SCOPING PAPER

BORDER CARBON ADJUSTMENTS

The case for a cooperative, principles-based approach

CHASE

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EXECUTIVE SUMMARY

Recent policy efforts in the European Union (EU) to implement a Carbon Border Adjustment Mechanism for a select number of products have increased the focus on border carbon adjustments (BCAs), moving them from theory to practice.

THE EU is exploring a carbon charge on some imported goods to address imbalances in carbon costs between the carbon price levied on EU producers and a lack of carbon pricing in exporting countries. The EU is not alone, with the Canadian government releasing an issues paper on BCAs in August 2021 as part of a broader initiative to consult on BCAs. In the U.S., the Biden administration has made no secret that they are also interested in investigating the application of BCAs. With Canada, the United States, and the European Union now all considering their design choices for border carbon adjustment mechanisms, BCAs are about to get real.

One important aspect in the design of BCAs is the level of cooperation among governments. Some level of cooperation would seem advisable to improve design, increase the understanding of programs among trading partners, smooth the protectionist waters, and, importantly, incent other countries to increase their ambition to avoid the border adjustment.

The Canadian Institute for Climate Choices, with the support of the German Embassy in Canada, explores in this paper the technical and administrative aspects of a cooperative agenda that could support the implementation of border carbon adjustments. We explore two important areas of potential cooperation, including:

- **1. UNDERSTANDING THE CARBON POLICIES** that the BCA credits for equivalent policy.
- 2. ASSESSING EQUIVALENCY AMONG SYSTEMS, including developing a legal, fair, and practical approach to assessing the relative policy stringency among traded commodities.

Important elements of the cooperative agenda for countries to pursue include the following actions:

- **1. FURTHER ENGAGE** to bring BCAs into more widespread discussions under the WTO.
- 2. BRING BCA DISCUSSIONS into multilateral alliances and cooperative forums and broaden sectoral deals.
- START COOPERATIVE WORKING GROUPS focused on best practices.
- 4. PREPARE THE INFORMATION to reveal the average costs of carbon pricing programs.



COOPERATING ON UNCOOPERATIVE BORDER CARBON ADJUSTMENTS

With many jurisdictions implementing carbon pricing and imposing carbon costs on their highly traded and emissions-intensive industries, there is increasing interest in policy levers that afford increased protection when carbon costs are misaligned across trading partners. Border carbon adjustments (BCAs) have long been investigated as one way to redress misaligned carbon prices at the border.

The motivation for BCAs is that different jurisdictions are taking varied approaches to carbon pricing, with different levels of stringency and different emitters and types of emissions covered. This creates production cost imbalances between exporting and importing firms, creating competitive issues by unfairly disadvantaging manufacturers with high carbon pricing costs relative to those with no or low carbon costs. The primary objective of a BCA is to ensure that production and hence emissions don't migrate to jurisdictions with lower carbon costs.

Recent policy efforts in the European Union to implement a carbon border adjustment mechanism for a select number of products have increased the focus on BCAs, moving them from theory to practice. The EU is not alone, with the Canadian government releasing an issues paper on BCAs in August 2021 as part of a broader initiative to consult on BCAs. In the U.S., the Biden administration has made no secret that they are also interested in investigating the application of BCAs. With Canada, the United States, and the European Union now all considering their design choices for border carbon adjustment mechanisms, BCAs are about to get real.

Wading into the BCA literature reveals a "choose your own policy adventure" with many policy choices to be made, from measurement of embodied carbon in traded goods, calculation of border charges, national exemptions, and sectoral scope of coverage. There are many details to sort out, including,

• Scope of application, including the emissions, sectors, and products to be included.

- Rate setting on imports (charges) and perhaps contentiously on exports (rebates) and how differentiated products get treated.
- Assessing equivalency among existing carbon pricing systems, including developing a legal, fair, and practical approach to assessing the relative policy stringency among traded commodities.
- International frameworks, and how BCAs are aligned with trade agreements from a compliance and dispute resolution perspective and climate agreements from an ambition and cooperative action perspective.
- Governance framework, including not only an open and transparent process of developing and implementing the BCAs but also mechanisms to enable foreign producers or their governments to appeal decisions related to their treatment under BCAs (Cosbey et al., 2021). Revenue use is an important issue.

Regardless of BCA design, the administrative burden on regulatory agencies can't be underestimated (Felbermayr & Peterson, 2017). Properly designed, the BCA must balance risks, costs and benefits, and competitiveness, keeping in view legal vulnerability, administrative difficulty, and environmental performance. Even then, no design choices can avoid all the legal uncertainty and technical complexities that are inevitable with BCAs (Mehling et al., 2017).

One important aspect in the design of BCAs is the level of cooperation among governments. After all, the objective of BCAs is to level the playing field to avoid emissions leakage, which requires a common yardstick to evaluate the equivalency of the carbon cost on competing products and fairly assign the border carbon adjustment. There is also the very real threat that BCAs will be used as trade protectionist cover and so work against the BCA's primary objective of avoiding emissions leakage by reducing misaligned carbon costs and addressing competitiveness imbalances. After all, unilateral action is frowned upon at the WTO, which was built on multilateralism. Some level of cooperation would seem advisable to improve design, increase the understanding of programs among trading partners, smooth the protectionist waters, and, importantly, incent other countries to increase their ambition to avoid the border adjustment.

The Canadian Institute for Climate Choices, with the support of the German Embassy in Canada, explores in this note the technical and administrative aspects of a cooperative agenda that could help smooth the waters for well-functioning border carbon adjustments.

THE CASE FOR A COOPERATIVE AGENDA ON BCAs

Central to the successful implementation of BCAs is a certain level of cooperation and alignment across potential BCA mechanisms. Under the Paris Agreement, states are encouraged to choose their level of GHG reduction ambition and how they design and implement policy to reduce emissions. It is this choice that gives rise to the desire to implement BCAs, where uneven policy stringency between countries leads to competitive risks due to misaligned carbon costs between competitors. By design, border carbon adjustments are motivated to close the carbon cost gap between competing global producers due to uncooperative and misaligned efforts across jurisdictions to apply carbon costs.

Developing unilateral climate policy may also extend to BCA development. Indeed, it's plausible to envision a

scenario where a country goes it alone on BCA design, providing no opportunity for other countries or importers to participate in developing best practices, share information to reveal relative policy stringency, or provide mechanisms for appeal. Another scenario involves the formation of "climate clubs," where, for example, a group of countries agree to establish a common price on emissions and common levies on goods imported from jurisdictions outside the club.

However, there is an emerging political appetite for a third scenario: major economies striking deals on a sector-by-sector basis to collaborate on carbon policy and push for more ambition. While the EU and U.S. managed to agree on agreeing about steel and aluminum trade and a link to decarbonisation, it is still very unclear how these sectoral strategies will be implemented and if they will withstand changing political winds.

Such cooperative action on BCA development can offer many benefits that going it alone does not. Harmonized approaches to BCAs could minimize the potential adverse impacts that would emerge under a patchwork of BCA systems, including:

Smoothing the protectionist waters by coordinating best

practices. Given the rise in trade protectionism since the Trump era, and a general neurosis towards China and India, the risk BCAs would be used for trade protectionism certainly seems likely. As carbon cost are levied at the border, countries would need to find ways to engage their national counterparts to reduce the strain on the overall economic relationship. Opportunities to work toward agreement on BCA principles and best practice could help, including calculating embodied emissions, setting benchmarks, and avoiding double protection caused by overcharging on the BCA relative to domestic carbon costs. To the extent that best practices are developed cooperatively, there is less likelihood that carbon costs will be misaligned and that trade disputes will emerge.

Creating policy alignment and learning by working cooperatively. There are also design and learning opportunities. Prior to the implementation of the Western Climate Initiative, a club of subnational jurisdictions spent five years working together across thematic working groups on competitiveness, cap setting, offsetting, and several other design elements. When it came time to implement the Western Climate Initiative in California and Quebec, the participating jurisdictions were aligned on core design choices. Importantly, through the process they also gained an understanding of the policy, emissions, and economic context of participating jurisdictions.

Maintaining competitiveness by ensuring equivalent costs. Cooperation affords an opportunity to share information on technical aspects of the carbon policies, including how the domestic policy impacts producer costs. Such information sharing ultimately can improve opportunities to ensure fairness and maintain equality of competitive opportunities. As carbon prices and ambition increase in many countries — for example allowances under the EU Emissions Trading System (ETS) topped 90 Euros in late 2021, and Canada is set to increase its national carbon prices to CDN \$170 by 2030 — avoiding double-charging producers has competitiveness benefits. In contrast, when the relative costs and stringency across producers are not understood, doubling up on these type of carbon costs can result in significant disadvantages in markets and lead to operational risks for producers.

- Increasing administrative efficiency. Developing harmonized frameworks will ensure more efficient processes and reduce paperwork for the governments and businesses involved. A cooperative approach to BCA implementation can also provide large emitters with technical support and consultation, preparing them for the entry into force of a BCA.
- Motivating other countries to increase their ambition and develop their own policy. This benefit is driven by each country's desire to implement their own policy and not be subject to the whims of another country's BCAs. The root of this motivation includes maintaining control over the revenue from carbon pricing, providing the flexibility for industry to choose

its own compliance pathways, and setting average costs to address competitiveness. Indeed, this incentive has played out in Canada, where provinces and territories have mostly chosen to implement their own programs instead of outsourcing policy to the Federal Carbon Pricing Backstop. By extension, the application of BCAs might catalyze countries with lagging carbon policy to increase their ambition so that they could both avoid the charge and also maintain control over the design of their own carbon pricing system. The more important the export market with BCAs, the greater this motivation to align domestic policy. But the devil is in the details, and there are incentives for countries to design domestic carbon pricing such that they avoid the charge and apply a light touch on domestic producers.

Creating political space for countries to increase their own climate policy ambition. Leveling charges at the border demonstrates to voters and industry that their government is making efforts to protect domestic economic and labour interests through applying charges at the border. This then creates political space to increase ambition—for example, by removing free allocations. Removing these allocations would then increase the average cost of the domestic policy, sending long-term investment signals that emissions-intensive activities will provide lower returns on investment.



A PRINCIPLES-BASED APPROACH 3 TO COOPERATIVE ACTION

There are a range of important principles that should guide BCA development (Cosbey, 2021; Cosbey et al., 2012; Mehling et al., 2017), some of which have greater implications for the cooperative agenda. The following four are most relevant:

Demonstrate that the objective of the BCA is avoiding carbon leakage. Misaligned carbon costs lead production (and hence emissions) to shift to countries with less stringent carbon policy. The result is a drop in domestic production and a loss in economic activity, but not necessarily a decrease in global emissions. BCAs should be designed to address this risk. To do this, policy makers must have a sound understanding of the relative carbon costs across products that are subject to the BCA. There is an administrative trade-off here, where more detailed information on relative emission intensities and carbon costs embodied in products is difficult to calculate, and therefore requires a bigger investment of time and resources. But to the extent that proxies are used that don't represent the actual carbon costs paid by the exporter, the risk increases that the BCA does not address leakage. Good BCA design therefore requires information to assess leakage risk and fairly align costs across foreign and domestic producers.

Know what domestic producers are paying and will pay so that adjustments are reasonable. The border adjustment should ensure there is just one price applied on importers, so that the BCA does not exacerbate cost differences between competitors. Any charge on foreign goods must first account for the protection granted to domestic producers, reflecting adjustments that drive a wedge between the carbon price, or marginal cost, and the producer's average unit cost. Average unit costs are calculated as the actual compliance costs paid over the level of production Compliance costs paid are a function of the carbon price and the emissions intensity subject to compliance. This emissions intensity represents a fraction of the country's total emissions, considering the free allocations or benchmarks used in intensity-based trading systems, such as Canada's Output-Based Pricing System (OBPS).

Countries need to do this homework on a cooperative basis so that informed decisions can be made about relative policy stringency.

Engage with other countries to develop a shared understanding of equivalence on average costs. BCAs should grant credit for the average carbon costs levied by carbon pricing programs in foreign jurisdictions. If policy makers choose to include other regulatory costs, such as vehicle or methane standards, in those average carbon costs, the complexity of establishing policy boundaries and estimating average costs rises fast. Regardless of the technical or legal implications, any cooperative effort to understand equivalency across systems must address the relevant stringency of policies on average costs. Establishing the level of domestic protection afforded under the carbon pricing scheme, as well as credit for equivalence of foreign carbon pricing programs, will require detailed information and sharing knowledge about carbon pricing systems. Baking such adjustments into carbon pricing systems will address competitiveness concerns. It can also further a cooperative agenda focused on understanding producers' average unit costs, rather than simply comparing carbon prices. Regardless of design choices, average unit costs are required to evaluate equivalency across systems.

While the theory of BCAs focuses squarely on redressing relative average cost differences under carbon pricing systems, the U.S. push to develop BCAs for non-price policies such as regulations or tax credits may change the calculus on just what relative carbon costs are being redressed. The arbitrary translation of regulatory measures into average costs for BCA purposes would likely run afoul of a few WTO rules, including national treatment rules and Most Favoured Nation rules.

Develop cooperative governance approaches. The principles of good governance should dictate the design and operation of the system. This requires an open and transparent development process that includes consultation, as well as opportunities for industry or their governments to provide information to help establish equivalence and inform the basis for crediting to reduce the level of the border adjustment applied. Good governance also requires allowing challenges to the default values for embedded emissions in foreign goods and ensuring transparency on the assumption about emission intensity, covered emissions, and average carbon costs embodied in the product. Applying reporting standards on GHG measurement, such as ISO 14065, would make verification easier across products. Phase-out provisions or sunsetting is needed to the extent that climate ambition and policy stringency increasingly converge across trading partners (Cosbey et al., 2012; Mehling et al., 2017).

TECHNICAL AREAS 4 FOR COOPERATION

Implementing a cooperative BCA will require collaboration and information sharing between countries on several administrative issues, including product classifications and GHG quantification methods. We explore two important areas of potential cooperation:

- Understanding the carbon policies that the BCA credits for equivalent policy. For example, this includes emissions trading, carbon taxes, and large emitter hybrid schemes that pair a performance standard with a carbon price. These systems are opaque and highly technical, and it requires real effort to disentangle the average costs.
- Assessing equivalency between systems, including developing a legal, fair, and practical approach to assessing the relative policy stringency between traded commodities.

Central to this is knowing the relative emissions intensities and the scope of emissions, sectors, and product classifications covered.

Each is discussed below.

4.1 ACCOMMODATING A RANGE OF CARBON POLICIES

At its core, BCAs seek to address misaligned carbon costs. In theory, therefore, countries can implement very different carbon pricing schemes, which could then be boiled down to simple measures of the relative average costs of the policy on a per unit of production basis. Differences in the program design of different countries, including the scope of emissions covered, the level of the carbon price, and the compliance obligation reflecting free allocations or intensity benchmarks, could all be accommodated if the average unit cost of the policy is known.

Practically this means that in the Canada, EU, and U.S. context, very different policies will all need to be stripped down to average unit costs and then relative determinations on average costs across like products evaluated. Adjustments to credit for domestic policy could then be made under BCA schemes, such as

the EU Carbon Border Adjustment Mechanism (CBAM). In this section, we take a brief look at the three very different approaches to carbon policy in these three jurisdictions.

The EU is moving quickly on BCAs. EU ETS free allocations are scheduled to be phased out, thereby raising average unit costs closer to the carbon price. The European Commission proposed in July 2021 to implement a Carbon Border Adjustment Mechanism (CBAM) to "prevent the risk of carbon leakage and support the EU's increased ambition on climate mitigation, while ensuring WTO compatibility." Starting in 2023, the reporting requirements of the CBAM would initially apply to imports of cement, iron and steel, aluminum, fertilizers, and electricity, with an intention to apply pricing starting in 2026. The carbon adjustment applied to imported goods as proposed will mirror the weekly auction price of the EU ETS allowances.

The presence of free allocations in the EU ETS creates a wedge between the marginal carbon price and the average unit cost on products. This wedge would also be impacted by the emissions covered in the EU ETS, which vary by product. Over a 10-year period, free allocation to industry is set to decline as carbon tariffs rise, with free allocations ultimately eliminated from the EU ETS. According to the CBAM proposal, free allocation will decline at 10% per year. The CBAM covers the difference between the carbon cost covered under free allocation and the full carbon cost. This would mean that the average carbon adjustment would be expected to rise over the next 10 years as a function of both allowance prices and the transition to fully priced emissions.

In 2021, the EU entered into a bilateral agreement with the U.S. on two of the most important emissions-intensive and trade-exposed (EITE) sectors: steel and aluminum. The joint EU-U.S. statement on a Global Arrangement on Sustainable Steel and Aluminum puts an end to tariffs on EU goods introduced by President Trump and to the corresponding EU tariffs on selected U.S.-imported goods, such as motorcycles and bourbon.² It's an agreement that limits market access for high-GHG-intensity steel that is "compatible with international obligations and the multilateral rules, including potential rules to be jointly developed in the coming years, each participant in the arrangements would undertake the following actions: ... (ii) restrict market access for non-participants that do not meet standards for low-carbon intensity."³

The agreement also creates a technical working group charged with "sharing relevant data and developing a common methodology for assessing the embedded emissions of traded steel and aluminium."⁴ The agreement invites other countries to join, thus setting up the potential for multilateral cooperation.

2 https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661

¹ https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661

³ https://ustr.gov/sites/default/files/files/Statements/US-EU%20Joint%20Deal%20Statement.pdf

⁴ https://ustr.gov/about-us/policy-offices/press-office/press-releases/2021/october/joint-us-eu-statement-trade-steel-and-aluminum

The U.S. view to use implicit carbon costs absent carbon pricing raises some messy implications for BCAs. In July of 2021, Democrat Senator Chris Coons and Representative Scott Peters introduced a proposal to establish a BCA for the importation of certain goods.⁵ If adopted, it would apply a carbon fee, starting in 2024, to imports of petroleum, natural gas, and coal, as well as other carbon-intensive products such as aluminum, steel, iron, and cement.⁶

In contrast to the EU and Canada, the U.S. will most likely not have a carbon price covering its large industrial emitters. The current U.S. political landscape makes it almost impossible to move forward with a national carbon price.⁷ Not surprisingly, President Biden's Build Back Better framework does not include a carbon pricing scheme. Instead, it proposes industry-specific emissions standards, investments to promote best-in-class technologies in industry, along with large subsidies to electric vehicle purchases, and a Clean Electricity Standard that mandates renewable electricity targets.⁸

Absent a carbon price, the U.S. proposal to establish the basis of equivalency under a BCA is to use an implicit carbon cost estimated by the Secretary of the Treasury, in coordination with other departments. According to the proposal, the environmental cost incurred for each domestic sector should be determined "based on the average cost incurred by companies within such sector to comply with any Federal, State, regional, or local law, regulation, policy or program," such as the Clean Air Act, greenhouse gas emissions standards for passenger cars and light trucks, and any cap-and-trade system.⁹ It's also important to note that this proposal does not credit foreign producers for the price equivalent of the standards they bear in the country of export (or for explicit carbon prices for that matter). Finally, there is unclear political support for the proposal.

Observers have pointed out that implementing a BCA based on the implicit carbon costs faced by industry from a myriad of climate policies would be technically very difficult. Importantly, border adjustments that adjust for regulatory costs may well have no precedent in the history of international trade policy and would likely be illegal under the WTO.¹⁰

Still, if the U.S. creates a BCA mechanism for its implicit carbon prices, all other countries will do the same. Canada, for example, has many costly regulatory and spending policies beyond carbon taxes. Should these be included somehow in a BCA? In theory no, but if the U.S. does it (or tries it), practice may be very different.

Although a proposed BCA was initially scheduled to be included in the October 2021 U.S. budget, the White House recently withheld its support for the

⁵ https://www.coons.senate.gov/imo/media/doc/GAI21718.pdf

⁶ https://www.wiley.law/alert-Democrats-Introduce-Carbon-Border-Adjustment-Legislation

⁷ https://rooseveltinstitute.org/wp-content/uploads/2021/06/RI_GreenSteelDeal_WorkingPaper_202106.pdf 8 https://rooseveltinstitute.org/wp-content/uploads/2021/06/RI_GreenSteelDeal_WorkingPaper_202106.pdf; https://www.nytimes.com/2021/03/31/business/economy/biden-infrastructure-plan.html

⁹ https://www.coons.senate.gov/imo/media/doc/GAI21718.pdf

¹⁰ https://www.nytimes.com/2021/07/19/climate/democrats-border-carbon-tax.html

measure, raising concerns that the BCA would increase prices on consumer goods.¹¹ The U.S. is therefore not expected to move forward with a BCA in the current legislature. This makes progress impossible on carbon tariffs coming from the U.S., although developments are expected — not through an all-encompassing BCA, but rather through bilateral agreements such as the EU-U.S. statement on a Global Arrangement on Sustainable Steel and Aluminum mentioned above.

Canada is consulting on BCAs and proposing consultations on increasing the stringency of its benchmarks under outputbased pricing system. In its 2020 Fall Economic Statement, the federal government announced its intention to explore how border carbon adjustments could potentially help Canada meet its climate change targets. The rationale for this is laid out in the discussion paper as follows:

> A key emerging challenge is how to address [countries'] disparities in a coordinated way, to achieve results in lowering GHG emissions while mitigating pressures on international trade without inadvertently undermining Canada's global competitiveness. One mechanism to help achieve this would be the establishment of border carbon adjustments.¹²

Canada announced consultations on BCAs in Budget 2021, also releasing a BCA discussion paper and a consultation process.¹³ This BCA paper builds on a multiyear process in which the federal government rolled out national and mandatory carbon pricing in 2019, extending the coverage of carbon pricing from 39% of national GHGs in 2016 to 79% today. This coverage encompasses virtually all energy emissions in the country through a mix of provincial and territorial programs (covering 59% of national GHGs) and federal carbon pricing (covering 21% of national GHGs). At COP26, Prime Minister Trudeau called for a broadening of carbon pricing internationally, supporting a global carbon price while emphasizing that trade measures could be part of the solution.¹⁴

The federal carbon pricing system has two components: a regulatory charge on fuels for small emitters like households and small businesses and an emission performance-based pricing system known as the Output-Based Pricing System (OBPS) for large emitters.¹⁵ Provinces and territories have the

¹¹ https://www.reuters.com/business/sustainable-business/white-house-withholds-support-democratic-carbon-border-tax-2021-08-20/

¹² https://www.canada.ca/en/department-finance/programs/consultations/2021/border-carbon-adjustments/exploring-border-carbon-adjustments-canada.html

¹³ https://www.canada.ca/en/department-finance/programs/consultations/2021/border-carbon-adjustments/ exploring-border-carbon-adjustments-canada.html

¹⁴ https://www.ctvnews.ca/politics/trudeau-takes-carbon-pricing-debate-to-the-global-stage-at-cop26-1.5648007

¹⁵ https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html

choice of opting for the federal system or developing their own system, which in this case must meet minimum national stringency standards (the federal benchmark). In December 2021, the federal government proposed a review of the benchmarks used in the OBPS systems, which effectively could raise average costs and set a standard for other provinces and territories to follow.¹⁶

Canada now finds itself in a tricky position. It will likely be fine under the EU CBAM to the extent it can show equivalence across CBAM products. But with a rising domestic carbon price and no similar movement in the U.S., competitiveness risks are amplified. Mirroring the CBAM with a Canadian BCA would undoubtedly create friction in its trade relationship with the U.S.

4.2 ASSESSING EQUIVALENCY BETWEEN SYSTEMS

To ensure fairness, one important design feature of a BCA would be a mechanism for exporting countries to demonstrate equivalence with the BCA price benchmark, which would reflect average costs in the EU ETS, for example. The overall objective would be to assess relative stringency and avoid double taxation. Setting the benchmark carbon adjustment rate from which equivalency can be evaluated is an important step for the implementing country (Falcão, 2020). Equivalency would need to focus on the relative average cost of national carbon policies, taking into account benchmarks under outputbased pricing systems and free allocations in emission trading schemes, for example. Several technical issues would need to be addressed to establish the relative average costs across programs, each of which is discussed below.

The emissions scope is material to average costs and needs to focus on compliance emissions, taking into account direct combustion (Scope 1), indirect emissions embodied in heat, hydrogen, and electricity used in production (Scope 2), and supply chain emissions (Scope 3). Scope 2 and 3 emissions become more material to average costs when economy-wide carbon pricing is present. Notably, the EU ETS covers only large emitters, whereas Canadian carbon pricing covers 80% of national emissions, which implies large emitter supply chains in Canada bear carbon costs. In cases where carbon pricing on fuel used in supply chains is imposing carbon costs, Scope 3 becomes important, especially for facilities that rely heavily on transportation services they do not own. For example, Scope 2 and 3 emissions in Alberta's large emitter program can double the compliance cost associated with Scope 1 emissions (Sawyer et al., 2021).

The EU CBAM proposal includes direct emission only but notes that indirect emissions would be reviewed in 2026 while a recent draft EU PARL rapporteur's recommendations includes indirect emissions. (European Parliament, 2021).

¹⁶ https://www.canada.ca/en/services/environment/weather/climatechange/climate-action/pricing-carbon-pollution/output-based-pricing-system.html

The carbon content of goods subject to the BCA must be

identified. Under a theoretically pure BCA system, firms would be required to reveal the carbon content of their products and provide information to be verified (Cosbey et al., 2012; Felbermayr & Peterson, 2017). The more complex a product's supply chain, the harder it is to assess the product's true carbon content, and verification would have to reach into a deep production chain to assess the content (Felbermayr & Peterson, 2017). And the cost can be prohibitive. Evidence from the so-called rules of origin (RoO) required in preferential trade agreements indicate that administrative costs can total several percentage points of the export value, and firms often prefer to pay the tariff instead of addressing the RoO requirements (Anson et al., 2005; Carrere & Cadot, 2006). Complexity just creates more points of negotiation and informational needs, which then can bog down the process and add costs.

Given how high the administrative costs are likely to be, care must be taken in designing BCAs, with a triage (or step-by-step) approach perhaps necessary to identify those goods where a high risk of leakage justifies higher administrative costs and administrative complexity (Felbermayr & Peterson, 2017). Since blanket measures are not appropriate, a product-by-product approach is required (to be transparent and manageable at the border). Ideally, the emissions content of imports needs to be accounted for based on transparent, reliable, and up-to-date information, ideally using product specific benchmarks to estimate average costs embodied in the imports. If this information is not available, default global GHG emission intensities could be used (EU, 2021).

Don't underestimate the complexity of comparing relative emissions intensity and determining average costs. Cosbey et al.

(2021) take a close look at how to compare the relative emission intensities and product benchmarks used in both the EU ETS and Canada's OBPS. Both the EU and Canada have implemented carbon pricing systems, but these systems vary in how they allocate free emissions to industry. The EU ETS sets benchmarks using average emission levels of the 10% most efficient installations to set the benchmarks, whereas the Canadian system uses average historic production levels to determine the fraction of emissions subject to compliance. These disparate approaches to addressing competitiveness risk for industry will necessarily lead to different average cost, even when there are similarities in how products are defined and, in the emissions, covered. The authors note there are at least five technical challenges involved in comparing the relative emissions intensities across systems:

Benchmarks are not always available for the same products.

The programs need to have comparable benchmarks if they are to be compared. For example, in some large emitter product categories in the chemicals and oil and gas sectors, there are no comparable benchmarks in the EU and the Canadian systems.

- Even when benchmarks cover the same product, they may not cover the same emissions. In sectors that include process and fugitive emissions, the benchmarks may or may not include these. That can lead to noticeable differences — for example in how the EU and Canadian systems benchmark the iron and steel sector.
- Even when benchmarks cover the same product, units of measurement may differ due to differences in methodologies. Differences were observed in the Canadian and EU approaches to quantifying refinery emissions benchmarks for the refining sector. Such differences may make the benchmarks not directly comparable, even for the same industrial process and product.
- Benchmarks are disaggregated down to subproduct levels that may not align with the other jurisdiction. Differences across the pulp and paper sector were observed in both systems based on the different type of production processes, all which may not overlap.
- Benchmarks are not set at the same level of stringency. This is perhaps one of the largest areas of divergence, and not just when comparing the EU and the Canadian systems. Within Canada there was a large deviation in the level of the benchmarks applied across the subnational large emitter programs, resulting in very different average costs within sectors and across jurisdictions. This would be important area to assess when establishing equivalency.

The average cost per unit of production forms the basis of establishing BCA crediting equivalency. Where it varies significantly across products and between programs, the implications for establishing equivalency across the national programs are clear. Serious effort is required to sort this all out if the level of crediting applied is to be fair and based on actual average carbon costs of the programs.

With the United States proposing to use implicit carbon price costs, or those not stemming directly from carbon pricing programs, calculating the average cost for crediting purposes becomes even more complex. Both the European Union and Canada also have a multitude of complementary policies, for example in the electricity sector. The question of just where to draw the policy boundary around average costs is a very real and important, complicating any equivalency discussion. This process of understanding relative stringency for crediting purposes would get very messy indeed.

The tendency, then, would be to defer to pre-determined emission intensities that are applied across all imported products. However, in jurisdictions like Canada, where carbon pricing and complementary policies are genuinely adding costs to production, such a universally applied crediting approach contravenes one of the core principles of BCAs — that of not double charging exporters — and WTO and tax law.

5 COOPERATIVE ACTION ITEMS

There are cooperative actions to be pursued at the political level and within multilateral and bilateral forums. But there are also important tasks for countries to undertake in parallel with that engagement.

At the political level and through international forums, the most important actions are as follows:

Further engage to bring BCAs into more widespread discussions under the WTO. The priorities here could include help catalyze work on BCAs to articulate the issue within the WTO, push to engage with WTO members to increase understanding, and complement and support existing WTO bodies working on the issue (Cosbey, 2021). Canada and the EU are already engaging at the WTO on BCAs. Notably, in structured WTO discussions both countries raised the idea that BCAs become a sub-topic under the overarching topic of trade-related aspects of climate change mitigation and adaptation. There is also a need to seek agreement on interpretations of trade law under the Comprehensive Economic and Trade Agreement (CETA) that govern the elaboration and implementation of BCAs (Cosbey et al., 2021). Still, agreement has not been reached on a path forward within the WTO, with some countries arguing that BCAs are best left to discussions under UN bodies such as the UN Framework Convention on Climate Change (Cosbey, 2021). But pushing for engagement across WTO members is needed, given the trade implications of BCAs and the potential role the WTO will play as the referee of trade disputes involving BCAs.

 Bring BCA discussions into multilateral alliances and cooperative forums and broaden sectoral deals (climate clubs). Trade negotiations have historically proven to be much more effective when conducted bilaterally or in smaller groups, such as the G7. Before considering bringing matters to international forums, countries interested in cooperative action on BCAs could engage each other first. There are several carbon alliances and forums that provide opportunities for cooperative action on BCAs, including the Carbon Pricing Leadership Coalition. International organizations such as the IMF, the OECD, or the World Bank could also provide secretariat functions to bring together governments to tackle border carbon adjustments. For example, the IMF proposal for an international carbon price floor notes that such a global price floor could circumvent the pressure to apply BCAs.

Start cooperative working groups focused on best practices. The experience of the Western Climate Initiative — a cap-and-trade carbon market that includes California and Quebec — provides a workable approach to developing best practices. Several technical working groups were struck, and these working groups then parsed out the main design choices that needed to be made and developed a common view of design recommendations. This approach had the benefit of providing learning opportunities for the member jurisdictions

A priority no-regrets action item would be to negotiate agreement to use a common accounting system for embedded carbon in goods.

Meanwhile, countries should get going on understanding their own average costs and how these compare with trading partners:

Determining the average costs that carbon pricing imposes on domestic producers. Key information to be developed includes the main elements of how average costs are determined, including the emissions covered, the level of the benchmarks or free allocations, and the emissions intensities. Attempting to compare domestic average costs against average costs in major carbon pricing systems would also shed light on the degree of conformance between sectors and products. Such effort would also facilitate learning and help countries prepare to engage in cooperation around BCAs.

As a side benefit, consulting with domestic industry around BCAs could afford an opportunity to share information and better refine data, creating a better understanding of the competitiveness risks of greater climate ambition. Such information would better prepare regulators and industry to understand the competitiveness implications of adding more carbon costs through foreign BCAs or of phasing out free allocations or increasing benchmark stringency under intensity-based credit trading systems such as Canada's OBPS.

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