DESIGNING EFFECTIVE BORDER CARBON ADJUSTMENT MECHANISMS: ALIGNING THE GLOBAL TRADE AND CLIMATE CHANGE REGIMES

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Policy work in both the United States and the European Union is underway on how best to structure border carbon adjustment ("BCA") mechanisms to protect the competitiveness of domestic industries while these enterprises make investments in reducing their greenhouse gas ("GHG") emissions. Often, these investments are costly for domestic industries, and may therefore result in lost sales in a global marketplace where companies in other jurisdictions face no parallel obligation to address climate change and thus can bring products to the market at lower cost. Such shifts in sales and production not only cause economic harm and potential job losses in nations with high levels of commitment to climate change action but also result in carbon leakage—meaning that emissions are not ultimately reduced but rather shifted to nations with more limited GHG emissions control requirements. But while the United States and the EU share an ambition to use BCA mechanisms, they have embraced different approaches to BCA design and implementation. The European Commission has determined that the adjustment methodology should credit only explicit GHG pricing tools, including carbon taxes and GHG emission allowance trading schemes, in determining which exporting countries would escape BCA tariffs. On the other hand, the U.S. government believes that border adjustments should be based on a broader climate change policy calculus, which would consider a wider set of policies that reduce GHG emissions. In this Article, we develop a taxonomy of approaches to comparing policies in importing and exporting countries and identify the two options that are most feasible from a technical and political perspective—we call these two options explicit BCA mechanisms and effective BCA mechanisms. We then further analyze the strengths and weaknesses of these two approaches. In particular, we compare explicit versus effective BCA mechanisms on the basis of their environmental effectiveness, administrative efficiency, compatibility with World Trade Organization ("WTO") law, and political viability. We conclude that BCA mechanisms that compare

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effective GHG prices promise better environmental outcomes and are more likely to be found compatible with WTO law than BCA mechanisms that exclusively compare explicit GHG prices. In addition, we argue that, while implementing BCA mechanisms that compare effective carbon prices creates some additional administrative challenges, many jurisdictions have trade policy pricing experience that could be harnessed to address these potential obstacles.

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INTRODUCTION

Global consensus at the 21st Conference of the Parties ("COP") resulted in the 2015 Paris Agreement on Climate Change, which embraced a bottom-up policy approach to addressing the buildup of greenhouse gases ("GHGs") in the atmosphere. Under this approach, countries determine their own action plans and thus define their own nationally determined contributions ("NDCs") to the global response to climate change.[1] This policy approach encourages broad participation from developing *and* developed economies in the global climate change regime, but it also means that jurisdictions vary widely in their level of GHG emissions control ambition.[2] This structure can reduce the competitiveness of domestic industries in

1. Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 13, 2015, in Rep. of the Conference of the Parties on the Twenty-First Session, U.N. Doc. FCCC/CP/2015/10/Add.1, Article 4(2) (2016) [hereinafter Paris Agreement].

2. Paris Agreement, *supra* note 1, Art. 4(4).

jurisdictions that commit to stringent (and costly) GHG mitigation strategies—and creates a risk that high-GHG-emissions production processes will simply move to low-standard nations, thus resulting in *carbon leakage*,[3] i.e., an increase in GHG emissions elsewhere that negates the stringent climate change requirements of the high-standard nations.

To prevent carbon leakage and protect domestic industries, policymakers in a number of jurisdictions are currently considering implementing border carbon adjustment ("BCA") mechanisms. These instruments are designed to assess the embedded GHG emissions of imported products and—in the event that GHG controls in the exporting nation do not match the rigor of comparable controls in the importing country—impose a special tariff on the imported products.[4] The price applied to the GHG emissions embedded in these products would be a function of the *difference* between the climate change policy stringency in the two jurisdictions. The European Commission has developed a detailed Carbon Border Adjustment Mechanism ("CBAM"),[5] and lawmakers in the United States have proposed similar measures.[6] The two proposals, however, reflect very different positions on key aspects of BCA mechanisms' design. In the European Commission proposal, the relative stringency of the climate change policies implemented in the European Union ("EU") and abroad is established by reference to a narrow set of GHG emissions pricing policies: i.e., carbon taxes and GHG emission allowance trading systems. The U.S. proposal focuses instead on a broader suite of climate change policies that go beyond explicit carbon pricing—translating into a BCA mechanism

3. We use the terms "carbon" and "greenhouse gas" (or "GHG") interchangeably in this Article, as the term "carbon" is often used as shorthand for "carbon dioxide," which is the most prevalent GHG. But, to be clear, climate change mitigation requires control of all GHG emissions, and the use of the term "carbon" here should be understood to encompass all GHGs.

4. BCAs can also be imposed on exports, but we focus on import BCAs because export BCAs are seen as a less appealing policy tool. For instance, their ability to reduce leakage is contested. *See* Aaron Cosbey et al., *Developing Guidance for Implementing Border Carbon Adjustments: Lessons, Cautions, and Research Needs from the Literature*, 13 REV. ENV'T ECON. & POL'Y 3, 18 (2019).

5. Article 9.1 of the Commission Proposal reads as follows: "An authorized declarant may claim in its CBAM declaration a reduction in the number of CBAM certificates to be surrendered in order for the carbon price paid in the country of origin for the declared embedded emissions to be taken into account." According to Article 3.23 of the Commission Proposal, the term "carbon price" refers to "the monetary amount paid in a third country in the form of a tax or emission allowances trading scheme under a greenhouse gas emissions allowance trading system, calculated on greenhouse gases covered by such a measure and released during the production of goods." Proposal for a Regulation Establishing a Carbon Border Adjustment Mechanism, COM (21) 564 final [hereinafter EU CBAM Proposed Regulation].

6. FAIR Transition and Competition Act of 2021, H.R. 4534, 117th Cong. § 9904 (2021) [hereinafter FAIR Transition and Competition Act].

that would credit a broader set of regulatory requirements that discourage GHG emissions (and raise production costs).[7]

In this Article, we analyze the relative strengths of these different approaches to crediting climate change policies in exporting countries. In particular, we develop a taxonomy of approaches to credit policies implemented abroad that includes: (1) no crediting for any GHG emissions controls; (2) crediting only *explicit* carbon prices (i.e., costs that can be traced to carbon taxes and GHG emissions allowances trading systems); (3) crediting for *effective* carbon prices (i.e., the sum of explicit carbon prices and carbon prices applied implicitly, such as prices applied by imposing fuel taxes);[8] and (4) crediting for an even broader set of climate change policy actions including those that do not have any implicit or explicit price effect. Ultimately, we argue that crediting for explicit or effective carbon prices is the most viable option among these four approaches. With this framework in mind, we analyze more closely the relative strengths of these two approaches in terms of their environmental effectiveness, administrative feasibility, political viability and capacity to improve international cooperation on climate change, and compatibility with World Trade Organization ("WTO") law.

The core claim of this Article is that BCA mechanisms that credit *effective* GHG prices will yield better environmental outcomes, offer better prospects for gaining broad political support, and are more likely to be compatible with WTO law than narrowly constructed BCA mechanisms that exclusively credit explicit carbon prices. Furthermore, although BCA mechanisms that focus on effective GHG prices pose additional administrative challenges, many jurisdictions have a wealth of trade policy experience with countervailing duties on subsidies that could be deployed to ensure fair and appropriate BCA calculations.

Although scholars have long discussed BCA designs that are environmentally effective and compatible with WTO law,[9] academic attention has

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7. FAIR Transition and Competition Act, *supra* note 6. The view that BCA mechanisms should focus on a broad set of measures has also been supported by the U.S. Secretary of the Treasury Janet Yellen. *See* Janet L. Yellen, U.S. Sec'y of the Treasury, Remarks at the G20 Finance Ministers and Central Bank Governors Meeting's High Level Symposium on International Tax (July 9, 2021), *available at* https://home.treasury.gov/news/press-releases/jy0266 [https://perma.cc/G278-YKYS] [hereinafter Yellen Remarks]. The OECD Secretary-General Mathias Cormann has been reported as supporting a similar view. *See* Kevin Pinner, *OECD Starting New Inclusive Framework On Carbon Pricing*, Law360, (February 16, 2022), *available at* https://www.law360.com/tax-authority/articles/1465628/oecd-starting-new-inclusive-framework-on-carbon-pricing [https://perma.cc/PR5D-RH38].

8. On effective carbon prices and how to estimate them, see, for example, Goran Dominioni, *Pricing Carbon Effectively: A Pathway for Higher Climate Change Ambition*, 22 CLIMATE POL'Y 897 (2022).

9. *See, e.g.*, Javier de Cendra, *Can Emissions Trading Schemes Be Coupled with Border Tax Adjustments? An Analysis Vis-à-vis WTO Law*, 15 REV. EURO. COMM. & INT'L ENV'T L. 131 (2006); Cosbey et al., *supra* note 4; Carol McAusland & Nouri Najjar, *The WTO Consistency of Carbon Footprint Taxes*, 46 GEO. J. INT'L 765 (2015); Charles E. McLure, Jr., *The GATT-Legality of Border Adjustments for Carbon Taxes and the Cost of Emissions*

only recently focused on the possibility of making adjustments between or among trade partners based on *effective* carbon prices.[10] Building on this important but under-conceptualized idea, this Article contributes to the research on the design of BCA mechanisms and better aligns the trade regime with global commitment to climate change action and the 2021 Glasgow Climate Pact's call for *deep decarbonization* by 2050.

Finally, this Article contributes to scholarship on the compatibility of BCA mechanisms with WTO law. Legal scholarship tends to discuss BCA mechanisms as unilateral measures subject to scrutiny under the Global Agreement on Tariffs and Trade (GATT). In this Article, we challenge this view. In light of the 2015 Paris Agreement, we argue that BCA mechanisms that are designed to allow for greater ambition in climate change policy should be seen as acts of "multilateral-unilateralism."[11] Policies of this type should be subject to lighter WTO scrutiny because the GHG pricing instruments being implemented have been condoned (at least tacitly) by the WTO members, all of whom signed on to the 2015 Paris Agreement and the 2021 Glasgow Climate Pact. To ensure that the policy frameworks particular nations have developed in furtherance of their climate change commitments are as WTO-consistent as possible, a review mechanism could be created under the auspices of the WTO—perhaps in conjunction with the United Nations Framework Convention on Climate Change (UNFCCC)—to assess whether the policy instruments being used: (1) serve to advance implementation of the 2015 Paris Agreement and (2) do not impose disproportionate burdens on trade in comparison to the environmental gains achieved. A finding of alignment with the Paris goals and proportionality would bar further WTO scrutiny of the policy in question.

This Article is structured as follows: Part I introduces the concept of BCA mechanisms and their policy role. Part II develops a typology of *design options* spelling out how a BCA might credit the climate change policies of trade partners and discusses why reference to either explicit or effective carbon prices are the most viable policy options. Part III argues that BCA mechanisms that focus on effective GHG prices will deliver better environmental outcomes than those that only take account of explicit GHG pricing. Part IV argues that BCA mechanisms that consider effective GHG prices can support international cooperation on climate change better than BCA mechanisms that focus exclusively on explicit carbon prices. Part V discusses the existing trade policy structures that countries could build upon to implement BCA calculations based on effective carbon prices. Part VI argues that BCA mechanisms should be seen as acts of multilateral-unilateralism—and not narrowly unilateral measures which are disfavored in trade law. This Part also

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Permits: A Riddle, Wrapped in a Mystery, Inside an Enigma, 11 FLA. TAX REV. 221 (2011); Michael A. Mehling, Harro van Asselt, Kasturi Das, Susanne Droege & Cleo Verkuijl, *Designing Border Carbon Adjustments for Enhanced Climate Action*, 113 AM. J. INT'L L. 433, 436 (2019); Joel P. Trachtman, *WTO Law Constraints on Border Tax Adjustment and Tax Credit Mechanisms to Reduce the Competitive Effects of Carbon Taxes*, 70 NAT'L TAX J. 469 (2017).

10. *See, e.g.*, Mehling et al., *supra* note 9, at 477–78.

11. DANIEL C. ESTY, GREENING THE GATT: TRADE, ENVIRONMENT, AND THE FUTURE 139–141 (1994) (explaining the concept of multilateral unilateralism).

analyzes the compatibility of BCA mechanisms with WTO law and argues that effective BCA calculations are more likely to comply with the General Agreement on Tariffs and Trade (GATT) than explicit BCA mechanisms.

I. BORDER CARBON ADJUSTMENT MECHANISMS EXPLAINED

In its simplest form, a BCA mechanism imposes a special tariff or charge on imports from countries that have implemented less ambitious climate change policies than the importing country.[12] Ideally, the tariff level is established based on the difference between the stringency of policies (and thus production cost differentials) in the importing and the exporting country.[13]

BCA mechanisms aim to protect the competitiveness of producers in high-standard nations and to prevent carbon leakage, i.e., the prospect that stringent climate change policies will cause high-GHG-emissions products to be produced in low-standard jurisdictions and then imported into high-standard locales. This shift in production defeats the intent of strict GHG controls by simply transferring the emissions abroad rather than reducing emissions.[14] And given that GHG emissions anywhere cause climate change everywhere, the shift in production results in no net gain in terms of GHG emissions control.[15]

As discussed by Cosbey and co-authors, carbon leakage can be the consequence of at least three different effects.[16] First, GHG mitigation policies can increase the domestic costs of production, thereby reducing the competitiveness of domestic producers, who in turn lose sales to imports from low-standard countries—resulting in a net *increase* of GHG emissions as production shifts from relatively clean jurisdictions to relatively dirty ones. Second, implementing strict GHG control policies may reduce the profitability of domestic producers of carbon-intensive goods, leading to systematically lower investment in these domestic enterprises over time—and thus lost competitiveness. Gradually, countries with more stringent climate change policies will lose production capacity as new investments flow to jurisdictions where mitigation policies are less stringent (and costly). In fact, these additional investments in laggard countries may generate additional GHG emissions that more than offset the GHG emission reductions achieved in countries with ambitious climate change policies in place. Third, mitigation policies that reduce the consumption of fossil fuels in one jurisdiction may decrease fossil fuel prices, thereby dulling the incentive for energy efficiency abroad and stimulating higher fossil fuel consumption in trading partners with weak climate change policies and relatively lower-priced fossil fuels.

A well-designed BCA mechanism can address carbon leakage by "levelling the playing field" between domestic and foreign producers for products consumed

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12. Mehling et al., *supra* note 9, at 442.

13. Cosbey et al., *supra* note 4, at 16.

14. Michael Grubb et al., *Carbon Leakage, Consumption, and Trade*, 47 ANN. REV. ENV'T & RES. 753, 755 (2022).

15. Tony Lempriere et al., *Canadian Boreal Forests and Climate Change Mitigation*, 21 ENV'T REVS. 293, 294 (2013).

16. Cosbey et al., *supra* note 4, at 5.

domestically.[17] To illustrate, imagine that imported goods are cheaper than domestically produced ones due to the lower GHG constraints implemented in the exporting country. A BCA mechanism will increase the price of imported goods as if these products were subject to the GHG controls that apply to domestic production, thereby establishing a level playing field between domestic and foreign products.

BCA strategies can also seek to induce trade partners to implement more ambitious climate change policies.[18] This incentive stems from the fact that the charge imposed on imported products is equal to the difference in the carbon constraints applied in the importing and the exporting country. Rather than having their exporters pay duties to importing nations, low-standard exporting countries have an incentive to implement more ambitious climate change policies domestically to reduce the burden of the BCA mechanism on their exporting sector. This could include energy policies that help close an energy efficiency gap, such as mandates or information disclosure policies, or subsidies to deploy green technologies. In addition, governments of exporting countries may introduce GHG charges or emissions allowance schemes to capture revenues that would otherwise accrue to the importing country, while leaving exporting companies in the same competitive position. This incentive can be particularly high in countries with a low ability to raise funds domestically through taxation—a critical aspect of development.[19]

Empirical research suggests that BCA mechanisms reduce GHG leakage. For instance, a meta-analysis of 25 studies on BCA mechanisms found that, on average, these instruments reduced carbon leakage from 14% to 6%.[20] Similarly, a recent UNCTAD study found that a BCA mechanism could reduce carbon leakage from 13.3% to 5.2% if the EU were to implement a carbon tax of $44 per ton of GHG emitted.[21]

With calls for greater ambition echoing across recent climate change negotiations, BCA mechanisms are emerging as an important tool to promote more stringent climate change policies in high-ambition jurisdictions that want to protect the competitiveness of their domestic industries. The push for greater climate change

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17. Andrei Marcu, Michael Mehling & Aaron Cosbey, *Border Carbon Adjustments in the EU: Issues and Options*, EURO. ROUNDTABLE ON CLIMATE CHANGE & SUSTAINABLE TRANSITION 3, 3 (2020), https://ercst.org/border-carbon-adjustments-in-the-eu-issues-and-options/ / [https://perma.cc/TD2C-V4UJ].

18. Joseph E. Stiglitz, *A New Agenda for Global Warming*, in ECONOMISTS' VOICE, July 2006, at 1, 2.

19. Dirk Heine & Simon Black, *Benefits Beyond Climate: Environmental Tax Reform* 14, in FISCAL POLICIES FOR DEVELOPMENT AND CLIMATE ACTION (Miria A. Pigato ed., 2019).

20. Frédéric Branger & Philippe Quirion, *Would Border Carbon Adjustments Prevent Carbon Leakage and Heavy Industry Competitiveness Losses? Insights from a Meta-Analysis of Recent Economic Studies*, 99 ECOLOGICAL ECON. 29 (2014).

21. U.N. CONF. TRADE & DEV., A EUROPEAN UNION CARBON BORDER ADJUSTMENT MECHANISM: IMPLICATIONS FOR DEVELOPING COUNTRIES 18 (2021), https://unctad.org/webflyer/european-union-carbon-border-adjustment-mechanism-implications-developing-countries [https://perma.cc/4PCG-LG3Y].

action could crumble unless policies are put in place to protect would-be climate leaders from suffering economic disadvantage at the hands of lagging nations. Simply put, if competitiveness fears are not addressed, countries that might otherwise choose to be leaders in climate change mitigation may well reduce their ambition out of fear of disadvantaging their own companies in both domestic and export markets.[22] This situation was described in a 2019 report by the World Bank as "lose-lose."[23] By leveling the playing field between producers in high- and low-standard jurisdictions, BCA mechanisms protect countries with stronger climate change policies and encourage all nations to meet their Paris Agreement and Glasgow Climate Pact commitments.

II. SELECTING OPTIONS TO CREDIT FOR POLICIES ABROAD

Jurisdictions that implement a BCA mechanism face important methodological questions in determining how to set a border tariff on imported goods. Specifically, the importing nation must decide how to assess differences between their climate change policy and those of importing nations. This process requires comparing different countries' climate change policies, which may take a variety of forms. If the importing nation has in place a GHG charge of $50/ton of CO2-equivalents[24] and a nation from which it is receiving goods has no GHG controls in place, then the border adjustment will entail a tariff equal to $50 per ton of GHG emissions calculated to be embedded in the imported goods. But this charge will be reduced if the exporting country has some measure of GHG controls in place. For example, if the exporter nation imposes a $10 per ton GHG charge, the border adjustment tariff will be reduced to $40 per ton of embedded GHGs, with the exporter being *credited* for its $10 per ton charge.[25] Where the BCA calculation becomes more complicated is when nations use a diversity of climate change policy tools—as they often do—not all of which entail explicit GHG pricing.

In this Part, we distinguish four broad approaches to BCA crediting for climate change policies implemented abroad (Section II.A). Among these four options, we identify the two approaches that we think are more easily implementable from a political perspective and that do not present insurmountable implementation challenges. Section II.B expands on these two options and the related academic debate. The remainder of the analysis presented in this Article (Parts III, IV, V, and VI) focuses on the pros and cons of these two options.

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22. ESTY, *supra* note 11, at 155–56.

23. WORLD BANK, REPORT OF THE HIGH-LEVEL COMMISSION ON CARBON PRICING AND COMPETITIVENESS 8 (2019), https://openknowledge.worldbank.org/handle/10986/32419 [https://perma.cc/UM53-M32M].

24. Carbon dioxide equivalent, or CO2-eq, is a standardized metric used to compare different GHGs based on their global warming potential.

25. WILLIAM PIZER & ERIN CAMPBELL, RES. FOR THE FUTURE, BORDER CARBON ADJUSTMENTS WITHOUT FULL (OR ANY) CARBON PRICING 6, 13 (2021), https://www.rff.org/publications/working-papers/border-carbon-adjustments-without-full-or-any-carbon-pricing/ [https://perma.cc/VU3T-B2KX].

A. Four Potential Approaches to Credit for Policies Abroad

In this Section, we distinguish four potential approaches for crediting climate change policies abroad and discuss their political and administrative feasibility.

A first approach would be to offer no border adjustment credit whatsoever for the climate change policies of the exporting nation. Some U.S. policy analysts have proposed this approach as Congress considers adopting a border carbon adjustment mechanism.[26] In their view, giving no credit for policies abroad would help make the BCA mechanism compliant with the GATT by ensuring alignment with the most favored nation ("MFN") principle. This principle requires that importing countries grant equal treatment to "like" imported products regardless of the country of provenance. As we explain in Part VI below, we do not find this argument convincing because we disagree with its critical assumption—that products with divergent GHG footprints are "like" products. We think instead that giving BCA credit for a range of climate change policies abroad is much more likely to be judged to be GATT-compatible.

In this respect, we also note that a significant downside of not crediting for policies abroad is that it is likely to prompt a strong diplomatic backlash from exporting countries, potentially undermining efforts to cooperate on climate action at the international level. It is not uncommon that national trade policies result in backlash from exporting countries. For example, in 2012 the EU included international aviation in its emissions allowance trading scheme, and its major trade partners retaliated. China, India, and the U.S. responded by passing legislation that prohibits their aircraft operators from complying with the EU regulation; China also blocked a $4 billion order from Airbus.[27] As a result of this backlash, the EU suspended the application of the emission allowance trading scheme to flights outside the European Economic Area. This experience demonstrates that strong political backlash can sometimes be sufficient to stop sub-global, trade-related policies, such as BCA mechanisms. Therefore, designing a BCA mechanism to avoid strong international backlash can be essential for the survival of the BCA mechanism itself.

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26. Brian Flannery, Jennifer A. Hillman, Jan Mares & Matthew C. Porterfield, Res. for the Future, Framework Proposal for a US Upstream GHG Tax with WTO-Compliant Border Adjustments: 2020 Update (2020), https://www.rff.org/publications/reports/framework-proposal-us-upstream-ghg-tax-wto-compliant-border-adjustments-2020-update/ [https://perma.cc/AJ66-FXA8]. For a discussion of how to estimate export rebates and import charges based on available data, see Brian Flannery & Jan Mares, Res. For the Future, Export Rebates and Import Charges for Border Tax Adjustments Under an Upstream US GHG Tax: Estimates and Methods (2021), https://www.rff.org/publications/working-papers/export-rebates-and-import-charges-for-border-tax-adjustments-under-an-upstream-us-ghg-tax-estimates-and-methods/ [https://perma.cc/6L98-4UPL].

27. Lorand Bartels, *The WTO Legality of the Application of the EU's Emission Trading System to Aviation*, 23 EUR. J. INT'L L. 429, 435 (2012); *see also* Pete Kasperowicz, *House Passes Bill Defying Europe's Aircraft Emissions Rules*, HILL (Oct. 24, 2011), https://thehill.com/blogs/floor-action/house/189459-house-passes-bill-defying-europes-aircraft-emissions-rules [https://perma.cc/2LH6-QDM4].

A second BCA strategy would only credit the exporting nation's climate change policies that explicitly put a price on GHG emissions—like carbon charges and emissions allowances trading schemes. We refer to this BCA mechanism design option as an *explicit* BCA mechanism. The EU Commission CBAM proposal takes this explicit carbon pricing approach.[28]

A third approach would credit a broader set of climate change policy instruments that impose costs on GHGs—including not just explicit carbon prices, but also implicit GHG price effects (such as taxes on fossil fuels). We refer to this BCA mechanism design option as an *effective* BCA mechanism. Under this approach, BCA credit would also be extended to instruments that increase the marginal cost of emitting GHGs even though they do not directly target the carbon content of fossil fuels or the emissions released in consuming these fuels (*implicit carbon pricing*). If the comparison of policies implemented in the exporting and importing country is extended to include implicit carbon prices, the border adjustment will take place based on the levels of *effective carbon prices* (i.e., the sum of explicit and implicit carbon prices) in the two jurisdictions.[29]

What policies might count as implicit carbon prices? Although the term *implicit carbon pricing* is often used in policy and academic circles, there is no universally accepted definition of what policies can be seen as pricing GHGs implicitly.[30] But there is a base of data and analysis on which to build. Notably, both the IMF and OECD have estimated effective GHG prices for many jurisdictions.[31] The IMF and OECD definitions include energy taxes, and the IMF also includes fossil fuel subsidies.[32] Other analysts track a broader set of policies that alter the price of fossil fuel consumption and, therefore, the price of emitting GHGs.[33] This Article regards a broad set of policies as implicit carbon pricing, including energy taxes, environmental taxes that increase the cost of fossil fuels, taxes on traffic

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28. Article 9.1 of the Commission Proposal reads as follows: "An authorized declarant may claim in its CBAM declaration a reduction in the number of CBAM certificates to be surrendered in order for the carbon price paid in the country of origin for the declared embedded emissions to be taken into account." According to Article 3.23 of the Commission Proposal the term carbon price refers to "the monetary amount paid in a third country in the form of a tax or emissions allowances under a greenhouse gas emissions trading system, calculated on greenhouse gases covered by such a measure and released during the production of goods." EU CBAM Proposed Regulation, *supra* note 5.

29. For further discussion of explicit, implicit, and effective carbon prices, see Dominioni, *supra* note 8.

30. WORLD BANK, STATE AND TRENDS OF CARBON PRICING 2019 at 69 (2019), https://openknowledge.worldbank.org/handle/10986/31755 [https://perma.cc/H6B5-ZXGY].

31. OECD, EFFECTIVE CARBON RATES: PRICING CO2 THROUGH TAXES AND EMISSIONS TRADING SYSTEMS (2018), https://www.oecd.org/tax/effective-carbon-rates-9789264260115-en.htm; IMF, FISCAL POLICIES FOR PARIS CLIMATE STRATEGIES—FROM PRINCIPLE TO PRACTICE, IMF Policy Paper No. 19/010 (2019).

32. *Id.*

33. VIVID ECON. & OVERSEAS DEV. INST., ESTIMATING EFFECTIVE CARBON PRICES: ACCOUNTING FOR FOSSIL FUEL SUBSIDIES (2019), http://www.vivideconomics.com/wp-content/uploads/2019/08/Vivid-Economics-ODI-Estimating-Effective-Carbon-Prices.pdf [https://perma.cc/4V2L-RPTB].

congestion that do not apply to cleaner vehicles,[34] excise taxes on road traffic insurance contracts that do not apply to zero-emissions vehicles,[35] tradeable performance standards, and withdrawal of subsidies for fossil fuel consumption.

Furthermore, we recognize that debate over what policies can be translated into implicit GHG pricing is likely to intensify in the wake of the 2022 Inflation Reduction Act in the United States. The Act offers $369 billion over ten years for a suite of climate change and energy security investments forecast to reduce U.S. GHG releases 37–41% by 2030 compared to the 2005 baseline.[36] How much of this total package might be credited in a BCA calculation could become a major point of trade policy contention, particularly as other requirements of the Act, including domestic procurement obligations, appear to be outright violations of GATT non-discrimination rules.[37]

U.S. Secretary of the Treasury Janet Yellen has called for a fourth approach, which we refer to as the *wide-open* approach. This is an even more flexible BCA design, whereby border tariff adjustments would credit all climate change policies that reduce GHG emissions—thus going beyond implicit as well as explicit carbon pricing.[38] This approach would credit all types of climate change mitigation policies implemented in exporting countries. A similar approach is taken in the 2022 U.S. House of Representatives proposal for a BCA mechanism—in which exemptions would apply to countries that "enforce[] laws and regulations designed to limit or reduce greenhouse gas emissions that are at least as ambitious as Federal laws and regulations designed to limit or reduce greenhouse gas emissions."[39]

We find the *wide-open* approach problematic to the extent that it requires those calculating BCA tariffs to estimate the GHG price equivalence of a very diverse set of climate change policies, some of which may not be easy to quantify.[40] We note that Resources for the Future economists have proposed principles for the design of BCA mechanisms that credit non-price-based climate change policies.[41] But as the proponents of this approach themselves recognize, crediting for non-

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34. For instance, in London, battery electric or hydrogen fuel cell vehicles are eligible for a Cleaner Vehicle Discount London Congestion Charge. *Discounts and exemptions*, TRANSPORT FOR LONDON, https://tfl.gov.uk/modes/driving/congestion-charge/discounts-and-exemptions [https://perma.cc/7N8T-PLLP].

35. Norway's road traffic insurance tax offers one such example. *See Road traffic insurance tax*, NORWEIGIAN TAX ADMINISTRATION, https://www.skatteetaten.no/en/business-and-organisation/vat-and-duties/excise-duties/about-the-excise-duties/road-traffic-insurance/.

36. Frances Colon et al., *How the Inflation Reduction Act Will Drive Global Climate Action*, Center for American Progress (Aug. 17, 2022), https://www.americanprogress.org/article/how-the-inflation-reduction-act-will-drive-global-climate-action/ [https://perma.cc/5N69-7B5N].

37. Charles Benoit, *The Inflation Reduction Act Knifes the Multilateral Trading System*, Coalition for a Prosperous America (Aug. 17, 2022), https://prosperousamerica.org/inflation-reduction-act-knifes-the-multilateral-trading-system-heres-what-ustr-needs-to-do/.

38. Yellen Remarks, *supra* note 7.

39. FAIR Transition and Competition Act, *supra* note 6.

40. Marcu et al., *supra* note 17, at 37–38; Cosbey et al., *supra* note 4, at 16.

41. Pizer and Campbell, *supra* note 25.

pricing policies presents numerous challenges. The marginal costs of non-pricing policies are not observable, exemptions may need to be applied to imported products to reflect the existence of unpriced domestic GHG emissions, and benchmarks to implement exemptions are difficult to establish.[42] These complexities make the *wide-open* option impractical because it requires taxing authorities to gather significantly more data on policies implemented in all trading partners and to estimate their marginal costs,[43] which are likely to vary across regulated companies and sectors. This complexity also creates a risk of non-transparency in the tariff rates applied (due to numerous hidden assumptions in the calculations) and thus an increased risk of dispute over the validity of the mechanism. Future methodological innovations may allow overcoming these barriers, but, for now, the wide-open approach is too problematic to be adopted.

B. Focus: Explicit and Effective BCA Mechanisms

Based on the discussion of the previous Section, the remainder of the Article focuses on two design options. We put aside the *no-credit* option as likely to be too divisive and disruptive to efforts to get countries to work together to reduce GHG emissions. We also drop the *wide-open* BCA approach as administratively difficult and politically problematic for the reasons noted above. Our analysis thus seeks to evaluate the relative merits of *explicit* BCA mechanisms (which establish a border tariff based entirely on a comparison of explicit GHG prices in the importing and exporting countries) versus an *effective* BCA mechanism (which compares explicit and implicit GHG prices in the two jurisdictions).

In the academic debate, the choice between *explicit* and *effective* BCA mechanisms has received relatively little attention. Yet, we see the distinction as critical from the perspectives of administrative ease of application, environmental effectiveness, political viability, and GATT consistency. An important exception can be found in a 2019 article by Mehling and co-authors, which suggests that where no explicit carbon price is in place in the exporting country, or where the importing country has an explicit carbon price combined with multiple complementary policies, the adjustment could be established by comparing effective carbon prices.[44] Although the authors mention the possibility of crediting for effective carbon pricing, they do not analyze the advantages and disadvantages of this design option compared to crediting only for *explicit* carbon pricing. Accordingly, we add to this research by analyzing the advantages and disadvantages of building BCA mechanisms around effective carbon prices as opposed to building BCA mechanisms around explicit carbon prices. In particular, we focus on the relative environmental benefits of these two policies, their administrative feasibility, and their likely compatibility with WTO law. The core claim of this Article is that designing BCA mechanisms based on effective carbon prices offers several advantages compared to explicit BCA mechanisms.

Moving from explicit to effective carbon pricing can fundamentally reshape our understanding of leaders and laggards in GHG mitigation policy. For

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42. *Id.*
43. Marcu et al., *supra* note 17, at 37–38.
44. Mehling et al., *supra* note 9, at 477–78.

instance, according to the OECD,[45] in 2012 the Netherlands applied an average effective carbon price of about €54 per ton of carbon to emissions in sectors other than road transport. Of the €54, only about €4 are from explicit carbon prices (related to the EU emission allowance trading scheme), and the remaining are from energy taxes (i.e., implicit carbon pricing). In comparison, South Korea has an explicit carbon price (from its emissions allowance trading system) of about €6 per ton of carbon and an implicit carbon price from other energy taxes of about €4 per ton of carbon, combining to create an effective carbon price of €10. The relative standing of each country thus depends on the type of carbon price considered. These differences are significant because they determine which countries will face BCA tariffs.

Before beginning the analysis, we must clarify the level of jurisdiction at which crediting should take place. We think BCA mechanisms could be structured initially so that exporters pay countervailing carbon duties based on the effective prices derived from national policies. But we would allow any producer subject to more stringent sub-national (provincial, regional, state, or municipal) regulations to seek a lower duty if they provide evidence that effective carbon prices in their sub-national jurisdiction are higher than the national price. This design element might induce sub-national governments to ramp up their climate change efforts, knowing that their exporters would not be competitively disadvantaged. This provision would also encourage sub-national climate change leadership—an essential type of climate change action in many jurisdictions[46]—and broader climate change policy transparency while highlighting innovative policy instruments and best practices.

III. DELIVERING CLIMATE AND OTHER ENVIRONMENTAL BENEFITS

This Part discusses the relative GHG-mitigation (and, more broadly, environmental) benefits of implementing BCA mechanisms based on *effective* versus *explicit* approaches. We propose that *effective* BCA mechanisms are likely to outperform *explicit* BCA mechanisms in terms of climate mitigation and environmental protection.

Policy instruments that impose an explicit carbon price target the embedded GHG content of goods based on the emissions released during production or the carbon content of the fuels consumed in their production. Therefore, these measures tend to be more sharply focused on GHG mitigation than instruments that only indirectly increase the price of burning fossil fuels. For instance, under an

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45. OECD, *supra* note 31.

46. Daniel C. Esty, *America's Climate Change Policy: Federalism in Action*, 1 FRENCH YEARBOOK OF PUBLIC LAW, (forthcoming 2023);
Nathan E. Hultman, Leon Clarke & John O'Neill, *Fusing Subnational with National Climate Action Is Central to Decarbonization: The Case of the United States*, NATURE COMMS. (Oct. 16, 2020), https://www.nature.com/articles/s41467-020-18903-w [https://perma.cc/8GRM-88E2] (discussing the importance of subnational climate action in the United States); Martin Jänicke & Rainer Quitzow, *Multi-Level Reinforcement in European Climate and Energy Governance: Mobilizing Economic Interests at the Sub-National Levels*, 27 ENV'T POL'Y GOV. 122 (2017) (discussing the importance of subnational climate action in the European Union).

energy tax that does not differentiate for the carbon content or GHG emitted in burning fuels, manufacturers can only reduce their tax liability if they reduce energy consumption to produce their goods.[47] In contrast, a carbon tax that targets the GHG content of the fuel or GHG emissions released in producing goods incentivizes GHG abatement via scaled-back energy consumption, reduction of the GHG intensity of the energy consumed, or investment in carbon capture and storage (CCS).[48] Under a carbon tax, for example, a company may be able to reduce its GHG charge by blending gasoline with ethanol to fuel its fleet or by adopting CCS technologies.[49] For this reason, some analysts favor policies that rely on explicit carbon prices.[50]

Why is this relevant for the design of BCA mechanisms? As discussed in Part I, one of the key incentives of BCA mechanisms to increase climate ambition abroad stems from the possibility that exporting countries will adopt policies that are credited under the mechanism and thereby capture revenues that would otherwise go to the importing country. Under an effective BCA mechanism, exporting countries increase their revenues while leaving the competitiveness of domestic industries unchanged by implementing any policy that implicitly or explicitly puts a price on GHG emissions. In contrast, under an explicit BCA mechanism, only the implementation of actual GHG pricing—i.e., the most fine-tuned instrument to mitigate climate change—allows the exporting country to collect carbon revenues. This line of reasoning may suggest that explicit BCA mechanisms are superior because they incentivize the adoption of GHG pricing in exporting countries more directly than effective BCA mechanisms.

While we recognize that explicit carbon prices provide sharper incentives to mitigate GHG emissions, we do not believe that it necessarily follows that BCA mechanisms designed around explicit carbon prices will deliver better GHG mitigation results than effective BCA mechanisms. To the contrary, there are several reasons why BCA mechanisms based on effective GHG pricing might outperform explicit BCA approaches. First, effective BCA mechanisms leave exporting countries wider latitude to determine how best to address climate change in their own political and policy context. This increased freedom may result in broader and deeper climate change action—notably in jurisdictions where the political will to adopt an explicit carbon price may not exist. In other words, crediting for effective carbon pricing provides exporting jurisdictions with broader scope to craft their climate change strategies. This flexibility is important in light of the diversity across nations in their energy, environmental, and political circumstances. Explicit GHG pricing gives countries something of an all-or-nothing choice, and some countries may decide to choose "nothing." Effective BCA mechanisms, on the other hand, will reward a broader set of policy interventions that aim to reduce GHG emissions. The wider the array of options and the greater the ability to tailor climate change

47. OECD, *supra* note 31, at 22–25.

48. *Id.*

49. On the GHG reduction benefits of blending ethanol with gasoline for light-duty vehicles, see Alexandre Milovanoff et al., *Well-To-Wheel Greenhouse Gas Implications of Mid-Level Ethanol Blend Deployment in Canada's Light-Duty Fleet*, 131 RENEWABLE SUSTAINABLE ENERGY REV. 110012 (2020).

50. Jeroen C.J.M. van der Bergh et al., *A Dual-Track Transition to Global Carbon Pricing: The Glass Is Half-Full*, 20 CLIMATE POL'Y 1057 (2020).

policies to local circumstances and political realities, the greater the number of nations that will adopt significant GHG mitigation efforts. This flexibility will also allow for innovation that might reveal climate change policy tools even more effective than explicit GHG pricing.

Second, as further discussed below, effective BCA mechanisms often increase the transparency of climate change actions undertaken in different jurisdictions. Effective BCA mechanisms allow countries to track net changes in the stringency of climate policies resulting from reforms that simultaneously raise the prices of emitting GHGs but also offer hidden rebates. This greater transparency has the potential to increase trust and spur "co-petition" (which entails a mix of cooperation and competition) between countries. We elaborate on these two arguments below.

A. Incentivizing Climate Change Policy Domestically and Abroad

As discussed in Part I, BCA mechanisms are designed in part to incentivize the importing nation's trade partners to implement more ambitious climate change policies to reduce the burden the BCA mechanism imposes on their exports. This Section argues that BCA mechanisms that credit for effective carbon prices will incentivize climate change action abroad more effectively than BCA instruments that credit exclusively for explicit carbon prices because the former gives exporting countries more freedom to implement mitigation policies that match domestic needs and address domestic political and capacity constraints. Thus, crediting for effective carbon prices will let the exporting country determine how to increase the ambition of its climate change action, potentially allowing for more ambition overall.

1. Addressing Political Constraints

Jurisdictions differ significantly in their political will and ability to implement explicit carbon prices. Many countries struggle to implement carbon charges, broader GHG taxes, or emissions allowance trading systems. Industry lobbying, special interest intervention, and campaign contributions may all create public opposition to these policies.[51] In these countries, pricing GHG implicitly may be the only viable climate change policy option. Given the political challenge of getting overt carbon pricing regimes enacted in a number of nations (including the United States), effective BCA mechanisms might lead to greater overall GHG reductions than explicit BCA mechanisms.

Public choice theory also argues for effective BCA approaches. The cost of explicit carbon prices tends to fall on a concentrated set of business interests. These interests are easy to mobilize and highly motivated to fight back. The benefits

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51. Andrea Baranzini et al., *Carbon Pricing in Climate Policy: Seven Reasons, Complementary Instruments, and Political Economy Considerations*, 8 WILEY INTERDISCIPLINARY REV.: CLIMATE CHANGE e462, at 7 (2017). On public opposition to carbon pricing, see Stefano Carattini, Steffen Kallbekken & Anton Orlov, *How to Win Public Support for a Global Carbon Tax*, Comment, NATURE (Jan. 16, 2019), https://www.nature.com/articles/d41586-019-00124-x [https://perma.cc/GH4K-HG4L]. Goran Dominioni & Dirk Heine, *Behavioural Economics and Public Support for Climate Pricing: A Revenue Recycling Scheme to Address the Political Economy of Carbon Taxation*, 10 EUR. J. RISK REG. 554 (2019); BARRY RABE, CAN WE PRICE CARBON? (2018).

of explicit carbon pricing, by contrast, are diffuse throughout the planet and across generations, so the beneficiaries are hard to organize. Business opposition to explicit carbon pricing may therefore be both significant and successful—especially from GHG intensive sectors. These sectors may bear more significant losses than consumers and other industries because carbon pricing more sharply reduces the value of their fixed assets.[52] There is compelling evidence that businesses often mobilize opposition and lobby against explicit carbon pricing.[53] For example, energy-intensive sectors in the United States mobilized opposition to the Waxman–Markey "cap and trade" bill, which would have introduced a nationwide GHG emission allowance trading system in the United States.[54] Similar dynamics have likewise influenced policy action on carbon pricing in other jurisdictions. For instance, after nine years of political struggle, South Africa implemented a carbon tax in 2019 that was far less ambitious than earlier proposals.[55] South Africa's GHG tax rose annually not by 10% as initially drafted, but rather by 2% plus inflation until 2022.[56] Business resistance to reform likely played a substantial role in this delay and reduction of policy ambition.[57]

Like businesses in carbon-intensive sectors, the public often opposes the implementation of explicit carbon prices. Several explanations shed light on this opposition. For instance, large segments of the public may fear that an explicit carbon price would impose burdensome costs on their households or negatively impact the economy by hampering the competitiveness of domestic industries.[58] In recent years, several proposed explicit carbon pricing schemes have been defeated by public vote, either directly via referendum or indirectly via the election of

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52. Jesse D. Jenkins, *Political Economy Constraints on Carbon Pricing Policies: What Are the Implications for Economic Efficiency, Environmental Efficacy, and Climate Policy Design?*, 69 ENERGY POL'Y 467, 469–470 (2014).

53. MATTO MILDENBERGER, CARBON CAPTURED: HOW BUSINESS AND LABOR CONTROL CLIMATE POLITICS 238 (2020); Danielle Resnick, Finn Tarp & James Thurlow, *The Political Economy of Green Growth: Illustrations from South Africa*, 32 PUB. ADMIN. & DEV. 215 (2012).

54. Jenkins, *supra* note 52, at 470–71.

55. *See* Patrick Curran, *As South Africa's Carbon Tax Is Delayed Again What Is the Story So Far?*, LONDON SCH. OF ECON.: GRANTHAM RES. INST. ON CLIMATE CHANGE & THE ENV'T (Oct. 24, 2018), http://www.lse.ac.uk/GranthamInstitute/news/as-south-africas-carbon-tax-is-delayed-again-what-is-the-story-so-far/ [https://perma.cc/W77F-6QT2].

56. *Id.* The government of South Africa has subsequently revised upwards the tax rate of the South Africa carbon tax in 2022. Further plans were announced in 2022 to make the carbon price more stringent up to 2030. *See Carbon Pricing Dashboard*, WORLD BANK GRP., https://carbonpricingdashboard.worldbank.org/map_data [https://perma.cc/68PU-XGNP].

57. *See* Resnick et al., *supra* note 53; Lilibeth Acosta, Political Economy of Climate Change Mitigation: The Case of Carbon Taxes (Dec. 2015) (unpublished manuscript), *available at* https://www.researchgate.net/publication/342693525_Political_Economy_in_Climate_Change_Mitigation_The_Case_of_Carbon_Taxes [https://perma.cc/6DEB-M3N6].

58. Stefano Carattini, Maria Carvalho & Sam Fankhauser, *Overcoming Public Resistance to Carbon Taxes*, 9 WILEY INTERDISCIPLINARY REV.: CLIMATE CHANGE e531, at 3–4 (2018); Dominioni & Heine, *supra* note 51, at 558–60.

politicians whose electoral campaigns promised to block explicit carbon pricing action.[59] Some governments have also reduced their GHG pricing ambitions following public protests, as occurred in France after the *gilets jaunes* took to the streets.[60]

Instruments that implicitly price GHGs tend to provoke less strident political opposition because they are often seen as not related to "climate" or "carbon," and thus are less polarizing.[61] These instruments are more widely adopted worldwide than their explicit counterparts. For instance, while only 37 jurisdictions have currently implemented an explicit carbon price at the national level,[62] gasoline taxes apply in almost all countries.[63] Moreover, according to the International Institute for Sustainable Development ("IISD"), 50 countries reformed their fossil fuel subsidies between 2015 and 2018 alone.[64] One explanation for this disparity between the adoption of implicit versus explicit GHG pricing instruments lies in language. Research indicates that instruments that price GHGs implicitly without

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59. Changes in power have led to the abandonment of carbon pricing projects in various jurisdictions. For instance, when Republican Susana Martinez became governor of New Mexico in 2011, she blocked the implementation of the Western Climate Initiative in the state. *See* Barry G. Rabe, *The Durability of Carbon Cap-and-Trade Policy*, 29 GOVERNANCE 103, 111 (2016). Similarly, in 2014 the Australian Senate repealed the Australian carbon tax that had been put in place by the Labor and Green parties two years earlier. Lenore Taylor, *Australia Kills Off Carbon Tax*, GUARDIAN (July 16, 2014), https://www.theguardian.com/environment/2014/jul/17/australia-kills-off-carbon-tax [https://perma.cc/JQ3L-VUSK]. Direct referendum blocked the introduction of a carbon fee in Washington state in 2016 and 2018. Lewis Kamb, *Washington Voters Reject Initiative to Impose Carbon Tax on Fossil Fuels*, SEATTLE TIMES (Nov. 8, 2016), https://www.seattletimes.com/seattle-news/politics/carbon-emissions-tax-initiative-732/; Oliver Wilman, *Milestone Carbon Pollution Plan Rejected by Washington State Voters*, GUARDIAN (Nov. 7, 2018), https://www.theguardian.com/us-news/2018/nov/07/midterms-carbon-pollution-initiative-1631-washington-rejected [https://perma.cc/U38D-JDVU].

60. Adam Nossiter, *France Suspends Fuel Tax Increase That Spurred Violent Protests*, N.Y. TIMES (Dec. 4, 2018), https://www.nytimes.com/2018/12/04/world/europe/france-fuel-tax-yellow-vests.html/ [https://perma.cc/6QVM-SU7G].

61. Barry G. Rabe & Christopher P. Borick, *Carbon Taxation and Policy Labeling: Experience from American States and Canadian Provinces*, 29 REV. POL'Y RES. 358, 370–72 (2012); Goran Dominioni, *Motivated Reasoning and Implicit Carbon Prices: Overcoming Public Opposition to Carbon Taxes and Emissions Trading Schemes*. 13 EUR. J. RISK REGUL. 158, 169–70 (2022).

62. *Carbon Pricing Dashboard*, *supra* note 56.

63. Paasha Mahdavi, Cesar B. Martinez-Alvarez & Michael L. Ross, Ctr. for Glob. Dev., Why Do Governments Tax or Subsidize Fossil Fuels? (Aug. 2020), https://www.jstor.org/stable/pdf/resrep29812.pdf?acceptTC=true&coverpage=false&addFooter=false [https://perma.cc/MRM5-MRFA].

64. Laura Merrill & Nina Quintas, *One Step Forward, Two Steps Back: Fossil Fuel Subsidies and Reform on the Rise*, INT'L INST. FOR SUS. DEV. (May 27, 2019), https://www.iisd.org/articles/one-step-forward-two-steps-back-fossil-fuel-subsidies-and-reform-rise [https://perma.cc/RNL9-ZVM9].

referencing terms such as "climate-related" or "tax-related" face less opposition than instruments that explicitly aim to reduce climate change.[65]

Instruments that implicitly price GHGs, moreover, may better fit national needs and political circumstances. Environmental and energy policies often yield local benefits beyond climate change mitigation. Countries may prefer to implement one policy that raises the marginal cost of consuming fuels over another based on these co-benefits. For example, vehicle tolls applied per mile or kilometer driven—a policy applied in various jurisdictions around the world[66]—aim primarily to reduce network congestion and cover transportation infrastructure investments and operation costs.[67] But they have also been particularly effective at reducing driving and cutting transportation-related GHGs.[68] When such distance-based road tolls apply lower rates to cleaner vehicles,[69] they increase the marginal cost of using more GHG-intensive vehicles and thereby incentivize a shift toward cleaner vehicles, which reduce GHGs and local air pollution.[70] A jurisdiction with congestion or local air pollution challenges[71] might prefer to implement such a policy over an explicit

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65. Rabe & Borick, *supra* note 61; Andrea Baranzini & Stefano Carattini, *Effectiveness, Earmarking and Labeling: Testing the Acceptability of Carbon Taxes with Survey Data*, 19 ENV'T ECON. & POL'Y STUDIES 197 (2017).

66. For instance, various countries in the EU apply toll charges per kilometer driven on trucks. *See* Aleix Pons-Rigat, Sergi Sauri & Mateu Turro, *Matching Funding, Mobility, and Spatial Equity Objectives in a Networkwide Road Pricing Model: Case of Catalonia, Spain*, 2606 J. TRANSP. RES. BD. 1, 2 (2017). In addition, the European Parliament and Council have recently agreed on the implementation of distance-based charges on trucks, vans, and passenger cars in the EU. *See* Press Release, European Parliament, Eurovignette: Provisional Deal on New Road Haulage Charging Rules (June 16, 2021), https://www.europarl.europa.eu/news/en/press-room/20210614IPR06103/eurovignette-provisional-deal-on-new-road-haulage-charging-rules [https://perma.cc/VY4T-A8NP].

67. Pons-Rigat et al., *supra* note 66, at 2.

68. Ralph Sims et al., *Transport*, in CLIMATE CHANGE 2014: MITIGATION OF CLIMATE CHANGE: WORKING GROUP III CONTRIBUTION TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 599, 644–645 (2014).

69. The European Parliament has recently approved a reform that applies distance-based road tolls that charge lower rates to trucks and buses that emit less GHGs. *See European Parliament approved reform of road haulage charging*, EUROPEAN PARLIAMENT NEWS (Feb. 17, 2022), https://www.europarl.europa.eu/news/en/press-room/20220210IPR23020/european-parliament-approved-reform-of-road-haulage-charging [https://perma.cc/F4MD-RKVD].

70. Federico Cavallaro & Silvio Nocera, *The Potential of Road Pricing Schemes to Reduce Carbon Emissions*, 67 TRANSPORT POL'Y 85, 90 (2018).

71. Congestion costs are a significant concern in various jurisdictions. The IMF estimates congestion costs at the country level and finds that they tend to be higher in western Europe. The lowest congestion costs are found in Africa (except for South Africa). The United States, Latin America, and Australia are somewhere in between these two extremes. IAN W. H. PARRY ET AL, GETTING ENERGY PRICES RIGHT: FROM PRINCIPLE TO PRACTICE 108–09 (2014). According to the American Transportation Research Institute, traffic congestion on the U.S. National Highway System imposed a cost of about $74 billion to the trucking industry in 2016 alone. America Transportation Research Institute, 2018, Trucking Industry Congestion Costs Now Top $74 Billion Annually, https://truckingresearch.org/2018/10/18/trucking-industry-congestion-costs-now-top-74-billion-annually/

carbon price because the tolls more effectively reduce traffic congestion and air quality.[72] A BCA mechanism that credits for effective carbon prices allows such a country to act on this policy priority while mitigating GHG emissions and preserving the competitiveness of its exports. In countries where the government's policy priorities are aligned with those of the public (e.g., significant segments of the public perceive traffic congestion to be a major problem), effective BCA mechanisms might well stimulate greater climate change action than an explicit BCA mechanism.

As discussed in Part I, one of the main aims of BCA mechanisms is to induce the adoption of climate change mitigation policies both domestically and abroad. While explicit BCA mechanisms may incentivize the use of explicit carbon pricing, effective BCA mechanisms may stimulate the adoption of a much broader set of GHG control measures. Carbon taxes and emissions allowance trading systems often face stronger political resistance than instruments that price carbon implicitly and achieve other policy goals. The flexibility of effective carbon prices allows for better alignment with national policy priorities and political realities than a typical explicit carbon price. Thus, effective BCA mechanisms may be more efficacious than an explicit BCA mechanism in stimulating climate change action.

2. Addressing Capacity Constraints

Financial, technological, and administrative capacity constraints may also hinder the implementation of carbon taxes and emissions allowance trading schemes in many jurisdictions.[73] Implementation of implicit GHG pricing policies, on the other hand, tends to require less governmental capacity, especially compared to emissions allowance trading schemes. Effective BCA mechanisms may lead to more stringent climate action in countries that struggle to implement explicit carbon prices due to capacity constraints than explicit BCA mechanisms.

Explicit carbon pricing schemes can pose significant technical hurdles as they require precise monitoring of GHG emissions from regulated entities and comprehensive strategies for addressing the risk of evasion and avoidance. Some design features for carbon charges can help overcome these challenges. For example, upstream application of carbon taxes on fuels—i.e., the application of the charge at the point of fuel production or importation—can greatly reduce the number of regulated entities and the related monitoring costs, which eases the burden of enforcement.[74] However, for emissions allowance trading schemes, technical

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72. Ian Parry, Chandara Veung & Dirk Heine, *How Much Carbon Pricing Is in Countries' Own Interests? The Critical Role of Co-Benefits*, 6 CLIMATE CHANGE ECON. 1, 2–3 (2015); Sims et al., *supra* note 68, at 644–45.

73. A notable example of the challenges faced in implementing emission allowance trading schemes is the Kazakhstan ETS. The Kazakhstan ETS, launched in 2013, was temporarily suspended in 2016–2017 to address operational challenges and amend rules on the allocation of emission allowances. *See Kazakhstan-Emissions Trading System*, ICAP, https://icapcarbonaction.com/en/ets/kazakhstan-emissions-trading-system [https://perma.cc/85KN-UU9E].

74. DARRAGH CONWAY, SZYMON MIKOLAJCZYK & CHARLOTTE STRECK, PARTNERSHIP FOR MARKET READINESS, CARBON TAX GUIDE: A HANDBOOK FOR POLICY MAKERS 26 (Mar. 2017), https://openknowledge.worldbank.org/handle/10986/26300 [https://perma.cc/62GD-UETH].

challenges can remain high. An emissions allowance trading scheme requires the government to establish a monitoring, reporting, and verification ("MRV") system, as well as a market oversight body whose key functions include ensuring market transparency and avoiding market manipulation.[75] To address these technical challenges, many countries access capacity building programs[76] and establish pilot programs before implementing full-fledged carbon markets or carbon tax regimes.[77]

Limited capacity to implement explicit carbon prices, especially emissions allowance trading systems, is generally a greater challenge in developing countries. Currently, out of the 68 explicit carbon pricing schemes implemented worldwide (including regional and sub-national ones), there are only two instruments implemented or scheduled for implementation in Southeast Asia and Africa (the Indonesia carbon tax and the South Africa carbon tax).[78] To date, no emissions allowance trading scheme has been implemented in Africa, Southeast Asia, or South America.[79]

Policies that increase implicit carbon prices, such as reforms of fossil fuel subsidies, tend to pose fewer capacity constraints than explicit carbon pricing mechanisms, a factor that makes implicit carbon strategies a more tenable climate policy for many developing countries. As mentioned above, between 2015 and 2018 alone, 50 countries reformed their fossil fuel subsidies.[80] Most of the reforms that focus on reducing subsidies to fossil fuel consumption have taken place in developing countries, including middle-income countries, such as China and Mexico, and less developed economies, such as Ghana and Sudan.[81] Like fossil fuel subsidy reforms, virtually every country in the world has implemented energy taxes.[82] The diffusion of these subsidy and energy tax policies suggests that implementing implicit carbon prices is often a more feasible option than explicit carbon pricing schemes, especially for low-capacity governments.[83]

Given the capacity-based feasibility of implementing implicit carbon pricing policies, an effective BCA better accounts for differences in financial,

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75. Aki Kachi & Michel Frerk, Int'l Carbon Action Partnership, Carbon Market Oversight Primer (2013), https://icapcarbonaction.com/system/files/document/carbon_market_oversight_primer_web.pdf

76. There are various capacity-building programs offered by international organizations and national development agencies, including the Partnership for Market Readiness (PMR) and the German Development Agency ("GIZ").

77. Easwaran Narassimhan, Kelly S. Gallagher, Stefan Koester & Julio Rivera Alejo, *Carbon Pricing in Practice: A Review of Existing Emissions Trading Systems*, 18 CLIMATE POL'Y 967 (2018); Huw Slater, Dimitri de Boer, Qian Guoqiang & Wang Shu, China Carbon F., 2019 China Carbon Pricing Survey (2019), http://www.chinacarbon.info/wp-content/uploads/2019/12/2019-China-Carbon-Pricing-Survey-Report.pdf [https://perma.cc/LWU8-E88P]; WORLD BANK, *supra* note 30, at 79.

78. *Carbon Pricing Dashboard*, *supra* note 56.

79. *Id.*

80. Merrill & Quintas, *supra* note 64.

81. *Id.*

82. Mahdavi et al., *supra* note 63.

83. Dominioni, *supra* note 8, at 901.

technological, and administrative capacity between countries, leaving greater flexibility for those who are less prepared to implement explicit carbon prices. Thus, an effective BCA mechanism can stimulate greater climate change action abroad, potentially increasing worldwide GHG mitigation.

Jurisdictions vary widely in their policy choices, reflecting different economic circumstances, tax practices, regulatory traditions, and, most importantly, political realities. The optimal climate change policy in the United States will likely be different from Germany, which will be different from India. Differences may also exist at the sub-national level. Effective BCA mechanisms allow for greater differentiation in climate change policies (by ensuring the full range of policy options get credited in the BCA calculation), thereby allowing countries to tailor their policies to domestic needs and preferences. This flexibility is likely to make effective BCA mechanisms a more effective tool to spur climate change action in both importing and exporting countries, potentially leading to better environmental and climate change outcomes.

B. Creating Transparency, Trust, and Co-Opetition

The Paris Agreement's bottom-up approach to global climate policy can only function if trust exists among member countries. Climate change mitigation is a public good—and a classic example of the tragedy of the commons.[84] Countries are unlikely to unilaterally implement costly GHG mitigation policies without assurances that others are moving arm-in-arm with them toward deep decarbonization.[85] A government may try to conceal its attempt to freeride on the efforts of others to avoid reputational costs and to prevent other countries from reducing climate change action in response. Policies that increase transparency in climate change action can limit free riding by making it easier to detect. Transparency is thus an essential tool for building trust among countries as they work in parallel to scale up policy ambition.

In this Section, we argue that, compared with explicit BCA mechanisms, effective BCA mechanisms can more effectively increase trust across countries by incentivizing greater transparency on the efforts undertaken by each country to mitigate climate change. Greater transparency can also boost action on climate change by spurring virtuous co-opetition among jurisdictions.

Effective BCA mechanisms are well-suited to create trust among countries because they reduce the risk of deceitful environmental tax reforms that seek to raise apparent GHG pricing but offer hidden rebates. Since policies may be fungible, a focus on less-comprehensive *explicit* carbon pricing can lead to mischief as countries push up carbon charges while rolling back other requirements that might be captured in an *effective* carbon price. For example, in 2019, the tax rate of the

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84. Daniel C. Esty & Anthony L. I. Moffa, *Why Climate Change Collective Action Has Failed and What Needs to Be Done Within and Without the Trade Regime*, 15 J. INT'L ECON. L. 777, 777–78 (2012).

85. There are multiple options for comparing jurisdictions' climate change efforts, each with pros and cons. *See generally* Joseph E. Aldy, William A. Pizer, & Keigo Akimoto, *Comparing emissions mitigation efforts across countries*, 17 CLIMATE POL'Y 501 (2017).

Portuguese carbon tax was increased from $8 to $14 per ton of carbon,[86] but the government simultaneously implemented a drastic decrease in fuel taxes that *lowered* gasoline costs to consumers.[87] After this reform, an explicit BCA mechanism would credit a higher carbon price on imports from Portugal without accounting for the reduction in gasoline taxes. In contrast, BCA calculations based on effective carbon prices can help establish whether environmental tax reforms result in a net positive change to climate change policy overall and credit exclusively for the effective carbon price resulting from the environmental tax reform.

Effective BCAs can be a tool to incentivize the monitoring and public reporting of accurate data on the GHG pricing policies implemented in exporting countries.[88] In particular, an effective BCA mechanism can stimulate an exporting jurisdiction to establish, through monitoring and reporting, a validated estimate of their domestic implicit carbon price. Thus, a BCA mechanism structured in this way can stimulate the production of additional data on the level of effective carbon prices in exporting jurisdictions. This additional transparency on effective carbon prices in various countries is valuable by itself, but it can also contribute to increasing trust among countries on the climate change action undertaken abroad.

Besides increasing trust among countries, greater transparency on mitigation policies implemented abroad can create peer pressure to act on climate change. Scholars have long highlighted that data comparability on governments' environmental performance is a powerful instrument to spur virtuous regulatory *co-opetition* among governments.[89]

Of course, for effective carbon pricing approaches to increase trust and maintain legitimacy, estimates must be based on well-established calculation methodologies, data that is publicly available and verifiable, and a process that is transparent, fair, and open to review and challenge. International organizations such as the OECD and IMF are developing such methodologies and can provide support to countries that wish to adopt them.[90] Review processes could come from credible third-party verifiers, including private entities (such as accounting firms) or international organizations (including the OECD, IMF, World Bank, or the World Trade Organization) as well as peer reviews (as the OECD does on environmental performance and the WTO does on trade policies). G20 countries have adopted both

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86. INT'L ENERGY AGENCY, PORTUGAL 2021: ENERGY POLICY REVIEW (July 2021), https://www.iea.org/reports/portugal-2021 [https://perma.cc/5MY8-9G65]. WORLD BANK, *supra* note 30, at 21.

87. *Taxing Energy Use 2019: Country Note – Portugal*, OECD (2019), https://www.oecd.org/tax/tax-policy/taxing-energy-use-portugal.pdf [https://perma.cc/44N7-RZ22].

88. Dominioni, *supra* note 8, at 901.

89. *See, e.g.*, Daniel C. Esty & Damien Geradin, *Regulatory Co-Opetition*, 3 J. INT'L ECON. L. 235 (2000); Daniel C. Esty & Reece Rushing, *Governing by the Numbers: The Promise of Data-Driven Policymaking in the Information Age*, CTR. FOR AMER. PROGRESS (Apr. 23, 2007), https://www.americanprogress.org/article/governing-by-the-numbers-the-promise-of-data-driven-policymaking-in-the-information-age/ [https://perma.cc/XH8N-A6QT]; DANIEL C. ESTY & GERADIN DAMIEN, REGULATORY COMPETITION AND ECONOMIC INTEGRATION (2001).

90. OECD, *supra* note 31; IMF, *supra* note 31.

mechanisms—third-party verification and peer review—to pursue their efforts to phase out inefficient fossil fuel subsidies and could replicate them to develop credible estimates of effective carbon prices.[91]

In brief, crediting for effective carbon prices instead of explicit prices alone can increase the transparency of climate change efforts undertaken in different jurisdictions, potentially increasing trust and co-opetition between countries, states, and provinces.

IV. ADDRESSING POLITICAL CONSTRAINTS

In this Part, we discuss which design option—crediting effective or explicit carbon prices—is more likely to increase the political viability of a BCA mechanism at the international level. Three dimensions of political viability are particularly relevant for the implementation of BCA mechanisms: (1) avoiding retaliation from trading partners; (2) reducing the risk of disrupting existing international cooperation on climate change; and (3) supporting new sub-global cooperation on climate change action.

As we highlighted in Part II, political pressure from trading partners can kill sub-global efforts to decarbonize international trade. A high-ambition country that aims to implement a BCA mechanism needs to consider how to minimize risks of a strong backlash from exporting countries. Besides reducing the risk of a trade war (and its related economic costs), this can help ensure that the BCA mechanism survives trading partners' pressure, thereby preventing GHG leakage.

Analysts have highlighted that implementing BCA mechanisms may disrupt international cooperation on climate change.[92] Trading partners may reduce the ambition of their nationally determined contributions ("NDCs")[93] or weaken existing bilateral efforts to collaborate on climate change.[94] Minimizing these risks may require ensuring that the BCA mechanism encounters low resistance among trading partners, especially key international players in the climate arena.

The question is which carbon pricing option can best reduce these potential downsides. We believe that implementing a BCA mechanism that credits effective carbon prices is less likely to create a strong backlash from trading partners than crediting only explicit carbon prices for at least two reasons. First, the more flexible approach of crediting for effective carbon prices aligns much more closely with the spirit of the 2015 Paris Climate Accord and its emphasis on NDCs to control GHG

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91. *OECD–IEA Analysis of Fossil Fuels Support*, OECD, https://www.oecd.org/fossil-fuels/publication/ [https://perma.cc/WHE4-NLMK].

92. Mickael Jakob et al., *How Trade Policy Can Support the Climate Agenda*, 376 SCIENCE 1401, 1401–03 (2022).

93. Christoph Böhringer et al., *Potential Impacts and Challenges of Border Carbon Adjustments*, 12 NATURE CLIMATE CHANGE 22, 22–29 (2022).

94. KONRAD ADENAUER STIFTUNG, PERCEPTION OF THE PLANNED EU CARBON BORDER ADJUSTMENT MECHANISM IN ASIA PACIFIC—AN EXPERT SURVEY, 28 (2021); https://www.kas.de/documents/265079/265128/EU+Carbon+Border+Adjustment+Mechanism.pdf/fed1d5a4-4424-c450-a1b9-b7dbd3616179?version=1.1&t=1615356593906 [https://perma.cc/ZB84-Z66H].

emissions.[95] At its core, an effective BCA mechanism respects other countries' unique circumstances and sovereignty to a greater degree and better acknowledges the right of each nation to address climate change in light of its own specific circumstances. This flexibility reflects one of the cornerstones of the bottom-up approach of the 2015 Paris Agreement—an international treaty with 193 signatory countries, including all the major economies and GHG emitters (except for Iran).[96] For this reason, we think an effective BCA mechanism is less likely to receive opposition than a BCA mechanism that only credits explicit carbon prices.

Second, this flexibility might be particularly useful in reducing opposition from the United States, a key player in international climate change negotiations. The U.S. federal government has struggled to implement an explicit carbon price at the national level, and we do not see strong prospects of this changing in the near future. On the other hand, fuel and energy taxes are common in the United States[97] and have been introduced by both Democratic and Republican governments.[98] This reality indicates that implicit carbon pricing instruments are more politically viable in the United States than an explicit carbon price. The U.S. government may therefore be more amenable to BCA mechanisms implemented abroad that incentivize the adoption of higher fuel taxes rather than it would be to mechanisms exclusively tied to explicit carbon prices. Similarly, other countries that struggle to implement explicit carbon pricing instruments but are well-positioned to implement implicit carbon prices may less vigorously oppose a BCA mechanism that credits effective carbon prices instead of explicit carbon prices alone.

Let's now look at which type of BCA mechanism is best suited to support new international cooperation on climate change. In recent times, there has been increasing attention towards forming a climate club—i.e., an agreement among a group of countries with high ambitions for curbing climate change who seek to avoid carbon leakage and competitive disadvantage. These countries would trade freely among themselves but would impose countervailing duties on those outside the club whose climate action strategies are less ambitious.[99] Academics and policymakers sometimes frame this ambition in terms of reaching a target level of carbon prices

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95. *Paris Agreement – Status of Ratification*, U.N. CLIMATE CHANGE, https://unfccc.int/process/the-paris-agreement/status-of-ratification [https://perma.cc/KV3X-4VJR].

96. *Id.*

97. Barry G. Rabe & Christopher P. Borick, *Carbon Taxation and Policy Labeling: Experience from American States and Canadian Provinces*, 29 REV. OF POL'Y RES. 358, 374–82 (2012). For recent estimates of effective carbon prices in the United States, see OECD, UNITED STATES SUPPLEMENT TO EFFECTIVE CARBON RATES 2021, https://www.oecd.org/tax/tax-policy/effective-carbon-rates-united-states.pdf [https://perma.cc/6HUU-HTZB].

98. Goran Dominioni, *Motivated Reasoning and Implicit Carbon Prices: Overcoming Public Opposition to Carbon Taxes and Emissions Trading Schemes*, 13 EUR. J. RISK REGUL. 158, 169–73 (2022).

99. There is no agreement on the contours of a "climate club" in the academic literature. For a recent classification, see Robert Faulkner, Nagmeh Nasiritousi & Gunilla Reischl, *Climate Clubs: Politically Feasible and Desirable?*, 22 CLIMATE POL'Y 480 (2021).

for those in the club.[100] BCA mechanisms can complement climate clubs in at least two ways. They can help prevent carbon leakage, and the threat of carbon tariffs may incentivize other countries to join the climate club—an insight noted by Nordhaus.[101]

As many analysts have highlighted,[102] the United States' economic output, GHG production, and diplomatic leadership make its participation crucial to the success of any climate club. Aspiring carbon pricing clubs will need to look beyond explicit carbon pricing to bring the United States into the fold. Effective carbon prices may provide just the sort of flexibility needed to ensure that club membership can be open to a broad enough base of countries to achieve viability.[103]

V. ADDRESSING ADMINISTRATIVE COMPLEXITIES

One appealing reason for adopting explicit rather than effective BCA mechanisms is administrative simplicity.[104] But this Part argues that the administrative burden of effective BCA mechanisms may be overstated, at least with respect to certain types of instruments that put an implicit price on GHGs. Many countries have significant experience with calculating countervailing and anti-dumping duties, which they can use to provide a framework for calculating the border tariffs required to implement an effective BCA mechanism.[105] Where countries truly lack the administrative infrastructure to implement an effective BCA mechanism, various international organizations can step in to help developing nations calculate border tariffs until they have the ability to do so themselves.

Implementing BCA mechanisms of any sort will require a significant amount of data and processing capacity.[106] Authorities in importing countries require data on the emissions released in producing and transporting imported goods and, depending on the scope of the emissions covered, the emissions released in producing goods used as input ("scope 3 emissions").[107] Furthermore, crediting for climate change policies implemented in the exporting jurisdiction requires data on the stringency of these policies. Crediting only for explicit carbon prices is administratively simpler than analyzing and crediting a wide range of other policies.

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100. William Nordhaus, *Climate Clubs: Overcoming Free-Riding in International Climate Policy*, 105 J. AM. ECON. REV. 1339, 1370 (2015).

101. *Id.*

102. Mickael Jakob et al., *supra* note 92; Simone Tagliapietra, *2021 Can be a Climate Breakthrough, but Biden and Europe Need to Talk*, BREUGEL (Nov. 9, 2020), https://www.bruegel.org/2020/11/2021-can-be-a-climate-breakthrough-but-biden-and-europe-need-to-talk/ [https://perma.cc/GX7G-7XKN]; Dominioni, *supra* note 8.

103. Dominioni, *supra* note 8.

104. Marcu et al., *supra* note 17, at 37–38.

105. See *infra* notes 116–120 and corresponding text.

106. Sam Kortum & David Weisbach, *Border Adjustments for Carbon Emissions: Basic Concepts and Designs* 22 (Res. for Future, Discussion Paper 2016), https://media.rff.org/documents/RFF-DP-16-09.pdf [https://perma.cc/9RY7-KM65].

107. For the definition of Scope 1, 2, and 3 GHG emissions, see *Scope 3 Inventory Guidance*, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/climateleadership/scope-3-inventory-guidance [https://perma.cc/58RA-AVM4].

This broader set of climate change policies requires more data and analysis of varying types of policies across different jurisdictions.

While we recognize the relative ease of implementing BCA mechanisms based on explicit carbon prices, many governments have ample trade policy experience that could be harnessed to reduce the administrative burden of calculating effective carbon prices. Countries routinely analyze exporters' policies and quantify import duties to offset subsidies deemed to be unfair under the Agreement on Subsidies and Countervailing Measures ("SCM Agreement").[108] Countervailing duty rules allow an importing country to determine whether the exporting country has subsidized its exports by providing a financial contribution that benefited its industry and thereby harmed the industry of the importing country.[109] Exporters that subsidize their exports may have to pay a countervailing duty that offsets the trade distortion.[110]

Just as countervailing duties seek to defeat export subsidies, BCA mechanisms aim to rectify trade distortions that result from inadequate climate change policies implemented in the exporting country that *de facto* result in a subsidy to domestic production.[111] Emitting GHGs in the atmosphere imposes costs on society.[112] Some countries require domestic producers to internalize climate externalities by implementing costly climate change policies, while others fail to do so. Climate change laggards thus effectively subsidize domestic production,[113] distorting trade to the advantage of domestic producers. Similar to anti-dumping and anti-subsidy legislation, BCA mechanisms aim to remedy this distortion and create a level playing field between domestic and foreign producers. In other words, they encourage all players in the global market to internalize their climate externalities.

In practice, countervailing duties imposed on export subsidies share similarities with BCA calculations. Article 19.4 of the SCM Agreement states that "[n]o countervailing duty shall be levied on any imported product in excess of the

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108. Agreement on Subsidies and Countervailing Measures arts. 2.1, 8.1(a), Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14 [hereinafter SCM Agreement].

109. PETER VAN DEN BOSSCHE & WERNER ZDOUC, THE LAW AND POLICY OF THE WORLD TRADE ORGANIZATION: TEXT, CASES AND MATERIALS 772–73 (2017).

110. Not all subsidies allow the importing country to implement a countervailing duty under the SCM Agreement. Only prohibited and actionable subsidies allow to do so. *See Agreement on Subsidies and Countervailing Measures ("SCM Agreement")*, WORLD TRADE ORG., https://www.wto.org/english/tratop_e/scm_e/subs_e.htm [https://perma.cc/CL3E-VBJL].

111. For a proposal to use countervailing duties to address carbon leakage, see Joseph Aldy, *Addressing the Leakage and Competitiveness Risks of Climate Policy*, 3–4 (Res. for the Future, Issue Brief (21-14) (2021)) https://www.rff.org/publications/issue-briefs/addressing-the-leakage-and-competitiveness-risks-of-climate-policy/ [https://perma.cc/53TG-5RJJ].

112. These costs include, for example, harm due to sea level rising, increased frequency of droughts, or the spread of diseases. *See, e.g.*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT: GLOBAL WARMING OF 1.5° C, ipcc.ch/sr15/ (2018) [hereinafter IPCC SPECIAL REPORT]; William D. Nordhaus, *Revisiting the Social Cost of Carbon*, 114 PROC. OF THE NAT'L ACAD. OF SCI. 1518 (2017).

113. Stiglitz, *supra* note 18, at 3.

amount of the subsidy found to exist, calculated in terms of subsidization per unit of the subsidized and exported product."[114] Although Article 19.2 of the SCM Agreement states a preference that the countervailing duty be limited to the amount needed to remedy the injury to domestic industries,[115] there is a longstanding practice of equating the duty with the subsidy received by the exporters.[116] For instance, in U.S. law, 19 C.F.R. § 351.504 provides that "[i]n the case of a grant, a benefit exists in the amount of the grant." This "accounting-like" way of establishing countervailing duties resembles the type of estimate that would be conducted under a BCA mechanism, where the importing country quantifies the adjustment by multiplying the difference in the stringency of climate change policies implemented in the two jurisdictions by the amount of GHG emissions embedded in their exported products.

Countries have developed detailed methodologies to quantify subsidies. These methodologies could guide authorities in establishing effective BCA mechanisms. In the United States, § 771(5)(E) of the Tariff Act of 1930 (as amended (19 U.S.C. § 1671, et seq.)) establishes methods to calculate the benefit enjoyed by imports. These methods are complemented by more detailed regulations adopted by the Department of Commerce, with 19 CFR § 351.503 establishing some principles for estimating the benefit and 19 CFR §§ 351.504–351.520 providing more specific guidance on how to do so.

Many jurisdictions have substantial experience in analyzing in-depth policies implemented in countries from which they import products and calculating how these policies affect production costs. For example, under anti-dumping legislation, importers determine the existence of dumping by looking at whether the exporter prices its exports below the "normal value" of the product. Generally, the commodity's price in the exporting country can be a strong indicator of the product's normal value.[117] However, when the exporting country is not a market economy, the normal value can be constructed based on the "cost of production in the country of origin plus a reasonable amount for administrative, selling and general costs and for profits."[118] When production costs serve as the indicator of the normal value, the analysis may also consider the stringency of environmental policies of the exporting country in question. For example, the new EU methodology to determine dumping calls on the EU Commission to construct benchmark prices by considering "corresponding costs of production and sale in an appropriate representative country . . . where there is more than one such country, preference shall be

114. SCM Agreement, *supra* note 108, at Article 19.4.

115. *Id.* at Article 19.2.

116. Joseph Francois, *Subsidies and Countervailing Measures: Determining the Benefit of Subsidies*, in LAW AND ECONOMICS OF CONTINGENT PROTECTION IN INTERNATIONAL TRADE 103, 105–06 (2009).

117. VAN DEN BOSSCHE & ZDOUC, *supra* note 109, at 707–08.

118. Agreement on Implementation of Article VI of GATT 1994, Art. 2.2, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Article 2.2, 1868 U.N.T.S. 201 [hereinafter Anti-Dumping Agreement].

given . . . to countries with an adequate level of social *and environmental protection*."[119]

Governments of various countries frequently engage in subsidies and anti-dumping investigations. Since 2000, the United States has initiated 641 anti-dumping and countervailing duty investigations.[120] In 2019 alone, the EU initiated 16 new anti-dumping investigations, on top of the 10 it initiated in 2018.[121] Thus, jurisdictions that wish to implement BCA mechanisms already possess significant capacity to analyze and compare policies implemented in exporting countries, and this internal capacity could be harnessed to overcome difficulties in imposing effective BCA mechanisms.

In addition, international institutions[122] and private sector actors[123] can produce standard methodologies for calculating effective carbon prices. As discussed in Part II, these methodologies need not account for all policies that put a price on GHG emissions but could serve as a basis for further refinements.

Existing administrative trade infrastructure, combined with international and private-sector solutions, makes it simpler to implement effective BCA mechanisms. Once adequate estimates of effective carbon prices become available from international institutions, they could serve as default values to estimate the level of adjustment per ton of GHGs embedded in imported products. The exporting country could have the opportunity to then rebut the default by demonstrating that their level of effective carbon pricing is actually higher than assumed. This would give countries an equitable opportunity to reduce the burden of the BCA mechanism on their exports. Importing countries would analyze the stringency of the exporting countries' policies to verify their claims. Organizations such as the International Trade Centre, OECD, IMF, and World Bank could help countries that lack adequate capacity to produce and verify estimates of effective carbon prices. This strategy not only addresses the perceived capacity constraints of implementing an effective BCA mechanism but also serves the dual purpose of incentivizing climate ambition and transparency.

Certain policies that implicitly price carbon might be more challenging to credit than others. In particular, negative credits for fossil fuel subsidies would be difficult to account for. There are different methodologies to estimate these subsidies, and the data required might not always be available.[124] The first countries

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119. Regulation (EU) 2017/2321 of the European Parliament and of the Council of 12 December 2017 amending Regulation (EU) 2016/1036 on protection against dumped imports from countries not members of the European Union and Regulation (EU) 2016/1037 on protection against subsidised imports from countries not members of the European Union (hereinafter EU 2017/2321), at Article 2.

120. A database of AD/CVD orders emitted by the US International Trade Commission is available at https://www.usitc.gov/trade_remedy/documents/orders.xls[https://perma.cc/9CUG-QQ4S].

121. Thirty-Eight Annual Report from the Commission to the Council and European Parliament on the EU's Anti-Dumping, Anti-Subsidy and Safeguard Activities, COM (2020)164 final.

122. OECD, *supra* note 31.

123. VIVID ECON. & OVERSEAS DEV. INST., *supra* note 33.

124. WORLD BANK, *supra* note 30, at 79.

to implement effective BCA mechanisms may initially only credit implicit carbon pricing policies that are easier to account for and expand crediting to more policies as administrative barriers are overcome. For example, new data may become available, or a standardized approach to estimate subsidies to fossil fuel consumption could be agreed upon in relevant fora, like the global COPs.

In brief, we argue that the administrative complexity of effective BCA mechanisms need not be seen as an insurmountable hurdle to BCA calculations based on effective GHG pricing. While some data challenges exist, many jurisdictions know how to determine when exporters are unfairly supporting their producers and can estimate duties that rectify these trade distortions. This capacity could be harnessed to implement effective BCA instruments. Further support to estimate effective carbon prices could come from various international institutions and private sector actors presently working to develop methodologies to estimate effective carbon prices. Countries can use these resources to achieve the environmental benefits of pursuing an effective BCA strategy.

VI. COMPLIANCE WITH THE GATT

It is commonly held in scholarship and policy debates that BCA mechanisms are unilateral measures that can restrict trade and therefore need to comply with core General Agreement on Tariffs and Trade ("GATT") provisions on non-discrimination. We believe that this characterization of BCA mechanisms as a purely unilateral measure is incorrect in the wake of the 2015 Paris Climate Change Accord.

As of today, 193 parties to the UNFCCC have ratified the Paris Agreement,[125] showing a multilateral commitment to reinforce the global response to climate change and keep the global average temperature well below 2°C above pre-industrial levels.[126] As discussed in Part I, the implementation of a BCA mechanism helps achieve these aims. BCA mechanisms should be seen as the unilateral operationalization of a multilateral commitment—an example of "multilateral unilateralism."[127] Acts of "multilateral unilateralism" should be understood to be tacitly condoned by exporting countries that have ratified the Paris Agreement[128]—a group that includes all 164 Members of the World Trade Organization.[129] Thus, BCA mechanisms *adequately designed* to allow for Paris-

125. *Paris Agreement – Status of Ratification*, U.N. CLIMATE CHANGE, https://unfccc.int/process/the-paris-agreement/status-of-ratification (last accessed Feb. 10, 2022).

126. Paris Agreement, *supra* note 1, at Article 2.

127. ESTY, *supra* note 11, at 139–140.

128. *Id.*

129. *Members and Observers*, WTO, https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm [https://perma.cc/WR8K-E32M]; *List of Parties*, U.N. CLIMATE CHANGE, https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states?field_partys_partyto_target_id%5B511%5D=511 [https://perma.cc/M3HB-JEHH]. The only exception is Taiwan, which is a Member of the WTO but is not Party to the Paris Agreement because it is not a Member of the United Nations. Despite not being formally

aligned ambition in climate policy have arguably been approved (albeit tacitly) by WTO members.

What constitutes an *adequate design* for BCA mechanisms is debatable, and governments may differ on this point. Ideally, an *ex ante* review mechanism could determine whether a BCA mechanism aligns with the Paris Agreement before implementation. This review mechanism could operate under the auspices of the WTO—perhaps in conjunction with the UNFCCC—and a multilateral body could assess whether actions undertaken by the relevant jurisdictions qualify as "sufficiently multilateral" to bar scrutiny under the GATT.

Governance of such a body would need to be carefully structured to represent the interests of all countries and possess adequate expertise in climate change and trade alike. Rather than focus exclusively on BCA mechanisms, it could apply to all trade measures that aim to achieve the targets of the Paris Agreement. These could include, for instance, the regional implementation of climate measures that affect transport costs in the international shipping and international aviation sectors.[130]

In the absence of such review mechanisms or tacit approval, BCA mechanisms will need to comply with the fundamental non-discrimination obligations of the GATT. These provisions are Article I (most-favored-nation clause or MFN)[131] and Article III (national treatment clause).[132] Alternatively, they would need to be justifiable under Article XX of GATT.[133]

Substantial legal scholarship analyzes whether BCA mechanisms are compatible with GATT provisions and which design features are likely to increase this compatibility.[134] None has examined whether building BCA mechanisms around *effective* carbon prices affects the likelihood that the mechanism is incompatible with the GATT. To answer this question, we compare the GATT compatibility of a BCA mechanism that credits exclusively for carbon taxes and emission allowance trading schemes with one that also credits for energy taxes and environmental taxes that increase the cost of fossil fuels. As discussed in Part V,

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party to the Paris Agreement, Taiwan has pledged to reach net-zero emissions by 2050, thereby signaling that its embraces the spirit of the Paris Accord. Ben Blanchard, *Taiwan Begins to Plan for Zero Emissions by 2050*, REUTERS (Apr. 22, 2021), https://www.reuters.com/business/environment/taiwan-begins-plan-zero-emissions-by-2050-2021-04-22/ [https://perma.cc/TYW3-L4WZ]. Other jurisdictions that are party to the WTO but not the Paris Agreement are China's Special Administrative Regions of Hong Kong and Macau. *See List of Parties*, *supra*.

130. On these measures, see, for instance, Goran Dominioni, Dirk Heine & Beatriz Martinez Romera, *Regional Carbon Pricing for International Maritime Transport: Challenges and Opportunities for Global Geographical Coverage*, 12 CARBON & CLIMATE L. REV. 140 (2018).

131. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S 194 [hereinafter GATT]; General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S 187 [hereinafter Marrakesh Agreement].

132. GATT *supra* note 133 at Art. III.

133. *Id.*

134. *See supra* note 9 and accompanying text.

these taxes are the type of implicit carbon prices that could be easily accounted for in effective BCA mechanisms.[135]

Our analysis reveals that: (1) an effective BCA mechanism is more likely to comply with Article I and Article III, § 2 of GATT than an explicit BCA mechanism; and (2) a BCA mechanism that credits for effective carbon prices is more likely to be justified under Article XX of GATT. In the Sections below, we elaborate on these two points.

A. Article III, § 2 GATT

Under Article III, § 2(a) of GATT, countries may impose a charge on an imported product if that charge is equivalent to an internal tax the country already imposes on a "like" domestic product. The national treatment obligation of Article III, § 2 additionally prohibits importing countries from applying internal charges or taxes in excess of those that apply to domestic "like" products.

Legal scholars have long debated whether a BCA mechanism can comply with Article III, § 2.[136] A contentious point is whether Article III, § 2 would allow border adjustments for internal taxes on inputs consumed in the production of imported goods when these inputs are not physical components of the final product, such as energy or emissions.[137] These taxes are referred to as *taxes occultes* and encompass both GHG taxes and energy taxes; thus, they are both explicit and implicit carbon pricing instruments. The recent trajectory of WTO scholarship indicates growing support that Article III, § 2 would allow border adjustments for internal *taxes occultes*.[138] We align with the view that existing case law, as well as the text and negotiation history of the GATT and SCM Agreement Article III, § 2, do not prohibit adjustments for taxes on non-product related processes, or on production methods that do not affect the physical characteristics of exported products.[139]

The *Superfund* case, in which the European Economic Community ("EEC") and Canada challenged a tax imposed by the United States on certain products that were produced using chemical feedstocks, might be the most relevant

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135. Further research is needed on whether BCA mechanisms could be applied on other instruments such as fossil fuel subsidies.

136. *See, e.g.*, Goran Dominioni, *WTO Law Compatibility of a 'Feebate' Scheme on Imported Products*, DESIGNING FISCAL INSTRUMENTS FOR SUSTAINABLE FORESTS 214, 215 (2021); Joachim Englisch & Tatiana Falco, EU Carbon Border Adjustments for Imported Products and WTO Law (June 2021) (unpublished manuscript) (available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3863038 [https://perma.cc/BJ4B-U367]); Trachtman, *supra* note 9, at 477.

137. Englisch & Falcao, *supra* note 137, at 10868-10869; ALICE PIRLOT, ENVIRONMENTAL BORDER TAX ADJUSTMENTS AND INTERNATIONAL TRADE LAW 240 (2017); Trachtman, *supra* note 9, at 472-473.

138. Matthew C. Porterfield, *Border Adjustments for Carbon Taxes, PPMs, and the WTO*, 41 U. PA. J. INT'L L. 41 (2019); Robert Lloyd Howse, *Non-Tariff Barriers and Climate Policy: Border-Adjusted Taxes and Regulatory Measures as WTO-Compliant Climate Mitigation Strategies*, in EUROPEAN YEARBOOK OF INTERNATIONAL ECONOMIC LAW 3, 8 (2015); Englisch & Falco, *supra* note 136.

139. *See generally* Porterfield, *supra* note 138; Howse, *supra* note 138, at 8.

WTO precedent.[140] The chemical feedstocks would have been subject to a tax if they were sold in the United States. Two aspects of this case indicate that taxes on inputs not incorporated in imported products should be permitted under WTO law. First, some of the volatile chemicals used as inputs were transformed into stable substances during the production of the imported goods.[141] The reasoning of the Panel made no distinction based on whether the feedstock chemical was physically included in the imported product, suggesting that this is not necessarily a relevant factor for the imposition of the tax.[142]

Second, Canada and the ECC argued that the border adjustment was inconsistent with the GATT because the imported substances did not create pollution in the United States. The Panel did not accept this argument. As noted by Robert Howse, if an environmental tax can be imposed at the border when the pollution does *not* harm the importing country, it is reasonable to expect that an environmental tax on GHG emissions embedded in imported products—which *do* harm the importing country—should be permitted too.[143] Following the *Superfund* reasoning, a tax on the embedded carbon content of a product constitutes the type of charge permitted under Article III, § 2, of GATT.

Based on this premise, the relevant question becomes whether the BCA mechanism imposes a higher charge on imported products than is imposed on like domestic products. Let's assume that the BCA mechanism and the domestic carbon pricing mechanism (whether implicit or explicit) impose an equal price per ton of GHG emitted in producing the imported and domestic goods, respectively. Let's further assume that the exporting country does not have a carbon pricing mechanism in place, and therefore there is no policy to be credited for the adjustment at the border. In this scenario, the imported product could still be subject to a higher carbon price if it has a higher level of embedded GHG emissions. Thus, the compatibility of a BCA mechanism with Article III, § 2 relies on the finding that two otherwise "like" products are in fact not "like" if their production resulted in different degrees of GHG emissions.

Factors relevant to whether two products are "like" include whether consumers see them as such, the use of the products, the "properties, nature and quality" of the products, and the competitive relationship of the products.[144] The Appellate Body has also described the Article III likeness analysis as "a determination about the nature and extent of a competitive relationship between and among the products" that takes numerous factors, including consumer preference, into account.[145]

A few cases suggest that products with different levels of embedded GHG emissions may not be found to be "like" products. *EC–Asbestos* shows how the

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140. Panel Report, *United States - Taxes on Petroleum and Certain Imported Substances*, WTO Doc. L/6175 - 34S/136 (June 17, 1987) ¶¶ 1.1, 2.1, 2.3–2.5.

141. Porterfield, *supra* note 138, at 24.

142. *Id.*

143. Howse, *supra* note 138, at 8.

144. Working Party Report, *Border Tax Adjustments* (1970), BIDS 18S/97, ¶ 18.

145. Appellate Body Report, *Philippines – Taxes on Distilled Spirits*, ¶ 119, WTO Doc. WT/DS396/AB/R, WT/DS403/AB/R (adopted Dec. 21, 2021).

WTO Appellate Body has conducted "like product" analysis in the past.[146] In that case, the Appellate Body found that the asbestos content of otherwise-identical cement meant that the products were not "like." Imported cement that contained asbestos was not *like* domestically produced cement that contained asbestos substitutes, meaning that Article III, § 2 permitted the otherwise-similar products to be treated differently. Of course, a BCA mechanism differs to the extent that the basis for distinction is not physically incorporated into the product. Furthermore, carbon emissions, unlike asbestos, do not necessarily represent an immediate health hazard to the consumer. Although the same reasoning may not apply to products with different levels of embedded GHG emissions, the Appellate Body may have had reasons to believe that, in the eyes of consumers, asbestos products were not "like" non-asbestos products.

Canada–Feed-In Tariff Program also suggests that products with different levels of embedded GHGs may not be "like" products. In that case, the Appellate Body explained that "[w]hat constitutes a competitive relationship between products may require consideration of inputs and processes of production used to produce the product."[147] In principle, embedded emissions of an imported product might be sufficient to deem the product not "like" a competitive domestic product, and therefore subject to less favorable treatment.[148]

One of the key contested issues in this case was whether the Canada feed-in-tariff program was compatible with the SCM Agreement. A point of contention was whether financial support by the government qualified as a subsidy. To answer this question, the Appellate Body considered whether the governmental support provided a *benefit* to the recipient, defined by considering what the recipient would have received in the marketplace.[149] In *Canada–Feed-In Tariff Program* the Appellate Body held that, when establishing the existence of a benefit to recipients, the relevant market was the electricity produced with certain renewable energy, not the electricity market as a whole.[150] This finding suggests that electricity produced with renewable energy is not "like" electricity produced with fossil fuels.[151] This is

146. Panel Report, Complaint by Canada, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products* (2000) WTO Doc.WT/DS135/R, ¶ 8.126.

147. Appellate Body Report, Canada—*Measures Relating To The Feed-In Tariff Program*, ¶5.63 WT/DS412/AB/R WT/DS426/AB/R (adopted May 6, 2013), https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds426_e.htm [https://perma.cc/R8UV-JPV5] .

148. Porterfield, *supra* note 138, at 29–30; *see also* Steve Charnovitz, *Border Tax Equalization*, in THE WORLD TRADE SYSTEM: TRENDS AND CHALLENGES 40 (Jagdish N. Bhagwati, Pravin Krishna & Arvind Panagariya eds., 2017). *But see* Englisch & Falco, *supra* note 136.

149. Agreement on Subsidies and Countervailing Measures ("SCM Agreement"), WTO, https://www.wto.org/english/tratop_e/scm_e/subs_e.htm [https://perma.cc/HAV8-ZZD9].

150. Charnovitz, *supra* note 148, at 40.

151. *Id.* at 61.

because some precedent indicates that when two products are not in competition in the same market they are not "like."[152]

Recent scholarship contests this interpretation by highlighting that the decisive factor was not the source of electricity, but rather the significant public support granted to the green electricity that created demand.[153] We do not find this rebuttal convincing. If we accept the reasoning that governmental support for a product determines demand and extend the proposition to fossil fuels, there is an argument to be made that goods produced with fossil fuels are not "like" goods produced with clean energy sources. Fossil fuels are heavily subsidized in many countries through direct consumption and production subsidies, and the underpricing of environmental and traffic-related externalities. According to the IMF, subsidies to fossil fuels (including the unpriced environmental and traffic-related externalities) amounted to $5.9 trillion in 2020.[154] More conservative estimates by the International Energy Agency (IEA) show that fossil fuel subsidies were $180 billion in the same year, despite low international prices for fossil fuels in 2020.[155] It is not unreasonable to argue that the demand for products with higher embedded GHG emissions is created by public policies that support the production and consumption of fossil fuels. Thus, similarly to the electricity produced with renewable energy in *Canada–Feed-In Tariff Program*, these products may not be considered "like" goods that have a lower climate impact. It is important to stress that subsidies for fossil fuels dwarf subsidies for clean energy. According to the International Renewable Energy Agency, in 2017, 70% of global direct energy sector subsidies went to fossil fuels and only 20% to renewable power energy.[156]

Effective BCA mechanisms are less likely to be seen as discriminatory than explicit BCA mechanisms because the former account for a broader set of carbon constraints imposed on imported and domestic products. This aspect is especially relevant against potential claims of *de facto* discrimination that could be brought forward against the implementation of a BCA mechanism. Under an explicit BCA mechanism, only producers from the relatively few jurisdictions with an explicit carbon price in place would see the price they pay domestically credited on their exports (if they fall under the scheme).[157] Instead, under an effective BCA mechanism, producers from virtually any country would see the price they pay

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152. *Id.*

153. Englisch & Falco, *supra* note 136.

154. *See* Ian Parry, Simon Black & Nate Vernon, *Int'l Monetary Fund, Still Not Getting Energy Prices Right: A Global and Country Update of Fossil Fuel Subsidies*, IMF(2021), https://www.imf.org/en/Publications/WP/Issues/2021/09/23/Still-Not-Getting-Energy-Prices-Right-A-Global-and-Country-Update-of-Fossil-Fuel-Subsidies-466004

155. *Energy Subsidies: Tracking the Impact of Fossil-Fuel Subsidies*, INT'L ENERGY AGENCY, https://www.iea.org/topics/energy-subsidies [https://perma.cc/29ZT-Z93M].

156. Michael Taylor, *Energy Subsidies: Evolution in the Global Energy Transformation to 2050*, INT'L REN. ENERGY AGENCY (2020).

157. Currently, most developing countries do not have an explicit carbon price in place, and only about 23% of global GHG emissions are covered by an explicit carbon price. *See Carbon Pricing Dashboard*, WBG, https://carbonpricingdashboard.worldbank.org/map_data [https://perma.cc/TA5M-LY4G] .

domestically recognized in the BCA mechanism.[158] Thus, this is *de facto* a less discriminatory way of designing BCA mechanisms.

All else being equal, we conclude that an effective BCA mechanism is more likely to comply with Article III, § 2 than an explicit BCA mechanism. While we recognize that there is uncertainty about whether a BCA mechanism that results in a higher carbon price applied on imported products would be compatible with this provision, some case law suggests that the two products would not be considered "like." If this interpretation is followed, a BCA mechanism that imposes charges proportional to the GHG emissions embedded in products may be seen as complying with the national treatment clause.

B. GATT Article I Comparison of Effective and Explicit Carbon Prices

The other main non-discrimination provision of the GATT is Article I, which establishes that the importing country must grant equal treatment to "like" imported products regardless of the country of provenance. Under Article I, the likeness of two products is determined by various factors, especially whether they are in a competitive relationship.[159] As with Article III, § 2, a BCA mechanism might be incompatible with Article I if like products are subject to different tariffs due to differences in embedded GHG emissions. However, as discussed above, there are good reasons to believe that two products with different levels of embedded GHG emissions are not "like" one another, so we do not see this as an insurmountable issue.

Another key concern on the compatibility of BCA mechanisms with Article I is that tying duties on otherwise-"like" imported products to climate change policies could constitute discrimination between exporting countries. This is a position commonly held in scholarly research[160] and grey literature,[161] and existing case law supports this view.

A case suggesting that crediting for policies abroad would be incompatible with Article I, § 1 is *Belgian Family Allowances*.[162] Belgium had imposed a domestic tax on imported products bought by public bodies. The measure exempted imports from countries with a system of family allowances that was similar to Belgium's. Norway and Denmark brought a complaint under GATT claiming that their system for family allowances met the exemption requirements, but their imports had not been exempted from the tax. The Panel ruled that the whole system of exemptions violated Article I, § 1. Another case that supports the incompatibility

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158. Most if not all countries levy taxes or other fees on fossil fuels. *See* Mahdavi et al., *supra* note 63.

159. Englisch & Falco, *supra* note 136.

160. Charnovitz, *supra* note 148, at 40; Englisch & Falco, *supra* note 136; JOOST PAUWELYN, U.S. FEDERAL CLIMATE POLICY AND COMPETITIVENESS CONCERNS: THE LIMITS AND OPTIONS OF INTERNATIONAL TRADE LAW, DUKE UNIV.: NICHOLAS INST. FOR ENV'T POL'Y SOLUTIONS (Apr. 2007), https://nicholasinstitute.duke.edu/climate/policydesign/u.s.-federal-climate-policy-and-competitiveness-concerns-the-limits-and-options-of-international-trade-law; PIRLOT, *supra* note 137, at 240; Trachtman, *supra* note 9, at 477.

161. FLANNERY ET AL., *supra* note 26.

162. Panel Report, *Belgian Family Allowances* (*Allocations Familiales*) (adopted by the contracting parties Nov. 7 1952) (G/32 - 1S/59).

of crediting for policies abroad with NMFT is *Superfund*. The U.S. government had imposed a border adjustment tax on imported products and the ECC contested this measure on the grounds that it resulted in double taxation from the United States and ECC. The Panel rejected this argument, indicating that the tax on imported products should, in principle, equal the tax that would have been imposed on these products under domestic measures.[163] Both *Belgian Family Allowances* and *Superfund* suggest that crediting for policies abroad may be incompatible with NMFT.

Next, we consider the question of whether the incompatibility of the BCA mechanism with Article I, § 1 turns on whether the mechanism credits explicit or implicit carbon prices. In this respect, as under Article III, § 2, a BCA mechanism that credits effective carbon prices is less likely to be seen as *de facto* discriminatory than a BCA mechanism that considers only explicit carbon prices. This is because the former accounts for a broader set of carbon constraints—thereby allowing virtually all countries to see their policies credited in the BCA mechanism.

Overall, Article VII, §§ A and B show that if a BCA mechanism is scrutinized under the GATT, it is more likely to comply with Article I and Article III, § 2 if it credits for effective carbon pricing. However, it is uncertain whether any BCA mechanism could be compatible with Article I.

In light of this, we discuss whether building BCA mechanisms around effective or explicit carbon prices can make a difference regarding the application of Article XX. Article XX provides a list of exceptions that could justify violations of other GATT provisions on public policy grounds. Article XX (b) and (g) provide two relevant environmental provisions that may justify a BCA mechanism despite conflict with the non-discrimination provisions. We discuss these two provisions in turn, followed by the relative compatibilities of effective and explicit BCA mechanisms with the Chapeau of Article XX.

C. GATT Article XX Exception (b)

Exception (b) of GATT Article XX allows for measures that are "necessary to protect human, animal or plant life or health."[164] There is overwhelming evidence of the severe risk that climate change poses to human, animal, and plant life and health, in frequency of extreme weather events, spreading of diseases, and destruction of ecosystems.[165] Thus, exception (b) is likely to apply to a BCA mechanism aimed to reduce carbon leakage.

To meet the requirements of the Article XX (b) exception, the measure must also make a "material contribution" to protecting human, animal, or plant life or health. According to the Appellate Body, this requires a "genuine relationship of ends and means between the objective pursued and the measure at issue."[166] This

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163. Panel Report, *United States—Taxes on Petroleum and Certain Imported Substances*, ¶ 5.2.8, GATT Doc. (June 17, 1987).

164. GATT, *supra* note 131, at Article XX (b).

165. IPCC SPECIAL REPORT, *supra* note 112.

166. Appellate Body Report, *Brazil—Measures Affecting Imports of Retreaded Tyres*, ¶¶ 145, 210, WT/DS332/AB/R (Dec. 3, 2007) [hereinafter AB Report, Brazil—Retreaded Tyres].

implies that the BCA mechanism needs to be effective in reducing GHG emissions. As discussed in Part III, there are various reasons to believe that effective BCA mechanisms can mitigate climate change to a greater degree than explicit BCA mechanisms. In light of their potential GHG mitigation outcomes, effective BCA mechanisms are likely to be seen as making a material contribution to protecting human, animal, or plant life or health if adequately designed.

Complying with Article XX (b) requires that no reasonably available and less trade-restrictive alternatives exist. The complaining party must show the existence of such an alternative measure.[167] The trade impact of the BCA mechanism will depend on various factors, including the administrative burden it poses for compliance. Crediting for effective carbon prices is likely to increase the administrative and compliance costs of the measure compared to crediting for explicit carbon prices,[168] and the related cost could be felt particularly in countries with lower levels of capacity. To address this issue, a share of the revenues from the BCA could support countries with limited capacity to estimate domestic effective carbon prices. Moreover, the flexible nature of the effective BCA mechanism as compared to the explicit model indicates the former may be the least trade-restrictive alternative as the foreign government is free to match the degree of the importing country's climate change policy by any means they choose.

Article XX (b) also requires that the measure be proportional to the values it aims to achieve: the more important the interests being pursued, the more likely the measure is to pass the proportionality test.[169] Addressing climate change is one of the fundamental priorities of our time, and both effective and explicit BCA mechanisms can support this endeavor. Thus, the proportionality test is unlikely to be a major barrier to the implementation of any carefully structured BCA mechanism. But it would deter poorly crafted BCA approaches or those that are fundamentally disguised barriers to trade rather than environmental provisions.

D. GATT Article XX Exception (g)

Exception (g) protects measures that relate "to the conservation of exhaustible natural resources."[170] Is a stable climate an exhaustible natural resource? In *Shrimp-Turtle I*, the Appellate Body held that what constitutes an exhaustible natural resource should be established "in the light of contemporary concerns of the community of nations" about environmental protection.[171] International concern for climate change is manifest from the wide ratification of international climate change treaties such as the Paris Agreement.[172] Both explicit and effective BCA

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167. Appellate Body Report, *United States—Measures Affecting the Cross-Border Supply of Gambling and Betting Services*, ¶ 309, WT/DS285/AB/R (adopted April 20, 2005).

168. *See supra* Part V.

169. Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products*, 172, WT/DS135/AB/R (adopted Mar. 12, 2001).

170. GATT, *supra* note 102, at Article XX (g).

171. Appellate Body Report, *United States—Import Prohibition of Certain Shrimp and Shrimp Products*, ¶ 129, WT/DS58/AB/R (adopted Nov. 6, 1998) [hereinafter AB Report, Shrimp-Turtle I].

172. Mehling et al., *supra* note 9, at 467.

mechanisms relate to the "conservation of exhaustible natural resources,"[173] as both mitigate climate change. Effective BCA mechanisms relate to the conservation of exhaustible natural resources more strongly because, as discussed in Part III.A, these instruments incentivize environmental action beyond GHG mitigation measures. Such action could include policies strictly related to conserving natural resources, such as clean air. Clean air has been recognized by the Panel in *US-Gasoline* as an exhaustible natural resource.[174]

More generally, building BCA mechanisms around effective carbon prices encourages attention to sustainability broadly—not just climate change. Allowing countries to enact policy designs consistent with their own political circumstances will foster the development of a wider array of climate change policies, including instruments that can better address other environmental issues. While climate change is one of the most pressing environmental challenges that humanity faces today, other environmental problems severely threaten human, animal, and plant life and health on Earth. For instance, research on planetary boundaries identifies nine Earth systems that have allowed human society to thrive in the Holocene. Transgressing one or more of these boundaries can have adverse consequences for humans and other species on the planet.[175] Climate change is only one of these boundaries—ocean acidification, biodiversity loss, and ozone depletion all threaten life on Earth as well. Incentivizing environmental action on multiple fronts, rather than a narrow focus on GHG pricing, may help achieve greater sustainability at the global level.

Another requirement of this provision is that the BCA mechanism must "relate to" conserving exhaustible natural resources. This requirement would be easily met by a measure that aims to mitigate climate change, such as a BCA mechanism.[176] Because the Appellate Body has held that as long as the measure is not merely "incidentally" aimed at the conservation of exhaustible natural resources, both types of BCA mechanisms should meet this requirement.[177]

Finally, under Article XX Exception (g), the measure should be "made effective in conjunction with restrictions on domestic production or consumption." Case law suggests that this element requires evenhanded treatment of domestic and imported products.[178] In *US—Gasoline*, the Appellate Body has stated that evenhanded treatment does not require *identical* treatment.[179] This element of

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173. GATT, *supra* note 102, at Article XX (g).

174. Panel Report, *United States—Standards for Reformulated and Conventional Gasoline*, ¶ 6.37, WTO Doc. WT/DS2/R (adopted May 20, 1996), as modified by the Appellate Body Report, WTO Doc. WT/DS2/AB/R (adopted May 20, 1996).

175. Johan Rockström et al., *Planetary Boundaries: Exploring the Safe Operating Space for Humanity*, 14 ECOLOGY & SOC'Y 32 (2009); Will Steffen et al., *Planetary Boundaries: Guiding Human Development on a Changing Planet*, 347 SCIENCE 6223 (2015).

176. Joost Pauwelyn, *Carbon Leakage Measures and Border Tax Adjustments Under WTO Law*, RES. HANDBOOK ON ENV'T, HEALTH AND THE WTO 448, 500 (Geert van Calster & Denise Prevost eds., 2013).

177. AB Report, Shrimp-Turtle I, *supra* note 171, at ¶ 136.

178. Appellate Body Report, United States—*Standards for Reformulated and Conventional Gasoline*, ¶21, WTO Doc. WT/DS2/R (adopted May 20, 1996).

179. *Id.*

Article XX (g) does not seem to pose a significant limit on the implementation of explicit or effective BCA mechanisms. However, one could argue that the evenhandedness of treatment is better assured by effective BCAs mechanisms than explicit BCA mechanisms. The former encompasses a broader set of measures and is therefore better able to capture restrictions imposed on domestic and imported products.

E. GATT Article XX Chapeau

In addition to meeting the requirements of at least one of the exceptions, Article XX will only justify a measure if it complies with the Chapeau provision, which requires that a measure not be applied in a way that constitutes arbitrary or unjustifiable discrimination between countries where similar conditions prevail, or a disguised restriction on international trade.[180]

According to the Appellate Body,[181] avoiding arbitrary and unjustifiable discrimination requires that the measure be applied fairly, respecting due process.[182] This could include processes that allow exporting countries to assess their domestic climate change policies and compare them with policies implemented in the importing country.[183] Effective BCA mechanisms may better meet this requirement because they incorporate climate policies beyond explicit GHG pricing. By crediting for implicit GHG pricing, the effective BCA mechanism avoids arbitrary, unfair distinctions between countries that strictly impose an explicit carbon pricing scheme and countries that achieve similar results using other policies.

The Chapeau also requires that the measure not discriminate against countries where the same conditions prevail, meaning that the measure needs to be applied with a degree of flexibility that considers the conditions prevailing in any exporting nation.[184] In other words, importing countries cannot require exporting countries to adopt their domestic regulatory programs.[185] However, they can require that the regulatory program implemented in the exporting country is comparably effective and suitable for conditions in the exporter's territory.[186] To meet this requirement, a BCA mechanism should take into account the level of development and the climate change policies implemented by the exporting country.[187]

A BCA mechanism that credits for effective carbon prices places fewer restrictions on the types of policies that an exporting country can adopt to avoid charges at the border. Explicit BCA mechanisms restrict the choice for the exporting country to either carbon taxes or emissions allowances trading schemes and could therefore be seen as imposing the adoption of a specific measure abroad. An effective BCA gives the exporting country more freedom to implement policies that

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180. GATT, *supra* note 131, at Article XX.
181. AB Report, Shrimp – Turtle I, *supra* note 171, ¶ 181.
182. *Id.*
183. Mehling et al., *supra* note 9, at 468.
184. Appellate Body Report, *United States—Import Prohibition Of Certain Shrimp And Shrimp Products Recourse To Article 21.5 Of The DSU By Malaysia*, ¶ 149 WT/DS58/AB/RW (adopted Oct. 22, 2001) [hereinafter AB Report, Shrimp—Turtle II].
185. AB Report, Shrimp – Turtle I, *supra* note 171, ¶ 164.
186. AB Report, Shrimp—Turtle II, *supra* note 184, ¶ 149.
187. Pauwelyn, *supra* note 186, at 502–03.

better suit its political, energy, and environmental priorities.[188] The Appellate Body's ruling in *Shrimp-Turtle II* demonstrates that flexible process and production method-based measures that require foreign producers to achieve an emissions regulation standard based on a domestic standard are permissible *so long as* they do not mandate how foreign producers achieve that standard.[189] Effective carbon pricing instruments are easier to implement and may be better suited to developing countries.[190] Thus, a BCA mechanism that credits for effective carbon prices may be better suited to meet Article XX's Chapeau requirement than a BCA mechanism that credits only for explicit carbon prices because it does not dictate *how* standards are to be met.

In Part VI, we argued that adequately designed BCA mechanisms should be seen as compatible with the GATT because they operationalize a multilateral commitment shared by all WTO Members to meet the temperature targets of the Paris Agreement. We also argued that a review mechanism under relevant international agreements could establish which sub-global policies are sufficiently multilateral to avoid scrutiny under the GATT.

Finally, we analyzed whether crediting for either effective or explicit carbon prices affects the likelihood that a BCA mechanism complies with the GATT. Our analysis suggests that building BCA mechanisms around *effective* carbon prices is more likely to be compatible with the main non-discrimination provisions of the GATT, as well as with the exceptions and the Chapeau of Article XX.

CONCLUSION

The United States and EU are currently considering implementing BCA mechanisms to address risks of carbon leakage, encourage climate ambition at home and abroad, and ensure a level playing field in the international market. Acting in parallel, the two jurisdictions take different stances on what policies to adopt. The EU has taken a narrow approach whereby its CBAM provides tariff credit only for explicit carbon prices. The United States has instead called for a BCA design that credits a broader set of implicit GHG pricing policies.

This Article's central thesis is that BCA mechanisms that credit both explicit and implicit carbon prices could yield greater GHG emission reductions across the board, are more likely to be compatible with the GATT, and are more likely to support international cooperation on climate change than BCA instruments that credit exclusively for explicit carbon prices. In addition, we argue that many jurisdictions, including the EU and United States, have significant capacity to impose this administratively complex form of BCA derived from their imposition of charges on imported products to rectify trade distortions. This capacity should be harnessed to overcome the administrative challenges and ensure global, collective action in the fight against climate change.

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188. *See supra* Section III.A.1.

189. AB Report, Shrimp—Turtle II, *supra* note 184, ¶¶ 135–150. Similarly, see also Porterfield, *supra* note 138, at 34.

190. *See supra* Section III.A.2.

Ultimately, this Article challenges the standard view that BCA mechanisms are unilateral measures under the GATT. In light of the 2015 Paris Agreement, we argue that well-designed BCA mechanisms should be understood as acts of multilateral-unilateralism—and thus should be considered approved by all parties to the Paris Agreement. We call for the institution of a review mechanism under the UNFCCC or WTO to assess proposals for climate change policy measures that affect trade, such as BCA mechanisms. We argue that measures aligned with the Paris Accord and with a trade burden that is not disproportionate to the climate change policy gain should not be subject to further legal scrutiny under the GATT.