Subsidy-Related Aspects of the EU Carbon Border Adjustment Mechanism (CBAM)

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With the introduction of a Carbon Border Adjustment Mechanism (CBAM), the European Union (EU) hopes to avert greenhouse gas (GHG) emissions leakage by extending the domestic carbon price to imports of certain goods covered by the EU Emissions Trading System (EU ETS). Leakage can also affect exports, however, when European goods lose market share abroad and are substituted by more emissions-intensive goods from third countries. Despite concern about this potential leakage channel, the CBAM does not make any provision for exports and merely requests the European Commission to monitor, periodically report on and if necessary respond to the risk of export-related leakage. This article evaluates the potential for export-related leakage in the context of the CBAM, and discusses different options to address such leakage. In doing so, it also explores the implications of recent efforts to increase support for industrial decarbonization in Europe as a reaction to extensive subsidies introduced under the Inflation Reduction Act (IRA) in the United States, as well as the evolving role of international trade law and the World Trade Organization (WTO).

Keywords: CBAM, EU ETS, border carbon adjustment, carbon leakage, SCM Agreement, subsidies, innovation, exports, Inflation Reduction Act.

1 INTRODUCTION

Since its earliest inception, the European Union Emissions Trading System (EU ETS) – a cornerstone of the policy framework to decarbonize the European electricity and industry sectors[1] – has faced concerns about the impact of carbon pricing on the competitiveness of domestic manufacturing.[2] Such concerns are

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1 Jos Delbeke, *The Emissions Trading Scheme (ETS): The Cornerstone of the EU's Implementation of the Kyoto Protocol,* in *EU Energy Law, Vol. IV: The EU Greenhouse Gas Emissions Trading Scheme* 1 (Jos Delbeke ed. 2006).

2 European Commission, McKinsey & Company, & Ecofys, *Report on International Competitiveness* 51 (2006), https://climate.ec.europa.eu/system/files/2016-11/report_int_competitiveness_20061222_en.pdf (accessed 15 Mar. 2024); for a survey of the role of competitiveness in the negotiating history of the EU ETS, *see* Michael A. Mehling, *Emissions Trading and National Allocation in the Member States: An Achilles Heel of European Climate Policy*, 5 Y.B. Eur. Envtl. L. 113 (2003), doi: 10.1093/oso/9780199278787.003.0005.

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primarily motivated by a fear that industrial production and investment will relocate to jurisdictions with a lower or no carbon price, entailing a loss of domestic employment and economic opportunity. Industrial relocation due to uneven climate policies is not only an economic concern, however: it may also undermine the effectiveness of climate action because mitigation in one region is offset by increased greenhouse gas (GHG) emissions in other regions, a phenomenon known as emissions leakage.[3] In extreme cases, climate action could even lead to a net increase in global emissions when production relocates to regions with higher relative carbon intensity.[4]

For the first two decades of its operation, the EU ETS addressed such concerns by providing a majority of allowances to industrial emitters free of cost, thereby reducing their compliance burden.[5] Owing to the protective effect of free allocation and low average carbon price levels, the empirical literature has found limited evidence to date of emissions leakage under the EU ETS.[6] A rapid acceleration of decarbonization efforts in line with international climate commitments and the European Green Deal (EGD)[7] has recently renewed concerns about industrial competitiveness in the EU, and also contributed to a more than tenfold increase in the carbon price under the EU ETS. Studies of more ambitious climate policy scenarios do indeed project significant future leakage rates.[8] At the same time, free allocation of allowances – a proven measure against emissions leakage[9] – has been shown to mute abatement incentives and generate

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3 IPCC, *Climate Change 2022: Mitigation of Climate Change. Working Group III Contribution to the IPCC Sixth Assessment Report* (2022), https://www.ipcc.ch/report/ar6/wg3 (accessed 15 Mar. 2024).

4 Michael Hoel, *Global Environmental Problems: The Effects of Unilateral Actions Taken by One Country*, 20 J. Envtl. Econ. & Mgmt. 55 (1991), doi: 10.1016/0095-0696(91)90023-C.

5 Angelo Antoci et al., *Free Allocation of Emission Permits to Reduce Carbon Leakage: An Evolutionary Approach,* in Handbook on Trade Policy and Climate Change 76 (Michael Jakob ed. 2022), https://www.elgaronline.com/view/edcoll/9781839103230/9781839103230.00014.xml (accessed 15 Mar. 2024).

6 Antoine Dechezleprêtre, Daniel Nachtigall & Frank Venmans, *The Joint Impact of the European Union Emissions Trading System on Carbon Emissions and Economic Performance*, 118 J. Envtl. Econ. & Mgmt. 102758 (2023), doi: 10.1016/j.jeem.2022.102758; Eugénie Joltreau & Katrin Sommerfeld, *Why Does Emissions Trading under the EU Emissions Trading System (ETS) Not Affect Firms' Competitiveness? Empirical Findings from the Literature*, 19 Climate Pol'y 453 (2019), doi: 10.1080/14693062.2018.1502145; Stefano F. Verde, *The Impact of the EU Emissions Trading System on Competitiveness and Carbon Leakage: The Econometric Evidence*, 34 J. Econ. Surveys 320 (2020), doi: 10.1111/joes.12356.

7 European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal, COM(2019)640 Final* (2019), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN (accessed 15 Mar. 2024).

8 Jared C. Carbone & Nicholas Rivers, *The Impacts of Unilateral Climate Policy on Competitiveness: Evidence From Computable General Equilibrium Models*, 11 Rev. Envtl. Econ. & Pol'y 24 (2017), doi: 10.1093/reep/rew025; Mustafa H. Babiker, *Climate Change Policy, Market Structure, and Carbon Leakage*, 65 J. Int'l Econ. 421 (2005), doi: 10.1016/j.jinteco.2004.01.003.

9 Carolyn Fischer & Alan K. Fox, *Comparing Policies to Combat Emissions Leakage: Border Carbon Adjustments Versus Rebates*, 64 J. Envtl. Econ. & Mgmt. 199 (2012), doi: 10.1016/j.jeem.2012.01.005.

windfall profits,[10] and is therefore viewed as a temporary solution that will need to be abandoned on the path to deep decarbonization.[11]

Against that backdrop, the EU has turned to an alternative policy instrument to limit the risk of emissions leakage: a border carbon adjustment (BCA). As a trade-related measure, a BCA alleviates emissions leakage by extending a domestic carbon constraint such as a carbon price or other regulatory measure to imported goods, providing relief from the domestic carbon constraint for exported goods, or a combination of both.[12] In July 2021, the European Commission published a legislative proposal for a BCA as part of a suite of legislative proposals – the 'Fit for 55' package – to operationalize the EGD.[13] Following the ordinary legislative procedure, the European Parliament and Council reached a provisional agreement on that proposal in December 2022, paving the way for its formal adoption and entry into force in May 2023.[14]

Labelled a 'Carbon Border Adjustment Mechanism' (CBAM), this measure will successively replace free allocation of allowances as the primary safeguard against emissions leakage under the EU ETS. To do so, it extends the carbon price applied under the EU ETS to the emissions associated with imports of six product categories – cement, iron and steel, aluminium, fertilizer, electricity, and hydrogen – based on verified emissions data from foreign producers or default assumptions about the carbon intensity of these goods. Since October 2023, importers are required to declare the emissions embedded in covered goods entering the customs territory of the EU. From 2026, importers will additionally need to purchase and annually surrender certificates in an amount equal to the declared emissions from the preceding year, with certificates priced at the same level as EU ETS allowances.

As adopted, the CBAM only applies to goods imported into the EU, however, and makes no adjustment for goods exported from the EU into international markets. Instead, the CBAM Regulation merely instructs the European Commission to 'assess the effectiveness of the CBAM in addressing the carbon

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[10] Jos Sijm, Karsten Neuhoff & Yihsu Chen, *CO2 Cost Pass-Through and Windfall Profits in the Power Sector*, 6 Climate Pol'y 49 (2006), doi: 10.1080/14693062.2006.9685588; Frédéric Branger et al., *EU ETS, Free Allocations, and Activity Level Thresholds: The Devil Lies in the Details*, 2 J. Ass'n Envtl. & Res. Economists 401 (2015), doi: 10.1086/682343.

[11] Michael Jakob, *Climate Policy and International Trade – a Critical Appraisal of the Literature*, 156 Energy Pol'y 112399 (2021), doi: 10.1016/j.enpol.2021.112399.

[12] Going back to James R. Markusen, *International Externalities and Optimal Tax Structures*, 5 J. Int'l Econ. 15 (1975), doi: 10.1016/0022-1996(75)90025-2.

[13] European Commission, *Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism, COM(2021)564 Final* (2021), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52021PC0564 (accessed 15 Mar. 2024).

[14] European Union, *Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 Establishing a Carbon Border Adjustment Mechanism*, PE/7/2023/REV/1 52 (2023), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R0956 (accessed 15 Mar. 2024).

leakage risk for goods produced in the Union for export to third countries' and to report its findings, along with any appropriate legislative proposals, to the European Parliament and to the Council every two years.[15] Although the foregoing provision thus acknowledges the possibility of export-related leakage – a situation when European goods lose market share abroad and are substituted by more emissions-intensive goods from third countries – it defers a solution. This has proven to be one of the more contentious design choices in the debate preceding adoption of the CBAM, not least because the European Commission itself projected a loss of market share for EU exports in its impact assessment of the legislative proposal.[16]

Going forward, policy makers in the EU will continue to face pressure to monitor the risk of export-related emissions leakage and identify suitable responses. Recent international developments, including Congressional passage of legislation affording generous fiscal subsidies to industrial decarbonization in the United States, will add further impetus to the political discussion of support measures for European export industries. To inform that process, the following sections provide further detail on the risk of export-related leakage (section 2) and trace the relevant legislative and political debate, and how the final CBAM outcome addresses export-related leakage (section 3). The main section of this article identifies policy options to address export-related leakage through changes to the CBAM as well as flanking measures, and evaluates these options with a view to their environmental effectiveness as well as legal, economic and political implications (section 4). The final section offers overall conclusions, and includes an outlook on possible reforms to the World Trade Organization (WTO), international trade law, and European state aid rules to enable expanded use of subsidies for industrial decarbonization (section 5).

2 CARBON LEAKAGE AND EXPORTS

The debate on carbon leakage mainly focuses on the prospect that, without dedicated anti-leakage policies, higher costs for EU producers due to climate policy would reduce their production. At the same time, they would incentivize imports of carbon-intensive products from countries with less ambitious climate policies. In this case, emissions would be reduced in the EU, but additional GHG emissions would occur in third countries to meet the additional demand for

[15] European Union, *supra* n. 14, Art. 30(5).

[16] European Commission, *Commission Staff Working Document Impact Assessment Report Accompanying the Document Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism, SWD(2021) 643 Final* 65–66 (2021), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021SC0643 (accessed 15 Mar. 2024).

carbon-intensive imports to the EU.[17] Such carbon leakage would reduce the effectiveness of EU measures to reduce global emissions.

Yet, by raising production costs for EU firms, climate policies also may have competitiveness implications on the global market. That is, even with a CBAM in place to establish a level playing field on the domestic EU market, EU producers might still lose market shares in third markets to competitors that can produce at lower costs because of less stringent climate measures in the countries in which they are based.[18] As a consequence, additional emissions will be released in third countries to meet increasing demand for non-EU suppliers. This may – at least partly – undermine emission reductions achieved within the EU. In most sectors, the average carbon intensity of EU-based manufacturers is lower than that of their foreign competitors.[19] If foreign producers have significantly higher carbon intensities than EU producers, crowding out of relatively 'clean' European products by substantially 'dirtier' foreign ones could even increase global emissions. As the EU accelerates its decarbonization efforts under the EGD, the relative differences in carbon intensity between European and foreign goods could potentially increase, exacerbating the risk and potential scale of export-related leakage.

Modelling studies suggest that a BCA that only applies to imported goods would be less effective in limiting carbon leakage than a BCA that covers both imports and exports.[20,21] Indeed, in its own impact assessment of the legislative proposal, the European Commission projected a 6.8% loss of market share for EU exports from a CBAM design that only covers imports while resulting in a withdrawal of free allowances.[22] One reason for the leakage risk affecting European exports is the export intensity of European industries more generally. Many European manufacturers of goods that fall within the scope of the CBAM also sell their products outside the EU, with exports constituting a significant share of turnover in some affected sectors and regions.

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17 Michael Jakob, *Why Carbon Leakage Matters and What Can Be Done against It*, 4 One Earth 609 (2021), doi: 10.1016/j.oneear.2021.04.010.

18 Jakob, *supra* n. 11, at 112399.

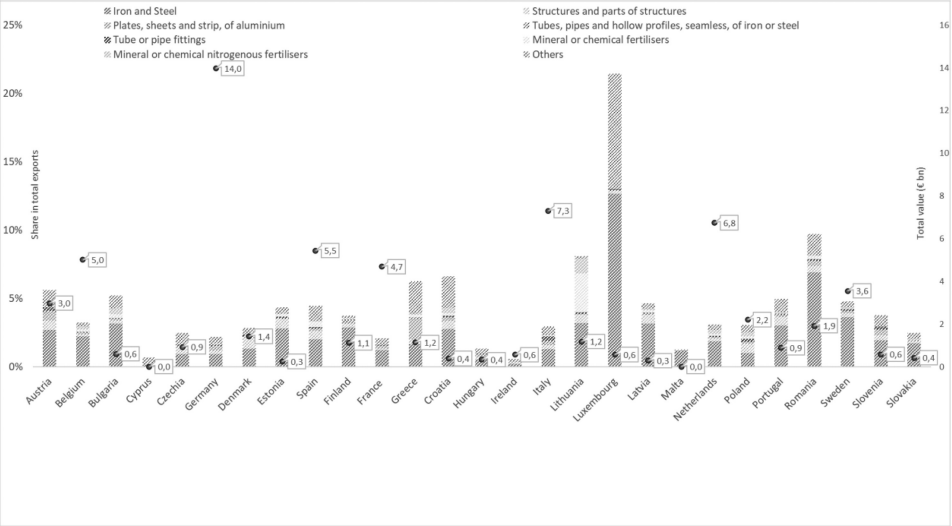
19 Richard Wood et al., *The Structure, Drivers and Policy Implications of the European Carbon Footprint*, 20 Climate Pol'y S39 (2020), doi: 10.1080/14693062.2019.1639489.

20 Stéphanie Monjon & Philippe Quirion, *A Border Adjustment for the EU ETS: Reconciling WTO Rules and Capacity to Tackle Carbon Leakage*, 11 Climate Pol'y 1212 (2011), doi: 10.1080/14693062.2011.601907.

21 Christoph Böhringer, Edward J. Balistreri & Thomas F. Rutherford, *The Role of Border Carbon Adjustment in Unilateral Climate Policy: Overview of an Energy Modeling Forum Study (EMF 29)*, 34 Energy Econ. S97 (2012), doi: 10.1016/j.eneco.2012.10.003.

22 European Commission, *supra* n. 16, at 65–66.

Figure 1 Share of CBAM-Relevant Sectors in Total Exports to Non-EU Countries (Bars, Left y-Axis) and Value of Export of CBAM-Relevant Sectors (Dots, Right y-Axis), by Member State and Product Category



In 2022, the total value of exports in CBAM-relevant sectors to non-EU countries amounted to about EUR sixty-five bn (due to the complex regulations under the CBAM, we do not include electricity, which only accounts for a small share of exports from CBAM sectors, in our discussion). This corresponds to almost 3% of exports to countries outside the EU and slightly less than 0.3% of EU GDP.[23]

There are seven sectors that each account for a share of more than 3% in CBAM-relevant exports from the EU to third countries. Together, they account for more than 80% of all exports in CBAM-relevant sectors. 'Iron and steel' constitutes the dominant sector, which alone accounts for more than half of all CBAM-relevant EU exports. Processed goods containing iron and steel, such as 'structures and parts of structures', 'tubes, pipes and hollow profiles' and 'tube or pipe fittings' also display substantial export volumes.

The share of exports varies substantially across Member States (*see* Figure 1). For many countries in the EU, CBAM-relevant sectors account for only a minor fraction of total exports to third countries. However, for Luxemburg this share is

[23] Source: EUROSTAT EU trade since 1988 by HS2-4-6 and CN8, https://ec.europa.eu/eurostat/databrowser/bookmark/cba25a95-1324-4864-b211-de52924ff2fd?lang=en (accessed 15 Mar. 2023).

more than 20%, for Romania almost 10% and more than 5% for Austria, Bulgaria, Greece, Croatia and Lithuania.

The empirical evidence presented above suggests two tentative conclusions: first, options to address export-related carbon leakage will likely need to put a strong focus on the iron and steel industry. Second, they will have important distributional consequences across EU Member States, as those with higher shares of exports in CBAM-relevant sectors will benefit more from schemes to support competitiveness of these exports on the world market. This provides a motivation to adopt safeguard measures to address export-related carbon leakage.[24]

3 EXPORT-RELATED LEAKAGE IN THE CBAM

In the first announcement of a European 'Carbon Border Tax' in July 2019 as part of her political guidelines, incoming European Commission President Ursula von der Leyen did not yet mention the trade flows to which this measure would apply.[25] Subsequent documents referring to the CBAM merely identified it as a measure applied to imports. A communication on the EGD published by the European Commission in December 2019, for instance, specified that the CBAM 'would ensure that the price of imports reflect more accurately their carbon content'.[26] Similarly, a document issued by the European Commission in March 2020 as part of the Inception Impact Assessment only identified options that would apply either to imports or to imports and domestic products.[27] Coverage of exports was first mentioned in several submissions to the ensuing stakeholder consultation, regarding which the summary report compiled by the European Commission acknowledged that 'most participants argued that the possibility to grant a rebate to EU exporters should be explored under the CBAM'.[28]

By this point, it had become clear that industrial stakeholders, in particular, were concerned about their competitiveness in international export markets if a

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[24] Stuart Evans et al., *Border Carbon Adjustments and Industrial Competitiveness in a European Green Deal*, 21 Climate Pol'y 307 (2021), doi: 10.1080/14693062.2020.1856637; Andrei Marcu, Michael A. Mehling & Aaron Cosbey, *Border Carbon Adjustments in the EU* (2020), https://ercst.org/border-carbon-adjustments-in-the-eu-issues-and-options (accessed 15 Mar. 2024).

[25] Ursula von der Leyen, *Political Guidelines for the Next European Commission 2019-2024* (2020), https://data.europa.eu/doi/10.2775/101756 (accessed 15 Mar. 2024).

[26] European Commission, *supra* n. 7.

[27] European Commission, *EU Green Deal (Carbon Border Adjustment Mechanism): Inception Impact Assessment. Ref. Ares(2020)1350037* (2020), https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-EU-Green-Deal-carbon-border-adjustment-mechanism-_en (accessed 15 Mar. 2024).

[28] European Commission, *EU Green Deal (Carbon Border Adjustment Mechanism). Public Consultation: Summary Report, Ares(2021)70541* (2020), https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-EU-Green-Deal-carbon-border-adjustment-mechanism-/public-consultation_en (accessed 15 Mar. 2024).

CBAM covering only imports set in motion a gradual decline of freely allocated allowances, exposing goods to the full carbon price. This concern also translated into stakeholder pressure during the political deliberations, as first became evident in the 'Own Initiative' resolution of the European Parliament adopted in March 2021. For the first time, that resolution acknowledged the importance of 'assessing the impact on exports', and urged the European Commission 'to consider the possible introduction of export rebates'.[29] Nonetheless, the legislative proposal released by the European Commission in July 2021 made no mention of leakage related to, let alone extended the scope of the CBAM to, exports.[30] In their reactions to the draft regulation, several trade associations singled out the absence of any safeguard for exports as a primary concern,[31] prompting the subsequent emergence of conceptual proposals from both industry[32] and environmental policy think tanks.[33]

Late in 2021, several committees in the European Parliament began weighing in on the proposed regulation, evidencing continued preoccupation with the impact of the CBAM on exports. In a draft report, the rapporteur of the Committee on the Environment, Public Health and Food Safety (ENVI) called on the European Commission to report on the impact on exports and, if it finds a 'significantly negative impact on the competitiveness of the export of goods' and 'a risk of carbon leakage on those exports', to present a legislative proposal 'to eliminate such effect and risk' in a manner that respects WTO rules and does not cause distortions in existing trading patterns.[34] Other relevant committees

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[29] European Parliament, *A WTO-Compatible EU Carbon Border Adjustment Mechanism, P9_TA(2021) 0071* (2021), https://www.europarl.europa.eu/doceo/document/TA-9-2021-0071_EN.html (accessed 15 Mar. 2024).

[30] European Commission, *supra* n. 13.

[31] *See* e.g., the statement of an umbrella association of European industry groups and companies, AEGIS Europe, *CBAM EC Proposal: EU Industries Oppose the Automatic Phase-out of Free Allowances, and Call for Export Adjustments and Better Enforcement Provisions* (2021), http://www.aegiseurope.eu/news/cbam-ec-proposal-eu-industries-oppose-the-automatic-phase-out-of-free-allowances-and-call-for-export-adjustments-and-better-enforcement-provisions-1 (accessed 15 Mar. 2024).

[32] Hervé Jouanjean et al., *WTO Consistency of 'Export Adjustments' in the Context of the EU Emissions Trading System (Incorporating a Carbon Border Adjustment Mechanism)* 11 (2021), https://static1.squarespace.com/static/5537b2fbe4b0e49a1e30c01c/t/61e591f6ee4baf0f9903d9ad/1642435063985/AEGIS+Europe+-+Exports+Adjustments-+WTO+Legal+Analysis+-+KS+and+NCTM+-+Confidential+28+June+2021.pdf (accessed 15 Mar. 2024).

[33] Andrei Marcu et al., *Addressing Exports in the EU Carbon Border Adjustment Mechanism* (2022), https://ercst.org/wp-content/uploads/2022/03/20220318-Summary-for-Policymakers.pdf; Oliver Sartor, Aaron Cosbey & Aylin Shawkat, *Getting the Transition to CBAM Right: Finding Pragmatic Solutions to Key Implementation Questions* (2022), https://static.agora-energiewende.de/fileadmin/Projekte/2021/2021_09_IND_Climate_Trade_CBAM_1/A-EW_250_CBAM_WEB.pdf (accessed 15 Mar. 2024).

[34] European Parliament, Committee on the Environment, Public Health and Food Safety (ENVI), *Draft Report on the Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism, 2021/0214(COD)* (2021), https://www.europarl.europa.eu/doceo/document/ENVI-PR-697670_EN.pdf (accessed 15 Mar. 2024), Art. 30(3a) and (3b).

went further, including the Committee on Industry, Research and Energy (ITRE), whose rapporteur cited the impact assessment and its finding that a CBAM limited to imports would reduce the competitiveness of European exports, and therefore concluded that the withdrawal of free allowances 'should only start once the Commission establishes a mechanism to prevent such carbon leakage on export markets'.[35]

As a next step in the legislative procedure, the Council adopted a 'General Approach' in March 2022 reflecting views of the Member States on the topic. It mandated the European Commission with the provision of a report every two years, starting before the end of 2025, that contains 'an assessment of the impact of the mechanism on carbon leakage, including in relation to exports' and accompanying that report, 'if appropriate', by a legislative proposal.[36] While this Council proposal channelled some concern on the part of individual Member States about the potential impact of the CBAM and the loss of free allocation on the competitiveness of European export industries, it was more measured in terms of the envisioned policy response. Meanwhile, members of the European Parliament introduced several hundred amendments to the legislative proposal, reflecting divergent views on central aspects of the CBAM design including the issue of trade flows and coverage of exports.

A plenary vote in the European Parliament in June 2022 narrowed down the amendment proposals, mirroring the Council's request for an annual report by the European Commission before the end of 2025 and every year thereafter, assessing, among other things, 'the effectiveness of the CBAM in addressing the carbon leakage risk for goods produced in the Union for export to third countries'.[37] Going beyond the Council, it also proposed retaining free allocation of allowances for products 'produced for export to third countries without carbon pricing mechanisms similar to the EU ETS' and requested, if appropriate, that the European Commission present 'a legislative proposal … by 31 December 2026, assessing in particular potential export adjustment mechanisms for installations

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[35] European Parliament, Committee on Industry, Research and Energy (ITRE), *Draft Opinion on the Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism, 2021/0214(COD)* (2022), https://www.europarl.europa.eu/doceo/document/ITRE-PA-703112_EN.pdf (accessed 15 Mar. 2024), Recital 11(b).

[36] Council of the European Union, *Draft Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism: General Approach, 2021/0214(COD)* (2022), https://data.consilium.europa.eu/doc/document/ST-7226-2022-INIT/en/pdf (accessed 15 Mar. 2024), Art. 30(2) to (4).

[37] European Parliament, *Amendments Adopted by the European Parliament on 22 June 2022 on the Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism, P9_TA(2022)0248* (2022), https://www.europarl.europa.eu/doceo/document/TA-9-2022-0248_EN.html (accessed 15 Mar. 2024), Amendment 161, Art. 31(2a).

belonging to the 10% most efficient installations … in the light of WTO compatibility or any other proposals the Commission deems appropriate'.[38]

In the trilogue negotiations, however, the Council prevailed with the more measured process it had endorsed in its 'General Approach'. The agreement that emerged from the trilogue process in December 2022 merely calls for 'an assessment of the impact of the mechanism on carbon leakage, including in relation to exports' in the periodic reporting of the European Commission.[39] Starting every two years from the end of the transitional period, Article 30(5) of the final regulation further mandates the European Commission with assessing 'the effectiveness of the CBAM in addressing the carbon leakage risk of goods produced in the Union for export to third countries which do not apply the EU ETS or a similar carbon pricing mechanism' and, where the report affirms the existence of such carbon leakage risk, with presenting 'a legislative proposal to address that risk in a manner that is compliant with WTO rules and takes into account the decarbonisation of installations in the Union'.[40]

While this outcome of the legislative process goes beyond the initial proposal of the European Commission and at least acknowledges the possibility of export-related leakage and the potential need for a response, it still met with criticism from industrial stakeholders as a failure to address industry concerns.[41] Even environmental advocacy groups – which initially rejected calls for export rebates on the grounds that these risked 'creating perverse incentives whereby more carbon-intensive production is redirected towards export'[42] – have come to identify the deep divisions on this issue as a political barrier to one of their priority objectives, namely the accelerated withdrawal of free allocation. Such lingering concern on the part of influential stakeholders, coupled with the agreed mandate to periodically assess and report on the risk of leakage for exported goods, guarantee that the topic and any related policy proposals will remain politically relevant in coming years.

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38 *Ibid.*, Amendment 262, Art. 31(1b).

39 European Union, *supra* n. 14, Recital 65.

40 *Ibid.*, Art. 30(5); *see also* the mandate to assess, by 31 Dec. 2024, the 'carbon leakage risk for goods subject to CBAM and produced in the Union for export to third countries which do not apply the EU ETS or a similar carbon pricing mechanism', European Union, *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC,* OJ L 275/32 (2003), as amended in 2023, Art. 10a(1a).

41 AEGIS Europe, *Trilogue Outcome on CBAM & ETS Leaves EU Without Proper Export Solution or Strong Anti-circumvention Rules* (20 Dec. 2022), http://www.aegiseurope.eu/news/trilogue-outcome-on-cbam-amp-ets-leaves-eu-without-proper-export-solution-or-strong-anti-circumvention-rules (accessed 15 Mar. 2024).

42 Agnese Ruggiero, *Joint NGO Statement on the Carbon Border Adjustment Mechanism* (2021), https://carbonmarketwatch.org/wp-content/uploads/2021/12/Joint-NGO-statement-on-CBAM-proposal-final.pdf (accessed 15 Mar. 2024).

4 OPTIONS TO ADDRESS EXPORT-RELATED LEAKAGE

As mentioned in the previous section, the political and legislative discussion around export-related leakage under the CBAM has resulted in several proposals to introduce additional leakage safeguards for exported products. Often summarily – and imprecisely – referred to as 'export rebates',[43] these proposals have taken various shapes, from continued free allocation or financial compensation for exporters to compliance exemptions and targeted support measures. While each of these approaches offers exporting producers some relief from the cost of complying with the EU ETS, they differ substantially in their conditions and implications. For our assessment of options to address export-related leakage, we therefore avoid the term 'export rebates' and instead distinguish between different approaches to levelling the playing field for European exports covered by the CBAM. These are: free allocation of emission allowances, financial compensation, exemptions from EU ETS compliance, consumption charges, and targeted innovation support. Each option is described in the following subsections, along with a brief evaluation of their environmental, economic, and legal implications.

4.1 Free allocation of allowances

As described earlier, the current approach to address carbon leakage consists in allocating emission allowances to covered facilities in energy-intensive or trade-exposed sectors to reduce the costs they incur to comply with EU climate policy. Even though these emission allowances are awarded for free, they have economic value, as emitters can sell them on the allowance market. A decision not to reduce emissions thus entails the 'opportunity cost' of being unable to sell the corresponding emission allowances. European installations holding free allowances thus have an incentive to reduce their emissions intensity. They will also pass through the carbon price to final consumers (especially in competitive markets; concentrated markets in which few firms have considerable market power typically display incomplete pass-through, such that consumers are not affected by the full extent of the carbon price).[44] Higher prices of carbon-intensive goods in turn provide an incentive to reduce their consumption, thus reducing emissions.

Free emission allowances accrue to producers of goods deemed at risk of carbon leakage, a status that is determined on the basis of energy intensity, trade exposure, or a

[43] *See* e.g., Giulia Claudia Leonelli, *Export Rebates and the EU Carbon Border Adjustment Mechanism: WTO Law and Environmental Objections*, 56 J. World Trade 963 (2022), doi: 10.54648/TRAD2022040.

[44] Ralf Martin et al., *On the Empirical Content of Carbon Leakage Criteria in the EU Emissions Trading Scheme*, 105 Ecological Econ. 78 (2014), doi: 10.1016/j.ecolecon.2014.05.010.

combination of both, and reflected in a leakage list.[45] Emitters in these sectors obtain free allowances based on historical production levels multiplied by product benchmarks, which reflect the average carbon intensity of the 10% best performing installations producing the goods included in the leakage list. While these 10% best performers thus obtain sufficient free allowances to cover the entirety of their emissions, the remaining producers experience a shortfall in allowances, with the periodically updated product benchmarks creating an additional incentive to reduce carbon intensity. Importantly, however, emitters obtain free allowances regardless of whether they produce goods for the EU or the non-EU market, ensuring that free allocation is not contingent on export performance and thus at risk of being considered an export subsidy. For exporters, free allocation is hence more favourable than the CBAM, which only levels the playing field on the internal, but not on the global, market.

Free allocation of emission allowances faces several shortcomings, however. Perhaps the most important weakness is the dwindling supply of emission allowances under the EU ETS as the EU accelerates its committed pathway to a net-zero economy. Even once emissions have been reduced to net zero, some residual emissions will remain that need to be offset by way of carbon dioxide removal activities. It seems unlikely, however, that the corresponding amount of allowances remaining in the EU ETS at that point will be sufficient to compensate all EU producers that face a risk of carbon leakage.[46] Continued free allocation at current or even significantly reduced levels is thus fundamentally inconsistent with longer-term decarbonization of European industrial emitters.

Free allocation of emission allowances also has important implications for public budgets: if the respective allowances were sold at auction instead, they would yield public revenue that could be used to invest in inter alia an accelerated transformation to a net-zero economy. Research has moreover shown that many facilities that have benefited from free allowances in the past cannot be truly considered to be at risk of carbon leakage.[47]

Finally, free allocation of emission allowances also has adverse implications for emission reductions: if the number of allowances awarded is proportional to the quantity of output – in the form of 'output-based rebates' – free allocation provides an incentive to produce a larger quantity of carbon-intensive goods, thus diluting the desired effect of the carbon price.[48] That effect can be avoided if the number of

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45 European Comission, *2014/746/EU: Commission Decision of 27 October 2014 Determining, Pursuant to Directive 2003/87/EC of the European Parliament and of the Council, a List of Sectors and Subsectors Which Are Deemed to Be Exposed to a Significant Risk of Carbon Leakage, for the Period 2015 to 2019 (Notified under Document C(2014) 7809) Text with EEA Relevance* (2014).

46 Jakob, *supra* n. 11.

47 *Ibid*.

48 C. Fischer & A. K. Fox, *Output-Based Allocation of Emissions Permits for Mitigating Tax and Trade Interactions*, 83 Land Econ. 575 (2007), doi: 10.3368/le.83.4.575.

free allowances is instead determined on the basis of historic production levels, as is currently the case under the EU ETS; when based on historic production levels, however, free allocation of allowances can result in substitution of domestic production with imported goods, as this approach carries less incentive for EU firms to maintain their production compared to the case in which allowances depend on actual production.

Given that free allocation of allowances is already the main policy instrument to address emissions leakage under the EU ETS, several proposals to address export-related leakage under the CBAM have involved some form of continued free allocation specifically for exports to level the carbon playing field on the global market. Different approaches to continued free allocation for affected exports are conceivable. Some proposals introduced into the discussion, for instance, have recommended that the withdrawal of free allocation beyond 2026 be suspended for the share of production exported outside the EU, based on an annual declaration – similar to the CBAM declaration required from authorized importers – detailing the volume of exported goods.[49] Another proposal would substitute free 'Export Adjustment Certificates' for allowances, limiting their value to compliance purposes and allowing no transfers or trading under the EU ETS.[50]

In all these cases, free allowances or adjustment certificates would be issued based on the current system of product benchmarks. In other words, this approach would cover only a share of emissions for most producers, and permit allocation could be further curtailed to avoid overcompensation, i.e., a situation in which exporting firms receive more permits than needed to address export leakage concerns. Since exporters would not receive allowances or certificates corresponding to the actual emissions embodied in exports, they would retain an incentive to further reduce the carbon intensity of production. To navigate the challenge of a declining overall supply of allowances under the EU ETS, free allocation for exporters could also be limited to a transitional period. Still, even partial free allocation for exporters would have fiscal consequences, reducing the EU ETS revenue available for other investments, e.g., public spending in decarbonization. Overall, however, the use of free allocation to avert leakage in export markets could be environmentally and economically justified, especially if the foreign products that would otherwise replace European exports in international markets have a significantly higher relative carbon intensity.

A greater barrier facing continued free allocation of allowances for exporters of goods are legal concerns, notably the risk of violating international trade rules on

[49] *See* for instance, Sartor, Cosbey & Shawkat, *supra* n. 33; Jouanjean et al., *supra* n. 32.
[50] Marcu et al., *supra* n. 33.

subsidies and countervailing measures. Such reservations about the legal admissibility of any preferential treatment of exports are what reportedly motivated the EU to exclude exports from the scope of the CBAM,[51] and are also reflected in the consistent emphasis throughout the legislative process that any legislative proposal to address export-related leakage do so 'in a manner that is compliant with WTO rules'.[52] Of primary concern in this regard is the risk that free allocation, if made contingent on export performance (that is, if there is a relationship of conditionality or dependence between the award and exportation), could be considered a prohibited export subsidy under the Agreement on Subsidies and Countervailing Measures (ASCM).[53]

Subsidies are defined in the ASCM as financial contributions by a government that confer a benefit, with financial contributions including direct transfers of funds, foregone government revenue that would otherwise be due, or the provision of goods and services.[54] Because auctioning will become the default approach to distributing allowances once the CBAM begins phasing out free allocation, awarding free allowances to exporters risks being considered foregone government revenue and thus a financial contribution; alternatively, if allowances are classified as a good or a service, their provision could likewise constitute a financial contribution.[55] If the financial contribution can also be shown to have conferred a benefit, the conditions for existence of a subsidy would be met.

Indeed, the US Department of Commerce has already found free allocation under the EU ETS to be a countervailable subsidy even prior to the introduction of the CBAM.[56] This finding is not necessarily dispositive of how the WTO Dispute Settlement Body (DSB) would decide a comparable case, and good arguments can be cited against considering free allowances a subsidy. In the underlying investigation, for instance, the European Commission argued that 'free allowances are not 'otherwise due' as they form an inherent component of the ETS and that, thus, 'the government has not given up its entitlement to collect revenue since there never was such entitlement by the government in the first

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51 Rebecca Gualandi & Ben Garside, *Industry Groups Urge EU to Include Export Support in Carbon Border Measures*, Carbon Pulse (6 Dec. 2022), https://carbon-pulse.com/183496 (accessed 15 Mar. 2024).

52 Council of the European Union, *supra* n. 36, Recital 52.

53 World Trade Organization, *Agreement on Subsidies and Countervailing Measures* (1994), Art. 3.1(a).

54 *Ibid.,* Art. 1.1(a)(1).

55 The legal classification of emission allowances under international trade law remains a matter of debate, *see* James Munro, *Emissions Trading Schemes under International Economic LAW* (2018), https://global.oup.com/academic/product/emissions-trading-schemes-under-international-economic-law-9780198828709?cc=us&lang=en (accessed 15 Mar. 2024), Chs 2 and 3.

56 *Forged Steel Fluid End Blocks from the Federal Republic of Germany and Italy: Final Affirmative Countervailing Duty Determination*, Federal Register vol. 85, No. 239 80011 (2020), https://www.federalregister.gov/documents/2020/12/11/2020-27335/forged-steel-fluid-end-blocks-from-the-federal-republic-of-germany-final-affirmative-countervailing (accessed 15 Mar. 2024).

place'.[57] Pursuant to the European Commission, free allowances could not 'be seen as any other form of financial contribution, because they do not involve any transfer of funds of any type, nor do they involve any provision of goods or services'.[58]

Should free allowances be found to constitute a financial contribution, the European Commission submitted that free allocation still conferred no benefit because it forms 'an integral part' of a single system that has to be seen in its entirety rather than being 'cut … into pieces and parts' and taken 'out of context in order to make a biased assessment'.[59] Advocates of a safeguard against export-related leakage under the CBAM have drawn on this line of argument to suggest that free allocation merely 'calibrates the regulatory obligation and lessens the net regulatory burden imposed under' the integrated regime created by the EU ETS.[60] According to this argument, free allowances for exporters would not constitute a subsidy and instead merely diminish what remains a net burden for domestic producers.

A second pathway to justify continued free allocation to exporters alongside introduction of the CBAM can be based on a footnote to the ASCM that allows remitting indirect taxes upon export if such remission does not exceed the tax levied on like products sold for domestic consumption.[61] Because emitters covered by the EU ETS are required to purchase allowances from the state and obtain no direct benefits in return, proponents of this pathway have argued that the EU ETS constitutes a tax.[62] Interpreting the EU ETS as a tax would contradict the jurisprudence of the European Court of Justice (ECJ), however, which in past case law has determined that the EU ETS cannot 'be regarded as constituting a customs duty, tax, fee or charge'.[63] Still, there is no universally valid definition of

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57 European Commission, *Anti-Subsidy Investigation Concerning Imports of Fluid End Blocks from,* Inter Alia*, Italy (Ref. C-475-841): Submission by the European Commission* (2020), https://access.trade.gov (accessed 15 Mar. 2024).

58 *Ibid*.

59 European Commission, *Anti-Subsidy Investigation Concerning Imports of Fluid End Blocks from, inter alia, Italy (Ref. C-475-841): Comments by the European Commission before preliminary determination* (2020), https://access.trade.gov (accessed 15 Mar. 2024)

60 Jouanjean et al., *supra* n. 32.

61 World Trade Organization, *supra* n. 53, Footnote 1.

62 Javier de Cendra, *Can Emissions Trading Schemes Be Coupled With Border Tax Adjustments? An Analysis Vis-à-Vis WTO Law*, 15 Rev. Eur. Community & Int'l Envtl. L. 131 (2006), doi: 10.1111/j.1467-9388.2006.00518.x; Roland Ismer & Karsten Neuhoff, *Border Tax Adjustment: A Feasible Way to Support Stringent Emission Trading*, 24 Eur. J. L. & Econ. 137 (2007), doi: 10.1007/s10657-007-9032-8; Joost Pauwelyn, *Carbon Leakage Measures and Border Tax Adjustments under WTO Law*, in *Research Handbook on Environment, Health and the WTO* 448 (Geert van Calster & Denise Prévost eds 2013), https://www.elgaronline.com/view/edcoll/9781847208972/9781847208972.00024.xml (accessed 15 Mar. 2024).

63 Air Transport Association of America *v*. Secretary of State for Energy and Climate Change, ECLI:EU:C:2011:864 (2011), https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:62010CJ0366 (accessed 15 Mar. 2024).

taxes, and what a WTO panel considers a tax could differ from the understanding of the ECJ. Nevertheless, even if the EU ETS were considered a tax, a further question would arise as to whether the price on emissions can be considered an indirect tax 'borne by the … product', as required by the relevant footnote in the ASCM, or rather represents a *taxe occulte* whose adjustability is contested.[64] And finally, even if that hurdle should be taken, the EU would still have to ensure that the free allocation for exports never exceeds the compliance obligation borne by producers for the internal market, raising potential administrative challenges.[65]

Overall, it is thus possible to formulate a credible argument that continued free allocation to exporters under the CBAM does not constitute a prohibited subsidy under the ASCM. Still, the determination by the Department of Commerce in its countervailing duty investigation underscores that such an argument would remain subject to legal uncertainty, with several ambiguous terms that would necessitate interpretation and could thus be harnessed by petitioners in a judicial challenge. The same legal uncertainty also shrouds the current approach to preventing leakage under the EU ETS: as the determination by the Department of Commerce has shown, even free allocation in its current form – extended to all producers on the leakage list, not only exporters – is at risk of being found a countervailable subsidy. So far, however, the EU has considered this a risk worth taking to both avoid leakage and secure political support for the EU ETS.

4.2 Financial compensation

Instead of free allocation of emission permits, installations in sectors at risk of carbon leakage could receive direct financial compensation for the costs associated with emissions from the production of exported goods. Such a financial compensation mechanism would operate in a manner similar to free allocation, but instead of obtaining free allowances, exporters would be awarded a direct transfer of funds to cover the cost associated with purchasing allowances for emissions associated with exported goods. At least two of the civil society proposals introduced during the political debate on the CBAM envisioned financial compensation as the – or one of the – approaches to preventing export-related leakage.[66]

This approach does not require handing out emission allowances. Hence, it would also function in a setting in which very few allowances are available – a

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64 Matthew Genasci, *Border Tax Adjustments and Emissions Trading: The Implications of International Trade Law for Policy Design*, 2 CCLR 31 (2008), doi: 10.21552/CCLR/2008/1/30.

65 Kateryna Holzer, *Carbon-Related Border Adjustment and WTO Law* (2014), doi: 10.4337/9781782549994.

66 Jouanjean et al., *supra* n. 32. A second proposal, drafted by a multinational law firm on behalf of a large emitter covered by the EU ETS, was never made public, but is on file with the authors.

highly likely scenario in a net-zero economy, in which further allowances can only be issued to the degree that they are balanced with negative emissions from carbon dioxide removal activities. Like free allocation of allowances, however, the remission of costs associated with EU ETS compliance for exports would need to navigate the inherent tradeoff between effectively addressing carbon leakage and diluting the carbon price signal. Any financial compensation mechanism that levels the playing field for EU producers on global markets could provide an incentive to increase production, and therefore risks diminishing the effectiveness of the EU ETS. To counter this risk, the financial compensation could be partial, based on product benchmarks that only result in compensation of the compliance cost faced by the 10% best performers in each sector. That way, affected exporters would still face an incentive to lower the carbon intensity of production.

A further important question relates to how such compensation mechanisms would be funded. Like free allocation, they would impose a burden on public budgets, because revenue generated from the auctioning of emission allowances to exporters would be immediately spent on compensating those same exporters. Partial compensation would not only increase the decarbonization incentive, but could also help ensure a positive fiscal balance. The exact level of compensation would have to be calibrated against the increased risk of export-related leakage under a partial compensation mechanism.

As with free allocation, however, financial compensation that is contingent on export performance risks being considered a prohibited subsidy under the ASCM. Any variant of a financial compensation mechanism would fall under the definition of financial contribution in the ASCM, which includes any government practice that 'involves a direct transfer of funds (e.g., grants, loans, and equity infusion), potential direct transfers of funds, or liabilities (e.g., loan guarantees).[67] Consequently, the same legal considerations discussed in the previous section on free allocation would also apply to a financial compensation mechanism for exports.

4.3 Exemption from EU ETS compliance

Another option to level the playing field for exported products would be to exempt these altogether from emission trading. Emission allowances need to be surrendered on an annual basis, and although it has never been seriously proposed in the debate about export-related leakage, it would be possible, in principle, to waive the obligation to surrender allowances if covered emitters can demonstrate that their production has been exported. Even though such an outright exemption has not been proposed in the discussion on export-related leakage, one conceptual

[67] World Trade Organization, *supra* n. 53, Art. 1.1(a)(1)(i).

proposal would retain free allocation for both products destined for the domestic and for export markets, and instead layer an additional compliance obligation on domestically produced and imported products in the domestic market, exempting exports.[68]

A further question would relate to the treatment of goods that are used by other EU producers as intermediate inputs to produce goods that are subsequently exported, for instance steel used to produce automobiles for the world market. The logic of providing an exemption for products destined for international markets would imply that such production of raw material inputs – even though purchased and processed further within the EU – should likewise be exempt from compliance with the EU ETS. Tracking the flow of intermediate inputs through complex value chains is, however, administratively challenging and would require a dedicated monitoring and reporting system. In principle, this problem also arises for other approaches to address export-side leakage, such as free allocation or financial compensation. However, for the latter design options it would be conceivable to grant free emission allowances or financial compensation to producers or exporters relative to their output that is incorporated in other products that are exported (e.g., steel in automobiles produced for the non-EU market). By contrast, exemptions from EU ETS compliance could only be granted with a prior commitment that output will be incorporated in goods that will eventually be exported. The latter thus raises more substantial challenges than the other designs when it comes to monitoring and sanctioning non-compliance if a product is sold on the internal market instead of being exported.

More generally, exemptions for exporters would contradict the declared – and legally vested[69] – goal of EU climate policy to reduce its domestic emissions. In contrast to free allocation of emission permits or financial compensation, which do not change the emission cap in the EU ETS, exempting certain industries would in fact increase total EU emissions. To ensure that allowances freed up by a waiver for exporters do not suppress demand in the market and merely shift to other emitters covered by the EU ETS, a number of allowances equal to emissions embedded in exported goods should simultaneously be cancelled to adjust the overall cap. However, this could be expected to further increase scarcity of allowances and thus the compliance costs for producers in the domestic EU market. It would be difficult to argue that EU producers should face a rapidly declining emissions cap

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[68] This proposal, drafted by a multinational law firm, was never made public, but is on file with the authors.

[69] European Parliament and Council, *Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 Establishing the Framework for Achieving Climate Neutrality and Amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')* 1 (2021), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021R1119 (accessed 15 Mar. 2024).

when they produce for the internal market, but be allowed to use more emissive production methods when they produce for the world market. A selective exemption for exported goods would also risk violating obligations under the ASCM, as outlined in the previous subsections. In sum, granting exemption from the EU ETS for exporters would indeed curtail an undesired effect of carbon pricing – the potential for carbon leakage – but at the same time reduce its desired effect of incentivizing emissions reductions. Consequently, exempting exporters from the EU ETS can be considered one of the least effective options to deal with export-related carbon leakage.

4.4 Consumption charges

As described above, free allocation of emission allowances based on output reduces the potential for carbon leakage, but also weakens the effectiveness of the carbon price. One way to counter the undesired effect of incentivizing the production of a higher quantity of carbon-intensive goods through free allocation consists in imposing a simultaneous tax or levy on the consumption of carbon-intensive materials, such as steel, aluminium, chemicals, etc. A consumption charge was debated on the EU level and considered as one of the implementation options in the CBAM inception impact assessment,[70] but was then abandoned before publication of the 'Fit for 55' package of legislative and policy proposals.[71]

In its pure form, a consumption charge would apply to the consumption of each unit of the respective material, regardless of where and how it has been produced. Such a pure consumption charge would provide an incentive to produce and consume less of the covered products, but would not reward cleaner production, since it applies equally across carbon-intensive materials irrespective of how they were produced. Applied thus, a consumption charge would act as a complement to – and not replace – the carbon price resulting from the EU ETS.

A consumption charge would be relatively easy to implement. Since it is levied on consumption rather than production, it would not discriminate between domestic and foreign products or producers. A consumption charge would only apply to domestic consumption, moreover, and would not hence affect exports of EU producers, avoiding negative impacts on their competitiveness and minimizing export-related leakage.[72] Because the consumption

[70] European Commission, *supra* n. 27.

[71] *See* European Commission, *Delivering the European Green Deal*, (2021), https://ec.europa.eu/clima/eu-action/european-green-deal/delivering-european-green-deal_en (accessed 15 Mar. 2024).

[72] Hector Pollitt, Karsten Neuhoff & Xinru Lin, *The Impact of Implementing a Consumption Charge on Carbon-Intensive Materials in Europe*, 20 Climate Pol'y S74 (2020), doi: 10.1080/14693062.2019.1605969.

charge would qualify as an indirect tax applied to products, exports could be exempted without incurring challenges under the ASCM.[73]

The general drawback of this approach is that it does not account for the carbon content of the actual goods it applies to. That is, EU emitters would still require some form of compensation for the higher production costs relative to foreign producers who are subject to laxer climate regulation, such as free allocation of emission allowances or direct financial compensation, incurring the fiscal concerns and incompatibility with a rapidly declining pathway towards net zero emissions already mentioned earlier. If the CBAM is introduced alongside such a consumption charge with continued free allocation, moreover, the EU would need to justify why it still awards free allowances to EU producers.

Individual Member States could in principle adopt consumption charges at the national level. Such a unilateral consumption charge would apply to all covered goods consumed in the implementing Member State, including goods that were produced in Member States that have not adopted consumption charges of their own. In order to avoid discrimination of producers from other Member States and to ensure that this approach does not distort the EU internal market, the respective producers would also need to receive free emission allowances or financial compensation, incurring institutional complexity. Another concern is that producers would incur additional transaction costs to monitor and report the trade flows within EU Member States that have adopted different types of consumption charges.

4.5 Innovation support

Technological innovation can lower the costs of emission abatement. Hence, supporting innovation in mitigation technologies is an indirect way to lower EU producers' mitigation costs.[74] Many provisions to advance research, development, and deployment of new technologies (such as support mechanisms for renewable energy sources) affect a broad set of industries and are hence also relevant for addressing import- as well as export-related carbon leakage. They are distinct from financial compensation described above in that they do not remit all or part of the cost accruing to producers from complying with the EU ETS, but instead seek to incentivize the development and deployment of abatement technologies by lowering their cost or reducing the financial risk of related investments. Because the

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[73] Roland Ismer et al., *Supporting the Transition to Climate-Neutral Production: An Evaluation Under the Agreement on Subsidies and Countervailing Measures*, 26 J. Int'l Econ. L. 216 (2023), doi: 10.1093/jiel/jgac058.

[74] Adam B. Jaffe, Richard G. Newell & Robert N. Stavins, *A Tale of Two Market Failures: Technology and Environmental Policy*, 54 Ecological Econ. 164 (2005), doi: 10.1016/j.ecolecon.2004.12.027.

CBAM addresses import-related leakage only, innovation support that promotes the transformation of export-intensive sectors that are covered by the CBAM would be desirable. Such a support mechanism could take on two basic forms.

One way to provide targeted innovation support for exporters could be to target the carbon content of production, for instance by dividing a predetermined financial contribution between the 10% cleanest exporters in a specific sector. A similar approach to implementing innovation support could consist in awarding subsidies for specific production technologies, and making the award contingent on goods exports. Such approaches in which support is directly coupled to export performance would, however, likely be considered a prohibited export subsidy under the ASCM. It bears noting that the dramatic increase in subsidies for mitigation technologies under economic recovery and stimulus packages launched during the COVID-19 pandemic, and more recently under various industrial policy initiatives in the US, has prompted a broader political debate about the need to coordinate subsidy practices and relax trade disciplines constraining environmental subsidies. While the EU has already taken initial steps in this regard by declaring certain categories of state aid for the decarbonization of industrial production processes compatible with the internal market,[75] it can only loosen subsidy constraints set out in its domestic legal framework. At the international level, related discussions have only begun, for instance under the auspices of the Group of Seven (G7) negotiations on a climate club,[76] and have not yet resulted in any formal amendments to international treaty obligations, such as those contained in the ASCM.

To lower the likelihood of innovation support measures violating WTO provisions, they could be broadly targeted at sectors which are prone to export-related leakage, without however distinguishing between goods that are produced for the domestic market or for exports. To avoid a determination that innovation support is specific to an enterprise or industry or group of enterprises or industries, its award should be determined by objective criteria or conditions that govern the eligibility for and amount of innovation support.[77] As highlighted in our empirical assessment (*see* section 2.1 above), the iron and steel

[75] European Commission, *Communication from the Commission: Temporary Crisis and Transition Framework for State Aid Measures to Support the Economy Following the Aggression against Ukraine by Russia, C(2023) 1711 Final* (2023), https://competition-policy.ec.europa.eu/state-aid/ukraine_en (accessed 15 Mar. 2024); European Commission, *Proposal for a Regulation of the European Parliament and of the Council on Establishing a Framework of Measures for Strengthening Europe's Net-Zero Technology Products Manufacturing Ecosystem (Net Zero Industry Act), COM(2023) 161 Final* (2023), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023PC0161 (accessed 15 Mar. 2024).

[76] G7, *G7 Statement on Climate Club* (2022), https://www.g7germany.de/resource/blob/974430/2057926/2a7cd9f10213a481924492942dd660a1/2022-06-28-g7-climate-club-data.pdf (accessed 15 Mar. 2024).

[77] Compare, World Trade Organization, *supra* n. 53, Art. 2.1(b).

sector can be expected to play a crucial role in this regard. Hence, measures adopted to foster the decarbonization of iron and steel production would not only help accelerate the transformation in the EU, but would also reduce carbon leakage on the export side.

A broad set of instruments could be used to this end. For instance, Carbon Contracts for Differences (CCfDs) could guarantee producers that adopt novel technologies, such as renewable or low-carbon hydrogen, a minimum carbon price that would render investments in the technology profitable; if the actual carbon price prevailing in the EU ETS – that is, the price of allowances revealed in the primary and secondary carbon market – falls below that agreed 'strike price', the difference would be covered with public funds.[78] Such a broad approach has the advantage of relatively straightforward implementation, and would not be contingent on export performance, reducing the likelihood of a violation of the ASCM. The EU Innovation Fund, which was established in 2019 and is envisaged to become a major source of funding for low-carbon technologies, could supply the required financial resources.

5 DISCUSSION AND CONCLUSIONS

Export-related leakage could threaten to undermine the environmental benefits and political acceptability of the CBAM as a policy instrument to counteract emissions leakage. This risk is not distributed evenly, however: averaged across all products covered by the CBAM, the risk of export-related leakage may appear manageable.[79] Yet as the analysis in section 2 showed, for certain sectors – especially iron and steel – as well as certain Member States, impacts of export-related leakage could be much more pronounced. For an economy highly dependent on exports, this is a risk that should not be ignored.

Several proposals have been introduced in the political debate to address this challenge. The solution included in the final CBAM Regulation merely calls for a periodic evaluation of export-related leakage, and defers the consideration of viable policy options. Section 4 identified the main options available, and also discussed their respective environmental, economic, and legal implications. From this analysis, it is clear that any option made contingent on export performance – whether in the form of continued free allocation of emission allowances, financial compensation, or

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[78] Oliver Sartor & Chris Bataille, *Decarbonising Basic Materials in Europe: How Carbon Contracts-for-Difference Could Help Bring Breakthrough Technologies to Market* (2019), https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Etude/201910-ST0619-CCfDs_0.pdf (accessed 15 Mar. 2024).

[79] Recall, however, that the European Commission estimated a 6.8% loss of market share for EU exports from a CBAM design that only covers imports, *see* European Commission, *supra* n. 16, at 65–66.

outright exemption from compliance obligations under the EU ETS – faces a heightened risk of violating international trade law. These options also have unfavourable fiscal implications and risk creating perverse incentives to shift production towards more carbon-intensive exports, although the latter risk can be limited by providing only partial allocation, remission, or exemption, for instance on the basis of product benchmarks.

Another option, consumption charges, avoids the legal risks that accompany the foregoing options, and can provide a direct incentive to lower the consumption of covered goods. Still, it does not supplant the need for a carbon constraint on production, such as the EU ETS, and does not address the leakage risk under that carbon constraint. It would also entail a substantial shift in the regulatory and institutional framework for industrial decarbonization, which casts doubt on the political feasibility after all the political capital already invested in passing the CBAM. Of all the options under examination, innovation support for industrial decarbonization appears to be the most promising approach to counteract export-related leakage. Such support can reduce the immediate cost of industrial decarbonization projects by bridging the cost differential to conventional production and lowering investment risk, and over time will help drive down the cost of mitigation technologies available to both domestic and foreign producers, thereby helping level the competitive playing field.

Different instruments and channels can be leveraged to provide innovation support, such as CCfDs, and these can also be deployed in combination with the other options identified above. To minimize the risk of being qualified a prohibited export subsidy, innovation support can focus on sectors with a high share of CBAM-covered exports, without however being tied to actual export performance. Still, because innovation support entails a direct transfer of funds in the form of grants, loans, or equity infusions that benefit their recipients, it will most likely be considered a subsidy. As such, it will invite scrutiny as to whether it is being used to support specific industries and confers an unfair advantage over foreign competitors, adversely affecting the interests of trade partners. To lower the likelihood of being found an actionable subsidy, the eligibility for and level of innovation support should be made conditional on objective criteria or conditions.

Still, even then, any solution to export-related leakage – including innovation support – will inevitably be associated with the recent rise in subsidies for industrial decarbonization on both sides of the Atlantic, and the potential fallout of a subsidy race with protectionist and industrial policy objectives. Triggered by the unprecedented scale of public investment in mitigation technologies

under the US Inflation Reduction Act (IRA)[80] and Infrastructure Investment and Jobs Act (IIJA),[81] this recent trend gives rise to broader questions about the use of subsidies as an instrument of climate policy, the need for international coordination, and the continued adequacy of existing subsidy disciplines under domestic and international law. Recognizing the importance of enhanced public support for industrial decarbonization, for instance, the European Commission has outlined a Green Deal Industrial Plan,[82] temporarily relaxed state aid rules,[83] and issued a legislative proposal for a Net Zero Industry Act.[84] With these measures, the EU is temporarily affording Member States greater flexibility in the provision of support measures for the transition towards a net-zero industry.

Member States' support measures to address export-related leakage would thus likely withstand legal challenge under EU state aid rules. It is less clear, however, whether national or EU action on exports would fare similarly under international trade law, and notably under the subsidy disciplines of the ASCM. Despite calls for enhanced coordination on environmental subsidies, the current political economy of international trade cooperation is unlikely to allow for formal renegotiation of treaty provisions, for instance to reactivate the category of non-actionable subsidies that allow granting assistance to promote adaptation to new environmental requirements.[85] More viable would be the adoption of a peace clause between like-minded countries, such as members of the G7 within the context of the climate club, committing each other to abstain from challenging subsidies adopted to advance specified objectives such as industrial decarbonization.[86] While limited in geographic scope, such initiatives could meaningfully reduce the risk of judicial challenges against measures to address export-related leakage.

Ultimately, international trade rules may cede importance as a perceived barrier to necessary action against climate change: even if – or precisely because – de

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80 117th Congress, *To Provide for Reconciliation Pursuant to Title II of S. Con. Res. 14* 1818 (2022), https://www.govinfo.gov/content/pkg/PLAW-117publ169/pdf/PLAW-117publ169.pdf (accessed 15 Mar. 2024).

81 117th Congress, *An Act to Authorize Funds for Federal-Aid Highways, Highway Safety Programs, and Transit Programs, and for Other Purposes* 429 (2021), https://www.govinfo.gov/content/pkg/PLAW-117publ58/pdf/PLAW-117publ58.pdf (accessed 15 Mar. 2024).

82 European Commission, *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: A Green Deal Industrial Plan for the Net-Zero Age, COM(2023) 62 Final* (2023), https://commission.europa.eu/system/files/2023-02/COM_2023_62_2_EN_ACT_A%20Green%20Deal%20Industrial%20Plan%20for%20the%20Net-Zero%20Age.pdf (accessed 15 Mar. 2024).

83 European Commission, *supra* n. 75.

84 European Commission, *supra* n. 82.

85 World Trade Organization, *supra* n. 53, Art. 8. This provision has lapsed pursuant to Art. 31.

86 James Bacchus, *The Case for a WTO Climate Waiver* (2017), http://www.jstor.org/stable/resrep17314 (accessed 15 Mar. 2024).

jure renegotiation of trade agreements is not an option in the current political environment, a de facto process of recalibration of priorities is already taking place, fundamentally changing the weight afforded to the rules-based international trading order in the face of an overriding climate crisis.