CARBON BORDER ADJUSTMENTS: CONSIDERATIONS FOR POLICYMAKERS

Chris Kardish, Jason Ye, and Nat Keohane, Center for Climate and Energy Solutions

Carbon border adjustments, also referred to as "carbon border adjustment mechanisms" (CBAM), are an emerging set of trade policy tools that aim to prevent carbon-intensive economic activity from moving out of jurisdictions with relatively stringent climate policies and into those with relatively less stringent policies. Border adjustments have the potential to increase the environmental effectiveness of climate policies, by averting shifts in economic activity that could lead to higher total greenhouse emissions—a phenomenon known as "carbon leakage." They are also seen as a way of protecting industrial competitiveness by reducing the incentive for businesses to move production abroad. The European Union (EU) is pursuing a CBAM that would make the region the first in the world to enact such a policy and would be aligned with the carbon price the bloc applies through its emissions trading system (ETS). Interest in border adjustments, paired without an explicit price, is growing in the United States.

This primer provides a comprehensive introduction to the topic. After a brief explanation of basic concepts, it reviews the EU's proposed CBAM and U.S. congressional border adjustment provisions introduced in the 117th Congress (2021–2022). It also outlines key considerations in designing a carbon border adjustment.

WHAT ARE CARBON BORDER ADJUSTMENTS?

Carbon border adjustments are known by many different names, including border carbon adjustments or border tax adjustments, but they all aim to achieve the same objectives: Address differences in the domestic climate policies, and the resulting emissions intensity of production, between trading partners. By accounting for these differences in climate ambition and emissions from the production of goods, carbon border adjustments are designed to protect industrial competitiveness and avoid shifting production—and emissions—to countries with dirtier processes or weaker environmental standards, which is known as carbon leakage.

Carbon emissions leakage occurs when a geographic shift of production between countries without any net benefit to global greenhouse gas emissions, either through shifts in investment patterns, loss of market share for domestic industries to more emissions-intensive trading partners, or changes in energy markets that result in greater global emissions.[1] To date, evidence on carbon leakage has been mixed. Most studies have little to no evidence of leakage occurring, though much of the existing research on carbon leakage was completed during periods of low carbon prices and significant sectoral exemptions from climate policies.[2] Contrary to earlier research, a recent study found significant leakage rates, particularly in small open economies such as individual European Union (EU) countries.[3] Regardless of the uncertainty surrounding the impact of carbon leakage, it remains a concern of policymakers for some emissions-intensive industries in countries with ambitious climate policies, especially those with steadily rising carbon prices.

Carbon border adjustments apply fees on imported goods based on their emissions content and can also include rebates or exemptions from domestic policies for domestic producers that export their goods to markets abroad, especially to countries with laxer climate poli-

cies. Proposals for carbon border adjustments typically envision that the price an importer would pay would be aligned with a domestic carbon price. Recent discussions in the United States, however, contemplate an implicit carbon price based on a range of regulatory and other policies.

STATUS AND OUTLOOK

Some observers have raised concerns that carbon border adjustments could amount to disguised protectionism; at a minimum, such policies involve unsettled issues of trade policy that have the potential to provoke disputes in the World Trade Organization (WTO). The WTO's General Agreement on Tariffs and Trade (GATT) includes protections aimed at ensuring equal treatment of domestic and foreign-produced goods, which a border adjustment could violate if not carefully designed. While the GATT allows exceptions for certain policies on environmental grounds, it nonetheless prohibits any measure that amounts to arbitrary or unjustifiable discrimination against trading partners.[4]

Carbon border adjustments are also sometimes criticized as incompatible with the United Nations Framework Convention on Climate Change (UNFCCC), particularly Article 3.5, which forbids measures that constitute "arbitrary or unjustifiable discrimination" or serve as a "disguised restriction on international trade."[5] International observers have also expressed concerns that border adjustments can stifle multilateral climate efforts through the UNFCCC.

No jurisdiction has yet put in place a carbon border adjustment, but interest is growing among policymakers. The EU is seriously considering a proposed carbon border adjustment mechanism (CBAM), Canada has issued a request for information on such an approach, the United Kingdom's parliament has initiated an inquiry, and California applies a mechanism resembling a border adjustment on imported electricity under its cap-and-trade program.[6]

Moreover, carbon border adjustments are becoming a topic of discussion in international political forums. In May 2022, leaders of the Group of Seven (G7) agreed to explore establishing "an open, cooperative international Climate Club to support the implementation of the Paris Agreement, consistent with international rules and with participation beyond the G7," and announced plans to revisit the idea in October 2022.[7] However, some of the large countries that would likely be among the most impacted by a coordinated carbon border adjustment are opposed to the idea. In May 2022, the so-called "BRICS" countries—Brazil, Russia, India, China, and South Africa—issued a joint statement opposing "any measures to restrict trade and investment and setting up new green trade barriers with the pretext of addressing climate change, such as the imposition of Carbon Border Adjustment Mechanisms, which are incompatible with multilateral rules under the World Trade Organization."[8]

EU'S PROPOSED CARBON BORDER ADJUSTMENT MECHANISM

In July 2021, the European Commission released a package of proposals to help the EU achieve its updated climate targets of reducing net greenhouse gas emissions 55 percent below 1990 levels by 2030 and becoming carbon neutral by 2050.[9] The proposals include establishing a CBAM that would put a carbon price on imports of covered goods to ensure that ambitious climate action in Europe does not lead to carbon leakage. The CBAM is intended to serve as an alternative to distributing free emissions allowances to industrial sectors, which serves as the current leakage protection mechanism under the European Union Emission Trading System (EU ETS) but is seen as unsustainable and ineffective as a decarbonization strategy. It also aims to encourage industry outside the EU to take steps in the same direction to reduce emissions. Revenues from the CBAM would go toward the EU's general budget.

Under the proposal, the CBAM would be introduced in a transitional period from 2023 to 2025. During this period, a reporting system would apply to importers of covered goods to facilitate a smooth rollout of the program, gather data, and to facilitate dialogue with non-EU countries. Starting in 2026, the CBAM would become fully operational, and importers would start paying a financial adjustment. As the CBAM phases in, the existing system of free allowances under the EU ETS for sectors covered by the CBAM would be phased out. The goal is to transition from a system of free allowances to the CBAM so EU producers will be incentivized to reduce emissions through exposure to the carbon price while still maintaining leakage protections. During this period, the CBAM fee that importers face would be reduced to reflect the value of free allowances until the

phaseout is completed.

The CBAM would initially cover goods from sectors at high risk of carbon leakage: cement, iron and steel, aluminum, and fertilizers. The proposal would also cover electricity generation, given increasing interconnectivity with the EU's more emissions-intensive neighbors, such Ukraine, Turkey, and countries in North Africa and the Balkans. Before the end of the transitional period, the CBAM could be extended to cover other goods.

Under the program, importers would be required to purchase certificates equal to the total embedded emissions of the covered good each year. The price of the CBAM certificate would be based on the weekly average auction price of EU ETS allowances. If a non-EU producer can show that they already paid a price for carbon emitted during production of the imported good, then that price could be deducted from the fee paid by the importer.

Importers would calculate the embedded emissions of their goods according to procedures that are yet to be fully established and would need to independently verify their calculations. Embedded emissions covered by the CBAM (expressed in metric tons of carbon dioxide equivalent) are largely the direct emissions released on site during the production of goods (scope 1), though there is likely to be coverage of inputs to the production process where those inputs are also goods covered under the CBAM (scope 3). The method for calculating embedded emissions will vary by the type and complexity of good. If the actual direct emissions data is not available, then importers will be allowed to use default values for determining embedded emissions in the good. Where feasible, default values for goods will be set at the average emission intensity of each exporting country and for each covered good except for electricity. The proposal does not include indirect emissions from electricity or purchased heat (often referred to as scope 2), though the commission will evaluate the possibility of including such indirect emissions before full implementation of the CBAM.

Actual emissions data could only be used under narrow circumstances for electricity because of technical and market challenges. The default value for electricity will be based on the best available data determining the average emissions factor in metric tons of carbon dioxide per megawatt-hour of price-setting sources in the non-EU country, group of non-EU countries, or region within a non-EU country. By the end of 2025, the European Commission will evaluate the CBAM system and determine whether to include calculations of indirect emissions from purchased electricity and heat. Indirect emissions from transportation are not expected to be considered for coverage during this review, which likely reflects the administrative complexity they would introduce and concerns about WTO compatibility, since the EU ETS does not cover transportation.

Certain non-EU countries who participate in the EU ETS or have an emissions trading program linked with the EU ETS will be excluded from the CBAM system. In addition, the EU can negotiate agreements with other countries that could be considered an alternative to application of the CBAM.

The commission's proposal is currently being reviewed by the European Parliament, which, along with the Council of the EU, negotiates final legislative packages. The final legislation could therefore change from the commission's initial proposal, including changes to the sectors covered under the CBAM and other key facets of its design.

U.S. INTEREST IN BORDER ADJUSTMENTS AND TARIFFS

Proposals for border adjustments have traditionally been paired with carbon pricing policies and framed as a means of addressing concerns around emissions leakage resulting from a carbon price. Partly prompted by the EU's proposed CBAM, however, there is nascent interest among U.S. policymakers—both on Capitol Hill and in the Biden administration—in implementing a carbon border adjustment without an explicit domestic carbon price.

In July 2021, Senate Democrats announced that their $3.5 trillion budget reconciliation blueprint would include a carbon border adjustment. Following the budget blueprint announcement, Sen. Chris Coons (D-Del.) and Rep. Scott Peters (D-Calif.) introduced the Fair, Affordable, Innovative, and Resilient (FAIR) Transition and Competition Act that would establish a border carbon adjustment based on an implicit carbon price. (For a summary of this and other border adjustment provisions, see the section below on *Carbon border adjustments in federal legislative proposals*.)

There is also growing interest among Republicans in a border adjustment. In December 2021, Senator Kevin Cramer(R-N.D.) wrote an op-ed with President Donald Trump's former national security advisor H.R. McMaster arguing that a transatlantic climate and trade initiative would reduce emissions, increase energy security, and reduce Russia's ability to use energy to coerce Europe. The initiative could include a joint trade mechanism between the United States and EU that would levy a common carbon fee on imported goods. Cramer and McMaster argue that a carbon border fee would be far more damaging to the Russian economy than sanctions since the lifecycle greenhouse gas emissions of Russia's fossil fuel exports to Europe are about 40 percent higher per unit of energy than U.S. shipments of liquefied natural gas. Cramer does not support linking a border adjustment to an explicit domestic carbon price.[10]

There is also bipartisan interest in this policy. Carbon border adjustments were discussed in the bipartisan energy security conversations held by senators in May 2022. Senator Bill Cassidy (R-La.) indicated that he is working with a bipartisan group of lawmakers to draft a "carbon border mechanism that would address rising greenhouse gas emissions in China and skirt onerous international trade rules."[11]

While there is interest in developing legislation to implement a carbon border adjustment, some observers have suggested the president already has the executive authority to implement a form of carbon border adjustments (i.e., carbon import tariff). Advocates of this approach argue that President Joe Biden could implement a tariff based on carbon emissions under Section 232 of the Trade Act of 1962, which allows the president to restrict imports of goods critical to national security. For instance, President Donald Trump used Sec. 232 to place tariffs on steel and aluminum and to create negotiating leverage for other goods.[12] Recent Sec. 232 tariff agreements provide an indication of how the Biden administration is looking to advance carbon-based trade policies to encourage domestic manufacture of clean steel and aluminum while at the same time aligning global trade with climate goals.[13]

In October 2021, the United States and the EU reached an agreement to lift tariffs on each other's steel and aluminum exports. The United States will lift tariffs on a certain amount of EU-produced metals imported into the United States, and the EU will pause its retaliatory tariffs. The United States and the EU plan to replace these tariffs with the first carbon-based sectoral arrangement on steel and aluminum trade by 2024. Details have yet to be worked out, but the expectation is that both jurisdictions would align efforts to place import tariffs based on emissions criteria (e.g., emission intensity of products).[14] The arrangement would be open to any country interested in joining that meets criteria for restoring market orientation and reducing trade in high-emissions steel and aluminum products.

Following the U.S.-EU agreement, in February 2022, the United States and Japan reached an agreement to allow historically-based, sustainable volumes of steel imports from Japan. The agreement includes conferring on methodologies for calculating steel and aluminum carbon intensity and sharing emissions data.[15]

In the U.S. context, a key design issue concerns whether and how a border adjustment could be implemented in the absence of a federal price on carbon. The Biden administration has acknowledged the difficulty in calculating the environmental cost without an explicit carbon price. However, Biden economic and climate advisors have argued that the technical challenge of basing a border adjustment on an implicit carbon price is not insurmountable, encouraging further research on methodologies, and suggesting that the implicit price created through the U.S. policy mix can be harmonized with explicit carbon prices abroad.[16]

A related issue is whether a border adjustment could be implemented in the absence of any associated federal policies to directly address domestic emissions. Some observers argue that a carbon tariff could be based purely on differences in emission intensity.[17] However, some policymakers and analysts raise concerns that such an approach, in the absence of regulatory policies to justify it, would be seen as protectionist and as an arbitrary and impermissible violation of the core WTO principles of nondiscrimination and national treatment.

POLICY DESIGN OPTIONS AND IMPLICATIONS

At first glance, a carbon border adjustment appears relatively straightforward. The border adjustment is essentially the product of a price (in dollars per ton of

EQUATION 1: General formula for calculating border adjustments

border adjustment = price × emissions intensity of a good × quantity of good

emissions), the emissions intensity associated with the production of a covered good (in tons of carbon dioxide equivalent emissions per unit of the good), and the quantity of the good.

However, there are significant design questions associated with what to base the price on and how to measure and account for the emissions associated with production of a good. More broadly, there are questions about scope and coverage, and the treatment of foreign carbon pricing and border adjustment policies.

Design choices must also be weighed against:

- Fairness: Does the policy benefit particular groups within a sector or does it benefit certain sectors over others?
- Ease of administration: Is the policy difficult to implement and administer?
- Data availability: Is the necessary emissions data readily available or possible to obtain?
- WTO compatibility: Does the policy adhere to WTO rules aimed at preventing discriminatory trade practices?
- Potential alignment with other countries' programs: Does the policy recognize similar programs in other countries and adjust import fees accordingly?
- Emissions reduction: Does this policy lead to emission reductions domestically as well as abroad?
- Competitiveness: Does the policy protect the competitiveness of covered industries? If so, is this protection durable or static?

PRICING OPTIONS

There are three main ways to determine the price used in calculating a carbon border adjustment: an explicit carbon price, an implicit carbon price, or a performance standard with a fee. The choice will reflect the policies that are already in place for domestic industries and will have implications for the complexity of implementing a carbon border adjustment as well as the potential for a WTO challenge.

Explicit carbon price: Fundamentally, the aim of a border adjustment is to create a "level playing field" by imposing the same cost on imported goods as domestic producers face under mandatory climate policies. If those policies involve an explicit carbon price, such as a carbon tax or an allowance price in an emissions trading system, then that price can be readily applied to the border adjustment. An explicit carbon price offers the easiest approach to implement a border adjustment. Almost all congressional carbon tax proposals include a border adjustment. The EU CBAM is based on an explicit price: the market price of an allowance in the EU ETS.

Implicit price: In the absence of a domestic carbon pricing program, a border adjustment could be based on an "implicit price" representing the estimated marginal cost to domestic producers of reducing greenhouse gas emissions to comply with relevant laws, regulations, and executive actions. An implicit price offers the most difficult approach to implement a border adjustment. Calculating the implicit price based on these metrics could be complicated, especially when factoring in different local, regional, state, and national programs and determining average marginal costs that are related to controlling greenhouse gas emissions. The challenge of establishing a fair and representative methodology also makes an implicit price approach more likely to lead to WTO disputes.

Performance standard with fee: A third approach is to establish a performance standard for domestic producers alongside a border adjustment for importers that mirrors the performance standard. Performance standards rely on benchmarks expressed in terms of emissions intensity. Under a fee-based performance standard with a border adjustment, both domestic producers and importers in each covered sector would face a charge for each ton of emissions in excess of a common sectoral benchmark. The fee could be set relative to the social cost of carbon or at another pre-determined level, with

predictable increases over time. (While such a fee can be viewed as a form of carbon pricing, it differs from a conventional carbon tax in that it is levied only on emissions above the performance standard.) Sectoral benchmarks could be tied to average emissions intensities, "best in class" performance, or some other referent; they would need to be tightened over time to incentivize deeper emissions reductions.

PRODUCT COVERAGE

Developing eligibility criteria is an important step in determining which goods would be covered by the border adjustment.

Fundamentally, there's a question of which goods should be subject to the border adjustment. Placing a border adjustment on all imports could be difficult to administer given manufactured or finished goods (e.g., cars, electronics, appliances, etc.) are made up of various components from different regions. Assuming the instrument aims to cover emissions beyond those that occur directly at a facility, the importer would have to know the associated emissions of key components that make up the finished good, which is particularly difficult given international supply chains. It is likely administratively easier to implement a border adjustment on only basic industrial materials and fuels (e.g., steel, aluminum, cement, natural gas). These are also the goods for which the rationale of implementing a border adjustment is strongest because they have high emissions intensity relative to their value and are highly traded, with prices set by international markets, which makes them more susceptible to losses of competitiveness than more complex final goods. Their placement higher upstream in product value chains also makes covering them advantageous from an administrative standpoint and emissions-reduction potential.

There are also criteria that can help determine which goods would be covered by the border adjustment:

Specified products: Carbon border adjustments provisions have generally covered traditional energy-intensive, trade-exposed (EITE) products (e.g., iron, steel, aluminum, cement, glass, pulp and paper, chemicals, and industrial ceramics) since these goods are most at risk for emissions leakage. However, specifying sectors and products without considering the actual increase in the cost of production from climate policies could be seen as giving an advantage to domestic producers of those sectors.

Intensity metrics: Eligibility criteria could also be based on metrics such as carbon intensity or energy and trade intensity. For example, goods with carbon emissions per kilogram of product above a certain threshold would be covered.[18] The degree of international trade in a sector is also a useful metric for determining border adjustment eligibility. Together, emissions and trade intensity are commonly used to determine eligibility for carbon leakage protections under climate policies, including in the California cap-and-trade program and the EU ETS.

Specified products and intensity metrics: Another approach would be to determine covered goods from industrial sectors with a six-digit North American Industry Classification System (NAICS) code and use metrics such as greenhouse gas or trade intensity. This would be a more targeted approach to address any cost concerns resulting from competitiveness.

CARBON ACCOUNTING OF EMISSIONS AND SCOPE OF EMISSIONS COVERAGE

One of the biggest challenges in terms of implementing a border adjustment is accounting for the emissions involved in the production of domestic goods and for imported goods. Generally, a border adjustment reflects the emissions associated with the production of a covered good, but there are three main considerations to approach this calculation: gases covered, scope of emissions, and aggregation level.

Gases covered: The border adjustment could cover carbon dioxide emissions instead of all greenhouse gas emissions (in terms of carbon dioxide equivalent) associated with a covered good. Carbon dioxide emissions account for about 80 percent of U.S. greenhouse gas emissions and about three-quarters of industrial sector emissions.[19] Most of the remaining emissions from the industrial sector are from methane. Broadening the scope to include non-carbon dioxide gases allow for reductions in short-lived climate pollutants (e.g., methane) that have a relatively short atmospheric lifetime compared to carbon dioxide and usually have a higher warming effect than carbon dioxide.

Scope of emissions: Border adjustments can also vary in their coverage of emissions along product value chains

and lifecycles. One approach could cover direct emissions associated with the production of a covered good (scope 1 emissions). Another approach could include scope 1 emissions and indirect emissions associated with production, which would include electricity consumption of the manufacturing facility (scope 2 emissions). A broader approach could account for other sources of indirect emissions, including those associated with the materials used in the inputs in the production process (upstream scope 3 emissions). And an even broader approach could include transportation of materials to project sites or consumer (downstream scope 3 emissions).

It may be administratively difficult, and unnecessary, to cover all scope 3 emissions, but it may make sense to cover some categories of upstream scope 3 emissions to account for emissions of inputs used for manufactured or finished goods. Failure to do so may lead to leakage risks shifting farther downstream product value chains to goods that contain large amounts of covered materials.

Broadening the scope of emissions covered by the border adjustment heightens implementation challenges due to factors like data availability. Reliable data with third party verification will be critical in determining the appropriate border adjustment. In instances where reliable product-level assessment of emissions is not readily available, there may be opportunities to leverage existing data sources at various levels of granularity (e.g., global, national, regional). For instance, a U.S. industry average could be used as a default value and importers could have an opportunity to submit data to get revised emission determinations. This would help incentivize foreign firms that are cleaner than the U.S. industry average to adopt reliable greenhouse gas accounting standards.

Moreover, a lack of interoperability across greenhouse gas accounting protocols could further complicate emissions accounting for traded goods. Put differently, existing carbon accounting methodologies may not be suited for measuring emissions for a border adjustment. Others have suggested an assessment to key phases before goods reach the borders of another country, when domestic policies take precedence over the use and end-of-life phases of a product.[20]

Aggregation level: Emissions could be accounted for at the product, facility, company, sector, or national level. The administrative complexity of accounting for emissions decreases as data is aggregated from a product to national level. Accounting for sectoral or national level emissions could be one way to incentivize exporting countries to decarbonize. While national or sectoral data may be readily available, it does not differentiate between products or facilities with different carbon intensities, weakening the incentive for foreign producers to reduce emissions. At the same time, using data at a product or facility level makes it easier for foreign producers to engage in resource shuffling, which refers to an effort to reallocate production to reduce exposure to a border adjustment or other climate policy without reducing emissions overall. For instance, a firm that makes aluminum via both hydropower and fossil fuels could export the cleaner, hydropower-produced goods to the country imposing a border adjustment while selling the dirtier goods in markets without border adjustments.

EXPORT REBATES

Congressional proposals that pair a carbon fee with a border tax measure have also included an export rebate for domestic producers. In this scenario, domestic producers would pay a carbon fee associated with the production of a covered good and importers of a covered good would pay a fee associated with the production of a good so as not to disadvantage domestic producers in the home market. This could be paired with rebates associated with the production of a covered good for domestic exporters to ensure they are not disadvantaged in other markets that do not have a similar price on carbon, though this introduces greater administrative complexity and WTO concerns.

In the absence of an explicit price or benchmark price that also applies to domestic producers, a border adjustment should not provide export rebates for domestic producers.

RECIPROCITY WITH OTHER JURISDICTIONS

As more countries adopt carbon pricing and carbon border adjustments, there arises a question of how to treat these policies under a domestic border adjustment. A carbon border adjustment could be suspended or revised based on foreign countries' climate policies. The border adjustment could also reduce the fees importers face based on evidence that the producer faced a carbon price (or other costs from climate policies), which is the approach the EU is taking in its proposed CBAM.

Recognizing climate policies in exporting countries can enhance the effectiveness and fairness of the instrument.

REVENUES

A carbon border adjustment would raise revenues from the levy on imported goods. There are different ways the revenues from the program could be used, such as: innovation and deployment of new technologies for industry, climate resilience, financing climate-friendly development in other countries, etc.

CARBON BORDER ADJUSTMENTS IN FEDERAL LEGISLATIVE PROPOSALS

In the 117th Congress (2021–2022), five carbon pricing proposals have been introduced, all of which include some form of a border adjustment.[21] There have also been two border carbon adjustment proposals introduced this Congress. In July 2021, Sen. Chris Coons (D-Del.) and Rep. Scott Peters (D-Calif.) introduced a proposal that would establish a border carbon adjustment based on non-pricing policies. In June 2022, Sen. Sheldon Whitehouse (D-R.I.) introduced a proposal that would establish a border carbon adjustment based on a performance standard.

The seven proposals that include border adjustment provisions are:

- Sec. 4695 of the America's Clean Future Fund Act (S. 685 and H.R. 2451) introduced by Sen. Dick Durbin (D-Ill.) on March 10, 2021 and by Rep. Marie Newman (D-Ill.) on April 12, 2021
- Chapter 102 of the Energy Innovation and Carbon Dividend Act of 2021 (H.R. 2307) introduced by Rep. Ted Deutch (D-Fla.) on April 1, 2021
- Part 2 of Sec. 101 of the Modernizing America with Rebuilding to Kickstart the Economy of the Twenty-first Century with a Historic Infrastructure-Centered Expansion Act of 2021 (H.R. 3039) introduced by Reps. Brian Fitzpatrick (R-Pa.) and Salud Carbajal (D-Calif.) on May 7, 2021
- Sec. 4693 of the America Wins Act (H.R. 3311) introduced by Rep. John Larson (D-Conn.) on May 18, 2021
- Sec. 4695 of the Save Our Future Act (S. 2085) reintroduced by Sens. Sheldon Whitehouse (D-R.I.), Brian Schatz (D-Hawaii), Martin Heinrich (D-N.M.), Kirsten Gillibrand (D-N.Y.), Jack Reed (D-R.I.), Chris Murphy (D-Conn.), and Dianne Feinstein (D-Calif.) on June 16, 2021
- Fair, Affordable, Innovative, and Resilient Transition and Competition Act (S. 2378 and H.R. 4534) introduced by Sen. Chris Coons (D-Del.) and Rep. Scott Peters (D-Calif) on July 19, 2021
- Clean Competition Act (S. 4355) introduced by Sens. Sheldon Whitehouse (D-R.I.), Chris Coons (D-Del.), and Martin Heinrich (D-N.M.) on June 6, 2022.

While each proposal includes a carbon border adjustment, they differ in terms of their design and specificity. Much of the details of policy design, especially carbon

TABLE 1: Carbon border adjustments in congressional proposals

PROPOSALS	PRICING OPTION	PRODUCT COVERAGE	SCOPE OF EMISSIONS	RECIPROCITY
America's Clean Future Fund Act (S. 685 and H.R. 2451)	Explicit price	Fossil fuels and specified products determined to be EITE.	Emissions from "any inputs or processes used in manufacturing such [carbon-intensive] product" that would be subject to domestic carbon fees. Emissions from the "use, sale, or transfer of [covered] fuel" that would be subject to domestic carbon fees. Exact accounting to be determined through rulemaking.	Foreign credit

PROPOSALS	PRICING OPTION	PRODUCT COVERAGE	SCOPE OF EMISSIONS	RECIPROCITY
Energy Innovation and Carbon Dividend Act of 2021 (H.R. 2307)	Explicit price	Fossil fuels and specified products determined to be EITE.	Emissions "accumulated upon the GHG content of the imported carbon-intensive product" had it been manufactured domestically and subject to domestic carbon fee. Emissions from "fuel's GHG content under the domestic carbon fee, including processing emissions." Exact accounting to be determined through rulemaking.	Foreign credit
MARKET CHOICE Act (H.R. 3039)	Explicit price	Products meeting GHG intensity & trade intensity metrics.	Equivalent to the carbon tax of comparable domestically manufactured goods. Exact accounting to be determined through rulemaking.	Not specified
America Wins Act (H.R. 3311)	Explicit price	Specified products.	Equivalent to the carbon tax of comparable domestically manufactured goods. Exact accounting to be determined through rulemaking.	Foreign credit
Save our Future Act (S. 2085)	Explicit price	Products meeting energy- intensity metrics.	Equivalent to the amount of the carbon fees imposed if good was manufactured domestically multiplied by the average economy-wide carbon intensity metric. Firm-specific carbon intensity metric could be used instead where reliable data is available. Exact accounting to be determined through rulemaking.	Foreign credit
FAIR Transition and Competition Act (S. 2378 and H.R. 4534)	Implicit price	Fossil fuels and specified products.	Emissions from "production, manufacture, or assembly of a product". Emissions from the "extraction, processing, transportation, financing, or other preparation of a covered fuel for use." Benchmark annual average emissions from domestic industrial sectors with reliable data. Exact accounting to be determined through rulemaking.	None
Clean Competition Act (S. 4355)	Benchmark price	Specified products meeting carbon intensity metrics.	Emissions associated with the production of covered primary goods and from electricity used for the production of such goods. Exact accounting to be determined through rulemaking.	None

accounting, have been relegated to the rulemaking process, which could take years to finalize and implement. Table 1 highlights the key policy design parameters of carbon border adjustment provisions in these proposals.

AMERICA'S CLEAN FUTURE FUND ACT

The America's Clean Future Fund Act would establish a carbon fee and a fee on "noncovered fuel emissions." The carbon fee is based on the greenhouse gas content of covered fuels (i.e., fossil fuels). The fee on noncovered fuel emissions is based on carbon dioxide or methane emissions emitted from the production, processing, transport, or use of any product or material within the energy or industrial sectors, including fugitive or process emissions associated with the production, processing, or transport of a covered fuel.

The Durbin proposal would impose a carbon border adjustment fee on imports of carbon-intensive products and covered fuels. Carbon-intensive products are iron, steel, steel mill products, aluminum, cement, glass, pulp, paper, chemicals, industrial ceramics, and any manufactured product determined to be energy-intensive and trade exposed (excluding covered fuels).

Importers of carbon-intensive products would pay a carbon border fee that is equivalent to the costs domestic manufacturers would incur under the carbon fees for any inputs or processes used in manufacturing the good (as determined through rulemaking). Importers of covered fuels would also pay a carbon border fee that is equivalent to the fees for the use, sale, or transfer of the fuel. The carbon border fee could be reduced by the costs associated with a carbon price imposed by the exporting country on these products and fuels.

U.S. exporters of carbon-intensive products and covered fuels would receive a rebate based on the fees imposed before export.

Revenues from the carbon border fee adjustment would go toward helping to fund a carbon fee dividend, agricultural decarbonization, a climate bank, and transition assistance for impacted communities.

ENERGY INNOVATION AND CARBON DIVIDEND ACT

The Energy Innovation and Carbon Dividend Act would establish a carbon fee based on the greenhouse gas content of fossil fuels.

The Deutch proposal would impose a carbon border fee adjustment on imports of carbon-intensive products and covered fossil fuels. Carbon-intensive products are any economic sector or product determined to be prone to carbon leakage because it is energy intensive and trade exposed.

Importers of carbon-intensive products would pay a fee equivalent to the total carbon fee that would have "accumulated upon the greenhouse gas content of the imported product" if the imported product were produced domestically and subject to the carbon fee. Importers of covered fuels would pay a fee equivalent to the total carbon fee that would be imposed on the fuel's greenhouse gas content under the domestic carbon fee, including processing emissions. The Treasury Secretary may adjust the carbon border adjustment fee based on exporting country mitigation efforts and carbon pricing.

U.S. exporters of carbon-intensive products and covered fuels would receive a credit or refund (without interest) based on the carbon fee levied before export.

While revenues from the carbon fee would go toward a dividend, revenues from the carbon border fee adjustment would go toward administering the carbon border fee adjustment and to the Green Climate Fund.

MARKET CHOICE ACT

The Modernizing America with Rebuilding to Kickstart the Economy of the Twenty-first Century with a Historic Infrastructure-Centered Expansion (MARKET CHOICE) Act would establish a carbon tax based on the carbon-dioxide-equivalent emissions from fossil-fuel combustion and certain industrial products and processes.

The Fitzpatrick proposal would impose a border tax adjustment on imports of covered goods. Covered goods are those from eligible industrial sectors (manufacturing sectors, metal ores, soda ash, and phosphate processors) and those with a greenhouse intensity of at least five percent and a trade intensity of at least 15 percent. Greenhouse gas intensity is calculated by dividing the product of the carbon dioxide equivalent emissions of an industrial sector and carbon tax rate by the value of the shipments for the sector. Trade intensity is calculated by dividing the value of the total imports and exports of the sector by the value of shipments plus the value of imports of the sector.

Importers of a covered good would pay a border tax adjustment equivalent to the cost of comparable domestic manufactured goods associated with the carbon tax.

U.S. exporters of a covered good would receive a rebate based on the carbon tax paid before export.

AMERICA WINS ACT

The America Wins Act would establish a carbon fee based on the carbon dioxide content of fossil fuels.

The Larson proposal would impose a border adjustment on imports of carbon-intensive goods. Carbon-intensive goods are primary products or manufactured items with one or more primary products as inputs and where the cost of production is significantly increased due to the carbon tax.

Importers of a carbon-intensive good would pay a border adjustment equivalent to the cost domestic producers pay for manufacturing comparable goods subject to the carbon fee.

U.S. exporters of carbon-intensive goods would receive a credit or refund (without interest) based on the carbon fee levied before export.

The border adjustment expires when: an international climate agreement with equivalent measures comes into effect, when exporting countries adopt equivalent measures, or when it is deemed no longer necessary. Least developed countries or any country determined to be responsible for less than 0.5 percent of total greenhouse gas emissions and less than five percent of global production in the eligible industrial sectors are exempt from the border adjustment.

SAVE OUR FUTURE ACT

The Save Our Future Act would establish fees on air pollution. The fees are based on carbon dioxide emissions from fossil fuel (e.g., coal, petroleum, natural gas) products, fluorinated gases, methane emissions from the fossil fuel supply chain, non-fossil fuel-related greenhouse emissions from large industrial facilities, sulfur oxide, oxides of nitrogen, and PM2.5.

The Whitehouse-Schatz proposal would impose a border adjustment on energy-intensive manufactured goods. Energy-intensive manufactured goods are manufactured goods where energy costs make up at least five percent of the cost as determined by the Treasury Secretary.

Importers of energy-intensive manufactured goods would pay a border adjustment equivalent to any fees that would be imposed on the good if it were manufactured domestically multiplied by a carbon intensity metric (i.e., the ratio between the economy-wide carbon intensity in the exporting country and the U.S. economy-wide carbon intensity). Where reliable data is available, the fee can be equivalent to fees that would be imposed on the good if it were manufactured domestically multiplied by the firm-specific carbon intensity. The import fee could be reduced by the costs associated with a carbon price imposed on the good by the exporting country

U.S. exporters of energy-intensive goods would receive a credit or refund based on the average fee levied on domestic manufacturers.

FAIR ACT

The Fair, Affordable, Innovative, and Resilient (FAIR) Transition and Competition Act would impose a border carbon adjustment based on domestic environmental costs incurred in the production of a covered good or fuel. Federal agencies would determine the domestic environmental cost based on the average cost incurred by domestic companies to comply with any federal, state, regional, or local law, regulation, policy, or program that is designed to reduce emissions.

Covered goods would initially include steel, aluminum, cement, iron, and any product where the majority of its composition includes the aforementioned goods, as well as other goods as determined by the Treasury Secretary. Covered fuels include fossil fuels (e.g., natural gas, oil, coal) that are used to emit greenhouse gases into the atmosphere.

Importers of covered goods would pay a border carbon adjustment fee based on three criteria. For covered fuels, the fee would be equivalent to the domestic environmental cost multiplied by the upstream greenhouse gas emissions of the fuel (i.e., emission from the extraction, processing, transportation, financing, or other preparation of a covered fuel determined via rulemaking). For a product manufactured within a sector that is not a covered fuel, the fee would be equivalent to the domestic environmental cost multiplied by the production greenhouse gas emissions of the product (i.e., emissions from the production, manufacture, or assembly of a product determined via rulemaking). For

products produced within a sector where reliable data is not available, the fee would be equivalent to the domestic environmental cost multiplied by an emissions-intensity benchmark for the sector based on the highest-emitting domestic producers.

The Coons-Peters proposal would exempt least-developed countries and does not exempt countries that impose a border adjustment on U.S. produced or manufactured goods. The proposal also requires the Secretary of State and the U.S. Trade Representative to engage with trading partners on reducing greenhouse gas emissions.

Revenues from the border adjustment would be used to provide resilient community grants to states to equitably assist vulnerable communities and give transition assistance, as well as support the research, development, and deployment of emissions reduction technologies.

CLEAN COMPETITION ACT

The Clean Competition Act would impose a "carbon intensity charge" on covered primary goods and imported finished goods that would mirror a domestic performance standard on primary goods.

The Whitehouse proposal would cover domestically produced and imported primary goods from 19 energy-intensive industrial sectors (e.g., fossil fuels, iron, steel, aluminum, cement, glass, pulp and paper, and chemicals).

Starting in 2024, importers of primary goods would pay a carbon intensity charge relative to a benchmark based on the performance of U.S. producers in the same sector. The benchmark would be developed based on average performance of producers across their scope 1 and 2 emissions. U.S. primary good producers and importers would pay for emissions per metric ton that exceed the benchmark. For importers, the charge would be based on the ratio between the economy-wide emissions intensity in the country of origin and U.S. economy-wide emissions intensity multiplied by the sectoral benchmark. However, if the Treasury Department determines emissions data is reliable and transparent in the country of origin, and if the country is a transparent market economy where evasion of the import fee (i.e., resource shuffling[22]) is less likely, then the charge can be based on the difference between the U.S. sectoral benchmark and the average sectoral performance in the exporting country or at a company level. The proposal would exempt least-developed countries.

For domestic producers of primary goods, the charge would be based on the difference between the facility carbon intensity and the U.S. sectoral benchmark. If the domestic producers and imported good's emissions exceed the U.S. sectoral benchmark, they would pay the difference multiplied by an annual carbon price.

The U.S. sectoral benchmarks would decrease by 2.5 percent per year from 2025 to 2028 and then 5 percent per year thereafter from the initial sectoral average, meaning both domestic producers and importers would face escalating costs unless they can reduce emissions at the same pace. Effectively both U.S. producers and importers would have to pay for all of their covered emissions in 23 years.

Starting in 2026, importers of finished goods containing at least 500 pounds of covered primary goods would pay a border adjustment equal to the amount of primary good multiplied by the total weight of the applicable primary good and the carbon price. Starting in 2028, the threshold for coverage drops to 100 pounds.

The carbon price starts at $55 in 2024 and increases five percent plus inflation annually.

U.S. exporters of covered primary goods that was subject to the carbon intensity charge would receive a refund based on the U.S. sectoral carbon intensity.

Revenues from the carbon intensity charge would be split among two categories. Three-quarters of the revenues would fund a competitive grant program for covered industrial sectors to help them invest in new technologies that reduce their carbon intensities or build new eligible facilities that will have best-in-class carbon intensities. The remaining 25 percent would go to the State Department to support climate activities.

ENDNOTES

1 Carbon Pricing Leadership Coalition, *Report of the High-Level Commission on Carbon Pricing and Competitiveness* (Washington, DC: The World Bank, 2019), https://openknowledge.worldbank.org/bitstream/handle/10986/32419/141917.pdf.

2 Joe Aldy and Billy Pizer, *The Competitiveness Impacts of Climate Change Mitigation Policies*, Discussion Paper 15–73 (Cambridge, MA: Harvard Project on Climate Agreements, 2015), https://www.belfercenter.org/sites/default/files/legacy/files/dp73_aldy-pizer.pdf.

3 Florian Misch and Philippe Wingender, *Revisiting Carbon Leakage* (Washington, DC: International Monetary Fund, 2021), https://www.imf.org/en/Publications/WP/Issues/2021/08/06/Revisiting-Carbon-Leakage-462148.

4 "The General Agreement on Tariffs and Trade (GATT 1947)," World Trade Organization, accessed May 6, 2022, https://www.wto.org/english/docs_e/legal_e/gatt47_02_e.htm#articleXX.

5 United Nations, *United Nationals Framework Convention on Climate Change*, FCCC/INFORMAL/84 (New York, United Nations, 1992), https://unfccc.int/resource/docs/convkp/conveng.pdf.

6 For Canada's request of information, see: "Consultation on border carbon adjustments," Government of Canada, last modified February 1, 2022, https://www.canada.ca/en/department-finance/programs/consultations/2021/border-carbon-adjustments.html. For UK's inquiry, see "EAC launches new inquiry weighing up carbon border tax measures," UK Parliament, last modified September 24, 2021, https://committees.parliament.uk/work/1535/carbon-border-adjustment-mechanisms/news/157728/eac-launches-new-inquiry-weighing-up-carbon-border-tax-measures; See also *Environmental Audit Committee, Greening imports: a UK carbon border approach*, HC 737 (London: UK: House of Commons, 2022), https://committees.parliament.uk/publications/9570/documents/162115/default. For California's mechanism, see: Meredith Fowlie, Claire Petersen, and Mar Reguant, *Border Carbon Adjustments When Carbon Intensity Varies Across Producers: Evidence from California*, American Economic Association Papers and Proceedings, 111: 401-05 (Berkely, CA: Energy Institute at Haas, 2021), https://haas.berkeley.edu/wp-content/uploads/WP321.pdf.

7 "G7 Finance Ministers and Central Bank Governors´ Petersberg Communiqué," The Press and Information Office of the Federal Government, May 20, 2022, https://www.bundesregierung.de/resource/blob/998440/2042892/0e49b3d6176a9c79de0a27ab1d6d2b15/2022-05-20-g7-finanzminister-en-data.pdf.

8 "Joint Statement issued at the BRICS High-level Meeting on Climate Change," Ministry of Ecology and Environment of the People's Republic of China, last modified May 15, 2022, https://www.mee.gov.cn/ywdt/hjywnews/202205/t20220515_982106.shtml.

9 "Regulation of the European Parliament and the Council establishing a carbon border adjustment mechanism," European Commission, July 14, 2021, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021PC0564.

10 Kevin Cramer and H.R. McMaster, "Use Climate and Trade Policy to Counter Putin's Playbook," *Foreign Policy*, December 23, 2021, https://foreignpolicy.com/2021/12/23/russia-energy-us-europe-carbon-tarriff-ukraine-nordstream-oil-gas.

11 Nick Sobczyk, "Carbon border fee gains traction, but hurdles remain," *E&E Daily*, May 4, 2022, https://www.eenews.net/articles/carbon-border-fee-gains-traction-but-hurdles-remain.

12 Rachel Fefer et al., *Section 232 Investigations: Overview and Issues for Congress*, R45249 (Washington, DC: Congressional Research Service, 2021), https://crsreports.congress.gov/product/pdf/R/R45249.

13 "U.S.-Japan Joint Statement," U.S. Department of Commerce, February 7, 2022, https://www.commerce.gov/sites/default/files/2022-02/US-Japan-Joint-Statement.pdf. See also "Tai, Raimondo Statements on 232 Tariff Agreement with United Kingdom," U.S. Trade Representative, March 22, 2022, https://ustr.gov/about-us/policy-offices/press-office/

press-releases/2022/march/tai-raimondo-statements-232-tariff-agreement-united-kingdom.

14 "FACT SHEET: The United States and European Union To Negotiate World's First Carbon-Based Sectoral Arrangement on Steel and Aluminum Trade," The White House, last modified October 31, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/10/31/fact-sheet-the-united-states-and-european-union-to-negotiate-worlds-first-carbon-based-sectoral-arrangement-on-steel-and-aluminum-trade.

15 "U.S-Japan Joint Statement," U.S. Department of Commerce, last modified February 7, 2022, https://www.commerce.gov/sites/default/files/2022-02/US-Japan-Joint-Statement.pdf.

16 *Combatting Climate Change in East Asia and the Pacific*, 117th Congress (2021) (Dr. Johnathan Perishing, Senior Advisor to the Special Presidential Envoy for Climate, Office of the Special Presidential Envoy for Climate Change), https://www.foreign.senate.gov/hearings/combatting-climate-change-in-east-asia-and-the-pacific-072121. See also Zack Colman, "White House official outlines strategy to avoid carbon tariff trade war with EU," *PoliticoPro*, December 1, 2021.

17 Sierra Club, *Carbon Dumping Fees: A Tool to Close the Climate Loophole* (Oakland, CA: Sierra Club, 2021), https://www.sierraclub.org/sites/www.sierraclub.org/files/carbon-dumping-fee-climate-trade.pdf.

18 Raymond Kopp, William Pizer, and Kevin Rennert, *Industrial Decarbonization and Competitiveness: A Domestic Benchmark Intensity Approach* (Washington, DC: Resources for the Future, 2022), https://www.rff.org/publications/issue-briefs/industrial-decarbonization-and-competitiveness-a-domestic-benchmark-intensity-approach.

19 EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020*, EPA 430-R-22-003 (Washington, DC: U.S. Environmental Protection Agency, 2022), https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emission-sand-sinks-1990-2020.

20 Gabriel Weil and Shayla Ragimov, "Next Up for Carbon Accounting: 'Cradle-to-Border' Emissions," Climate Leadership Council, last modified June 2, 2022, https://clcouncil.org/blog/next-up-for-carbon-accounting-cradle-to-border-emissions.

21 Jason Ye, *Carbon Pricing Proposals in the 117th Congress* (Arlington, VA: Center for Climate and Energy Solutions, 2021), https://www.c2es.org/document/carbon-pricing-proposals-in-the-117th-congress.

22 Resource shuffling refers to an effort to reallocate production to reduce exposure to a border adjustment or other climate policy without reducing emissions overall. For instance, a firm that makes aluminum via both hydropower and fossil fuels could export the cleaner, hydropower-produced goods to the country imposing a border adjustment while selling the dirtier goods in markets without border adjustments.

C2ES CENTER FOR CLIMATE AND ENERGY SOLUTIONS

The Center for Climate and Energy Solutions (C2ES) is an independent, nonpartisan, nonprofit organization working to forge practical solutions to climate change. We advance strong policy and action to reduce greenhouse gas emissions, promote clean energy, and strengthen resilience to climate impacts.

3100 CLARENDON BLVD. SUITE 800 ARLINGTON, VA 22201 703-516-4146 **C2ES.ORG**