution to address asymmetrical costs arising from some other climate policy. Hence, a future CBAM is not meant to replace the EU ETS, but only accompany it and provide a solution to level the playing field. Still, in that capacity it could be instrumental to the continued viability of the EU ETS by providing potential relief as the availability of free allocation is exhausted. The application of the CBAM itself would need to be targeted, as a CBAM is likely to apply only to selected sectors but putting in place an export rebate will be important to ensure that all the functions mentioned earlier in this section are delivered. In some settings, this could also be temporarily achieved with continued free allocation to enable ambitious decarbonization without leakage where a CBAM may be too complex or risky to apply.

In the face of increasing ambition, a CBAM is a tool that has many advantages, but in our view, it can only be used selectively and with clear purpose. It is not a silver bullet for everything and everyone.

As already mentioned, if CBAMs are put in place in a way that makes the need for free allocation redundant, then one can question the need for consumption charges, as the problem of muted ETS carbon prices loses some of its urgency. In practice, we know that the carbon price will be muffled to some degree even without free allocation because market actors do not always pass the full price on to consumers.

CCfDs are not intended to deliver the functions of a CBAM or free allocation. CCfDs can be seen as synergetic to an ETS while the price of carbon is too low and could be sourced from funds levied through a CBAM, consumption charges or auctioning. CCfDs should not be a one-way street but an instrument for guaranteeing a carbon price level. Given the limited amount of money available a reverse auction may be a useful instrument to consider and it could also be put in place as a financial instrument that will pay while the price is under the strike price or could share benefits when the price is higher than what is needed to make the product commercially viable.

7. Concluding thoughts

Under the Paris Agreement, the international community has committed to a process aimed at a continuous increase in the ambition of climate action towards achievement of common temperature stabilization goals. Yet the Paris Agreement also leaves it to countries to determine themselves how to operationalize such ambition. Heterogeneity of climate action is therefore an inevitability, and independent evaluations of domestic climate action suggest that a majority of efforts are not in line with achievement of the decarbonization objectives agreed under the Paris Agreement (see e.g. Climate Action Tracker, 2020).

What such heterogeneity also gives rise to is the spectre of emissions leakage. For jurisdictions in the process of strengthening their domestic climate efforts to better align with international commitments and the recommendations of climate science, policy debates inevitably extend to the threat of leakage and potential impacts on competitiveness, employment and investment. Until such time as climate action across countries converges around a common definition of the required level of policy ambition, any plan to strengthen domestic climate policies needs to include a solution for the leakage problem.

With its visionary European Green Deal, the EU is signaling a commitment to continued leadership in climate action and charting a comprehensive plan to strengthen various domestic climate policies, including the EU ETS. As a central pillar of the European decarbonization agenda, the EU ETS covers the sectors most likely to face a real risk of leakage: energy-intensive and trade-exposed industries. Not only are these sectors among the most difficult to decarbonize, but the high costs they face in doing so, and the fact that the goods they produce are often traded in deep and liquid global markets, render the need for adequate solutions to the leakage challenge particularly urgent.

As individual elements of the European Green Deal advance through the political and legislative process, Europe's industrial sectors need assurance that whatever solutions are proposed will be effective in preventing leakage and competitiveness impacts. These challenges cannot be left as details to be sorted out later, while ambition proceeds apace. Putting off decisions on design details, or proposing pilot schemes with limited sectoral coverage, will not garner industry support, and the uncertainty will dampen the substantial investments needed to facilitate the low-carbon transition that is so urgently needed.

In this report, we have conducted a detailed breakdown and analysis of BCAs: the main instrument currently under consideration in Brussels to mitigate leakage and competitiveness risks of increased EU climate policy ambition. Ever since Ursula von der Leyen included this tool in her political guidelines for the new European Commission, the discussion around it has seen significant evolution: where, in previous years, mention of BCAs had been met with dismissal or at best scepticism in the hallways of the Berlaymont and in most national capitals, interest in this option – which, with one regional exception, has never really been applied in practice – has now surged.

Our detailed analysis of BCA design elements and options along a set of criteria has revealed a number of insights, including the need to also find a solution to the competitiveness challenges faced by exports, the importance of coverage that is broad enough to avoid merely incentivizing substitution between different carbon-intensive materials, and the intractable challenge of preventing avoidance strategies such as trans-shipment and resource shuffling. We also highlighted the legal uncertainties afflicting virtually every BCA design, and the importance of consistent messaging and a fair and transparent process. These and further difficult design choices, such as how to determine embodied emissions, whether to credit policies in other countries, and how to use the revenue accruing from a BCA, are covered in the body of the report.

Perhaps the most important takeaways from our analysis and the accompanying stakeholder events, however, are these: first, the politics of a BCA will play an outsized role in determining its success relative to the technical and legal challenges most often discussed in the literature.

Second, a BCA is only one of many tools available to policy makers looking to address the twin problem of leakage and competitiveness impacts. Other policy tools can play a pivotal role in talking certain aspects of this problem. Indeed, because no variant of a BCA is free of considerable technical, legal, and political challenges, the only desirable long-term outcome is one in which BCAs are no longer needed.

Thirdly, an issue that is emerging is that of timing and urgency. The CBAM is meant to come after the issue of ambition for 2030 is resolved and the 2050 neutrality is enshrined in law. Signals coming from stakeholders and EU Member States indicate that this cannot be an afterthought but needs to be part of the package. Agreeing to ambition and to the provisions of a CBAM, and understanding the overall framework is a critical element of the EGD.

When it comes to the politics of BCAs, the international dimension is vital. Our international outreach events have revealed legitimate concerns among important trade partners. Risk of trade retaliation and deteriorating trade relations are usually cited as the main concerns at the political level, although impacts on continued climate cooperation and the dynamics of the Paris Agreement and its continuous NDC cycle may be just as detrimental. Encouragingly, however, our interactions also showed that there is scope for common cause in important areas. In order to mitigate risks and seize potential opportunities, the EU will have to deploy a credible engagement and communication strategy vis-à-vis its foreign partners, and do so soon, before it loses control over the narrative.

As for the role of a BCA alongside other policy instruments designed to address the leakage and competitiveness problem, our analysis confirms that BCAs can be a useful part of the solution, but they are not in and themselves a silver bullet. Alongside BCAs, there will also be need for sectorally tailored supporting policies in the areas of R&D, demonstration projects, and government procurement. That is also where one of the instruments discussed in this report, CCfDs, could prove useful. It is an attractive, legally and politically benign tool to selectively

increase the competitiveness of targeted low-carbon technologies. But at the same time, its narrow scope means it is not suited as a scalable policy tool to prevent leakage or – on its own – ensure the decarbonization of entire sectors. Other instruments we do not cover in this report, such as low-carbon product standards, may also need to be explored.

In any case, as noted above, the sooner the final package of decarbonization drivers and leakage protection mechanisms is adopted, the sooner we will also have the certainty in the market needed to justify major investments in low-carbon production.

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