



# **The Carbon Club revisited**

## **Harnessing enterprise and trade to decarbonise the global economy**

**Bethan Adams, Kaya Axelsson, Adam Parr**

**02 February 2022**

Oxford Smith School of Enterprise and the Environment | **Working Paper No. 22-01**



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**Suggested citation:** Adams, B., Axelsson K., Parr, A. (2022). The Carbon Club revisited: Harnessing enterprise and trade to decarbonise the global economy.

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## Harnessing enterprise and trade to decarbonise the global economy

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## 1. Key points

A Border Carbon Adjustment (BCA):<sup>1</sup>

- Addresses a major source of emissions: those embedded in a nation's imports.
- Provides a financial incentive to overseas producers to invest in low emission technology.
- Reduces carbon leakage and ensures fair competition for domestic producers reducing their own emissions.
- Incentivises citizens to choose lower carbon products.
- Uses implementation and enforcement mechanisms that are already universally practised.
- Requires no international negotiations, but is aligned with the direction of travel towards climate ambition in the EU and elsewhere.
- Is seen as a fair policy across the political spectrum in key countries proposing it.
- Raises funds that can be used to promote a just transition: at home, alleviating any impact from higher prices; and internationally, providing climate finance for adaptation and mitigation among affected nations.

**A Carbon Club of those considering a BCA including the EU, the UK, Canada, Japan, and the US would cover 44% of global international trade.**

## 2. Introduction – A Carbon Club

The IMF has promoted a carbon tax as the “single most powerful” way to combat climate change.<sup>2</sup> In 2019, they reported that in order to limit global warming to 2 degrees or below, “large emitting countries should take ambitious action equivalent to a carbon tax set to rise quickly to \$75 a ton in 2030.”<sup>3</sup> Whilst the global average carbon price is currently only \$2 a ton,<sup>4</sup> several governments have already committed to steep increases in carbon pricing: Canada's price is set to increase from C\$30 to \$170 per tonne of CO<sub>2</sub> by 2030, and Norway

<sup>1</sup> We have standardised on the term Border Carbon Adjustment, abbreviated as BCA. There are two major alternative English names for the same concept: border carbon tax; and carbon border adjustment mechanism (CBAM), the term used by the European Union. In French the term is Mécanisme d'ajustement carbone aux frontières.

<sup>2</sup> Newburger (2019) [A carbon tax is “single most powerful” way to combat climate change.](#)

<sup>3</sup> Gaspar et al., (2019) [Fiscal Policies to Curb Climate Change.](#)

<sup>4</sup> Gaspar et al., (2019) [Fiscal Policies to Curb Climate Change.](#)

is aiming for \$230 by the same year.<sup>5</sup> However, with this disparity in ambition comes an increased risk of ‘carbon leakage’. Carbon leakage is defined by the European Commission as occurring if “for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions.”<sup>6</sup> This not only reduces the effectiveness of carbon pricing, but disadvantages domestic industries which have to pay higher prices than importing producers<sup>7</sup>. A BCA addresses these risks by placing a tax on imported products based on their embedded emissions. We propose that, in order to maximise emissions reduction, BCAs are unilaterally implemented by individual nations as part of a growing ‘Carbon Club’.

The idea of a Carbon Club of nations each implementing a BCA – or, as William Nordhaus described it – a ‘climate club’, responds to the concern that multilateral, voluntary agreements to reduce emissions can induce free-riding, whereby “countries have an incentive to rely on the emission reductions of others without making costly domestic reductions themselves.”<sup>8</sup> We define a Carbon Club as a group of countries who unilaterally and sequentially<sup>9</sup> introduce a BCA on their imported goods. Thus a Carbon Club entails a set of parallel unilateral measures – not a single negotiated arrangement. From a game theoretic perspective, the more countries join the Club, the more of an incentive there is to do so<sup>10</sup>. Several of the most import-heavy nations are seriously considering joining a Carbon Club including the United Kingdom, the United States, the European Union, Canada and Japan. Such a Carbon Club would represent 44 percent of the world’s annual imports. These nations’ combined annual merchandise imports represented \$6.6 trillion out of the total \$15 trillion in 2020.<sup>11</sup> Together, this Club represents significant buying power, and while their BCAs may be unlikely to cover all products from the start, the advent of such a Club would

<sup>5</sup> Sandbu (2021) [Time is ripe for EU to start a carbon club](#).

<sup>6</sup> European Commission (2021) [Carbon leakage](#).

<sup>7</sup> Lydgate (2021) [The Carbon Border Adjustment Trilemma](#).

<sup>8</sup> Nordhaus (2020) [The Climate Club](#).

<sup>9</sup> Helm et al. (2012) [Trade, climate change, and the political game theory of border carbon adjustments](#)

<sup>10</sup> Helm et al. (2012) [Trade, climate change, and the political game theory of border carbon adjustments](#)

<sup>11</sup> World Trade Organisation (2020) [World Trade Statistical Review 2020](#), Table A7. This excludes trade in services, and trade between EU countries.

send a compelling trade signal to accelerate global decarbonisation, one which would be felt strongly by exporting nations representing some of the most emissions-intensive industries.

Absent of a Club, there remain many reasons for nations and regions to implement BCAs independently of one another, including maintaining the competitiveness of domestic industries, reducing their total emissions, and raising revenues in support of a transitioning economy. As the industries of major nations slash emissions, so too will they lose revenues from their own fuel taxes, a loss which may be temporarily balanced by a BCA as other nations and export industries catch up on the decarbonisation timeline. More immediately, it may be timely for nations to implement these mechanisms as part of their Covid recovery plans. The European Union's proposed BCA was motivated in part to address the need to raise funds to pay for a green COVID recovery,<sup>12</sup> and it is expected to reach €9.1 billion a year by 2030.<sup>13</sup>

There are several considerations to take into account in the design of a BCA, including the treatment of imports and exports, the industries and countries covered by the tax, and the measurement of emissions. BCAs can take one of three forms: "(i) border taxes (as tariffs on imports and, less commonly, rebates on exports); (ii) mandatory emissions allowance purchased by importers; and (iii) embedded carbon product standards. In each case, the objective has traditionally been to extend a domestic carbon pricing scheme to traded goods."<sup>14</sup>

Importantly, BCAs can be implemented without formal multilateral negotiations, immediately, by individual nations, to give shareholders of the world's corporations clear financial incentives to invest in low carbon technology.<sup>15</sup> This applies to the producers of raw

<sup>12</sup>European Commission (2021) [Proposal for a regulation of the European Parliament and of the Council establishing a carbon border adjustment mechanism](#). See: Abnett & Twidale (2021) [EU proposes world's first carbon border tax for some imports](#).

<sup>13</sup>Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests](#).

<sup>14</sup>Wooders et al., cited in Helm et al. (2012) [Trade, climate change, and the political game theory of border carbon adjustments](#), p.369.

<sup>15</sup>Harvey (2021) [Regulate business to tackle climate crisis, urges Mark Carney](#). "He said for the world to meet its climate goals, governments would have to force industries to follow clear rules, on everything from energy generation to construction and transport, and set carbon prices that would drive investment towards green ends and close down fossil fuels. "We need clear, credible and predictable regulation from government," he said. "Air quality rules, building codes, that type of strong

materials such as steel and cement, but also finished goods from cars to mobile phones. Industries such as steel and cement, despite having spent very little on low-carbon investments so far, are in a strong position to contribute to clean research and innovation,<sup>16</sup> and a BCA could promote cooperative sectoral agreements and collaboration on how best to address hard-to-abate sectors.<sup>17</sup> Critically, BCAs also need to be extended to agricultural products which represent a quarter of global GHG emissions. Beef, for example, has emissions of 46kg CO<sub>2</sub>e for one kilogram by carcass weight.<sup>18</sup> A kilogram of steel averages less than 2kg of CO<sub>2</sub>e.<sup>19</sup> Emissions associated with steel production are some 2.6 billion tonnes a year,<sup>20</sup> while emissions from beef production are about 4.6 billion tonnes, and all livestock about 7.1 billion.<sup>21</sup> A cascade of BCAs by proposing members of the Carbon Club could provide the fundamental kick to key markets, needed to drive emissions down in order to meet the temperature goals of the Paris Agreement.

regulation is needed. You can have strong regulation for the future, then the financial market will start investing today, for that future. Because that's what markets do, they always look forward."

Harvey, F. (2021) ["Put a big fat price on carbon": OECD chief bows out with climate rally cry.](#)

<sup>16</sup> Carbon Market Watch (2021) [The Phantom Leakage.](#)

<sup>17</sup> Stam & Moscovenko (2020) [EU carbon border tax](#); Gore et al. (2021) [What Can Least Developed Countries and Other Climate Vulnerable Countries Expect from The EU Carbon Border Adjustment Mechanism \(CBAM\)?](#)

<sup>18</sup> Gerber et al. (2013) [Tackling climate change through livestock](#), p. 23.

<sup>19</sup> Hoffmann et al. (2020) [Decarbonization challenge for steel](#), p. 1.

<sup>20</sup> IEA (2020) [Direct CO<sub>2</sub> emissions in the iron and steel sector by scenario, 2019-2050.](#)

<sup>21</sup> Gerber et al. (2013) [Tackling climate change through livestock](#), p. 15.

## 2. Harnessing the power of trade

This section considers trade into the US, EU and UK from high emitting countries. Among the latter, Canada and Japan are also potential members of a Carbon Club. The 14 largest emitters outside the US, UK and EU are Australia, Brazil, Canada, China, India, Indonesia, Iran, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea and Turkey.

Collectively they are responsible for some 26.5 billion tonnes CO<sub>2</sub>e of emissions. They are also major exporters, with China alone exporting an estimated US\$1 trillion to the US, EU and UK each year.

	China	Other top 14
Emissions (billion tonnes CO <sub>2</sub> e)	11.7	14.8
Exports to US, UK and EU (US\$ billion)	1.0	1.6
Total exports (US\$ billion)	2.2	3.9
<i>US, UK and EU exports as a % of total exports</i>	<i>45%</i>	<i>40%</i>
GDP (US\$ billion)	12.2	20.2
<i>US, UK and EU exports as a % of GDP</i>	<i>8%</i>	<i>8%</i>

Source: authors' estimates (for 2019)

Of course, any other country, including those listed above, would make an encouraging contribution to the Carbon Club, both by introducing a domestic carbon price, and a BCA. Canada and Japan are already contemplating such a move.

The following sections outline the support for a BCA in different members of a potential Carbon Club: the UK, the US, Canada, the EU, and Japan. The EU has already proposed their plans for a BCA, and other members appear ready to follow in their footsteps. However, no country need delay its own plans to wait for others to introduce a BCA: and action by any major economy to introduce one will stimulate others to do so.



Emissions embedded in the EU’s imports have been rising, and currently represent 20% of the EU’s domestic CO<sub>2</sub> emissions.<sup>22</sup> The table below represents the emissions embedded in the imports of the other four proposed Carbon Club members. This amounts to a total of 716MtCO<sub>2</sub> that could be addressed by the introduction of BCAs across the Club.

Carbon Club member	Mt CO <sub>2</sub> in imported goods	As a % of domestic emissions
USA	352Mt CO <sub>2</sub>	6%
Japan	180Mt CO <sub>2</sub>	14%
UK	158Mt CO <sub>2</sub>	36%
Canada	26Mt CO <sub>2</sub>	4%

Source: Hausfather (2017) [Mapped: The world’s largest CO<sub>2</sub> importers and exporters.](#)

### 3. The United Kingdom

In September 2021, the Environmental Audit Committee (EAC) launched an inquiry into the impacts, risks, and opportunities of a BCA in the UK,<sup>23</sup> including its ability to address carbon leakage and achieve the UK’s environmental goals, in order to make recommendations to the Government on the possibility of introducing a unilateral BCA.<sup>24</sup> The Chairman of the Committee, Rt Hon Philip Dunne MP, noted that “the Government appears to be in listening mode on the merits of CBAMs”, and that carbon leakage could represent “a glaring loophole for Net Zero Britain, through which many highly skilled jobs might be lost, damaging local economies.”<sup>25</sup> This follows reports of the effects of carbon leakage on the UK’s steel and motor manufacturing sectors.<sup>26</sup> The CCC reported that the current system of free ETS allowances for manufacturers at risk of carbon leakage is unlikely to incentivise deep decarbonisation and may not be the most efficient way to avoid carbon leakage,<sup>27</sup> proposing

<sup>22</sup> European Parliament (2021) [A WTO-compatible EU carbon border adjustment mechanism.](#)

<sup>23</sup> Hedley et al. (2021) [UK plans carbon border adjustment mechanism.](#)

<sup>24</sup> UK Parliament (2021) [Call for Evidence: Carbon border adjustment mechanism](#)

<sup>25</sup> UK Parliament (2021) [EAC launches new inquiry weighing up carbon border tax measures](#)

<sup>26</sup> Environmental Audit Committee (2021) [Growing back better: putting nature and net zero at the heart of the economic recovery](#), 134-135.

<sup>27</sup> Climate Change Committee (2020) [Policies for the Sixth Carbon Budget and Net Zero](#), p.102



the introduction of either border carbon tariffs or minimum standards to imports of selected emissions-intensive products. The CCC's proposal is accompanied by three target areas for the Government to create favourable conditions for the introduction of border carbon tariffs or minimum standards: developing carbon intensity measurement standards for selected industries by working with key sectors and the international community; mandating disclosure of the carbon intensity of selected industrial products and processes by the mid-2020s; and fostering international consensus on carbon border policies for traded products, including by engaging with the WTO to ensure compliance.<sup>28</sup> The UK Board of Trade stated that "Since carbon leakage is mainly a forward-looking risk, there is time to design an effective policy solution with other countries that seeks to address it."<sup>29</sup>

However, from the perspective of rising cumulative emissions, there is little time to waste in implementing mechanisms like a BCA, as the UK and the world eats up a limited carbon budget. A BCA on imported energy for the UK would help to address some of the nation's most significant hidden emissions. According to a report by the Center for Policy Studies, "the UK imports six times more electricity than it exports, and is increasingly reliant on power delivered via undersea interconnectors. Yet the same carbon levies are not applied."<sup>30</sup> This means that even as the UK slashes coal use and reduces fossil fuel dependency domestically, it continues to import energy from carbon-intensive sources abroad. A BCA would address this.

When a country imports goods from another, it has the right to set the standards it wants from its suppliers. The United Kingdom has, for example, established the Modern Slavery Act 2015 to require businesses to eliminate slavery from their supply chains. While slavery exists in the UK, it is in the production of the textiles, food, and other goods and materials that the UK imports that modern slavery is most prevalent. Evidently, it would be immoral for British companies and citizens to accept this just because the criminal activity occurs outside its borders.

<sup>28</sup> Climate Change Committee (2020) [Policies for the Sixth Carbon Budget and Net Zero](#), p.104

<sup>29</sup> UK Board of Trade (2021) [Green Trade: A Board of Trade Report](#)

<sup>30</sup> Lodge (2020) [Carbon Border Tax would stop Britain hiding its true carbon emissions.](#)

By analogy, nearly half of the UK’s carbon footprint is embedded in goods and materials from overseas which are imported into the UK, as shown in the table below.

Source of emissions	mt CO <sub>2</sub> e	As a %
Imports used by UK business for consumption by UK consumers	302	43%
UK production emissions attributable to UK final consumption	255	36%
Households heating emissions from fossil fuels	79	11%
Transport emissions generated by households	67	10%
<b>Total</b>	<b>703</b>	<b>100%</b>

Source: UK Department for Environment, Food and Rural Affairs, 2018

#### 4. The United States

The idea of a Carbon Club in the United States has benefited from strong strategic support across parties, with Republican promoters, James Baker III and George Schultz, outlining the measure as a key strategic initiative for the US.<sup>31</sup> The Baker-Schultz plan is now being promoted by the non-partisan Climate Leadership Council.<sup>32</sup> John Kerry, US envoy on climate, stated in 2021 that Joe Biden, US president, was “interested in evaluating the border adjustment mechanism.”<sup>33</sup> In the 2021 Trade Policy Agenda, the Biden Administration stated that they would “work with allies and partners that are committed to fighting climate change” by “exploring and developing market and regulatory approaches to address greenhouse gas emissions in the global trading system”, which included a “consideration of carbon border adjustments.”<sup>34</sup> California already has its own BCA on electricity imports, demonstrating the potential for subnational adoption across the federal system of the US.<sup>35</sup>

Cross-party support in the US for a BCA may be attributable to the fact that it is seen as creating a fair playing-field for domestic industries. Recent polling by Moore Information

<sup>31</sup> Baker et al. (2020) *The Strategic Case for US Climate Leadership*.

<sup>32</sup> Climate Leadership Council (2022) [The Four Pillars of the Carbon Dividends Plan](#).

<sup>33</sup> Parker et al. (2021) [Tory pressure mounts for cross-border carbon levy](#).

<sup>34</sup> United States Trade Representative (2021) [Trade Policy Agenda and 2020 Annual Report](#), p.3

<sup>35</sup> McWilliams & Tagliapietra (2021) [Carbon border adjustment in the United States: not easy, but not impossible either](#).



Group and BGAO for the Climate Leadership Council found that 80% or more agreed with the following statements:

- Any U.S. climate action policy needs to ensure other countries do their part to reduce carbon pollution.
- Any U.S. climate action policy should be designed to reward efficient U.S. manufacturers and penalise high carbon polluting imports.
- When it comes to trade, we should enact policies that discourage products made with higher carbon pollution and incentivise products made in America with less carbon pollution.
- To be effective, any national climate solution must hold other major emitters like China, Russia and India accountable for their carbon pollution.

Notably the study found that US battleground state voters would back a candidate who backs a BCA: “approximately two-in-three voters in each of the five Battleground states are more likely to vote for a candidate who supports a BCA. This includes majorities of Democrats, Independents and Republicans, in nearly all cases. Pennsylvania Republicans are the exception, but still, a plurality there would be more likely to vote for a pro-BCA candidate.”<sup>36</sup>

One potential hurdle for the adoption of a BCA in the US is that the country has, as of yet, failed to set a domestic carbon price. This could put the nation in a difficult position with the WTO in setting a BCA. That said, by the time a WTO ruling may come down on the policy, a BCA will have already likely had significant impact. In addition, one main objection to a domestic carbon price is its effect on the competitiveness of American business. Once a BCA is in place, this argument falls away. The announcement of a BCA could demonstrate good faith to US business and possibly ease political resistance to an internal carbon price.

<sup>36</sup> Iverson & Agne (2021) [Border Carbon Adjustment Battleground Survey Results](#).

## 5. Canada

In Autumn 2020, the Canadian government announced that they would explore how BCAs could contribute to Canada's transition to a low carbon economy in a way that "is fair and predictable for Canadian firms and consumers, and that supports Canada's international competitiveness."<sup>37</sup> In 2021, the government launched a Consultation on Border Carbon Adjustments, seeking to advance conversations about BCAs with citizens and international partners.

The government considers BCAs as an effective way of addressing disparities in climate action in a coordinated manner, to reduce GHG emissions at the same time as mitigating pressure on international trade and Canada's global competitiveness. Carbon pricing is a foundational pillar of the Government's strengthened climate plan,<sup>38</sup> which aims to achieve 40-45% emissions reduction by 2030 and net zero by 2050.

The Canadian government is taking an international approach to the introduction of BCAs, noting that "This is not an issue Canada can address alone. It will be important to pursue discussions with countries with ambitious climate policies, especially with key trading partners, as they confront the same challenges."<sup>39</sup> In the 2021 Budget the government suggested that "it would work with like-minded countries to consider how this approach could fit into a broader strategy to meet climate targets in a manner consistent with maintaining our competitiveness in a fair and open trading system."<sup>40</sup> The release of a Roadmap for a Renewed US-Canada Partnership,<sup>41</sup> signed by Trudeau and Biden in February 2021, recognises the need to "work together to protect businesses, workers and communities in both countries from unfair trade by countries failing to take strong climate action," amongst other measures to strengthen implementation of the Paris Agreement. Given the government's willingness to engage with international partners,<sup>42</sup> Canada could potentially be a central player in an international Carbon Club.

<sup>37</sup> Government of Canada (2021) [Exploring Border Carbon Adjustments for Canada](#).

<sup>38</sup> Government of Canada (2020) [A Healthy Environment and a Healthy Economy](#).

<sup>39</sup> Government of Canada (2021) [Exploring Border Carbon Adjustments for Canada](#).

<sup>40</sup> Government of Canada (2021) [Exploring Border Carbon Adjustments for Canada](#).

<sup>41</sup> The White House (2021) [Roadmap for a Renewed U.S.-Canada Partnership](#).

<sup>42</sup> "the Government wants to engage with key trading partners and other like-minded countries who are taking climate action to better understand their perspectives and plans for BCAs or alternative

## 6. The European Union

The EU's proposal for a BCA in July 2021 represents the most significant step towards an international Carbon Club.<sup>43</sup> The proposal is part of the EU's *Fit for 55* package,<sup>44</sup> which aims to reduce emissions by 55% by 2030. It seeks to address carbon leakage and “ensure a level playing field between EU and non-EU businesses,” by aligning the carbon taxes placed on goods imported from outside the EU with those produced within the EU and taxed under the current ETS.<sup>45</sup> During the transitional period (2023-25), importers will be required to report the emissions embedded in their goods, but will not have to pay an adjustment. When the BCA becomes fully operational in 2026, EU importers must declare each year the emissions embedded in their goods, and surrender the corresponding number of certificates. If they can prove that a carbon price has already been paid during the production of the imported goods, this amount can be deducted. The proposal covers key industries with high carbon emissions at high risk of carbon leakage, including iron, steel, cement, and electricity generation.<sup>46</sup>

Emissions embedded in the EU's imports have been rising, and currently represent 20% of the EU's domestic CO<sub>2</sub> emissions.<sup>47</sup> Although it is unclear how much of this is a result of carbon leakage, this is predicted to increase as ETS allowances are reduced.<sup>48</sup> A report by UNCTAD found that a BCA of \$44 per tonne CO<sub>2</sub>, applied to the imports of power and energy intensive industries in the EU, leads to a net decrease of 27 MtCO<sub>2</sub> in emissions, a reduction of 0.1% of global CO<sub>2</sub> emissions and 0.9% of the EU's emissions.<sup>49</sup> In this case, the BCA allowed the leakage rate to be reduced from 13.3% to 5.2%. A higher BCA of \$88 per tonne CO<sub>2</sub> reduces global CO<sub>2</sub> emissions by 45 MtCO<sub>2</sub>. Additionally, the EU's BCA is expected to raise €9.1bn per year by 2030, the revenues of which, under the current proposal, will contribute to the EU's budget. This has sparked important conversations about how BCAs could be made more fair and effective, particularly with respect to international equity, with calls to reallocate some of the revenue to invest in international climate finance,

measures and ensure there as much coherence and coordination as possible among different policies and approaches.” Government of Canada (2021) [Exploring Border Carbon Adjustments for Canada](#).

<sup>43</sup> European Commission (2021) [Carbon Border Adjustment Mechanism](#).

<sup>44</sup> European Council (2021) [Fit for 55](#).

<sup>45</sup> European Commission (2021) [Carbon Border Adjustment Mechanism](#).

<sup>46</sup> European Commission (2021) [Carbon Border Adjustment Mechanism](#).

<sup>47</sup> European Parliament (2021) [A WTO-compatible EU carbon border adjustment mechanism](#)

<sup>48</sup> Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests](#).

<sup>49</sup> UNCTAD (2021) [A European Union Carbon Border Adjustment Mechanism](#).

or to support companies in developing countries to green their production processes.<sup>50</sup> Others challenge the proposal for lack of ambition. The lessons learned over the following years of the EU's BCA will act as an important blueprint for the design of future BCAs.

## 7. Japan

Japan introduced a carbon price in 2012,<sup>51</sup> and the *Nikkei* newspaper reports that Japan is now considering a BCA that would “impose tariffs on imports from countries with insufficient environmental standards.”<sup>52</sup>

There has been much research on the potential impact of BCAs on Japanese trade and emissions. Different forms of BCA have all been shown to mitigate against welfare degradation, carbon leakage, and loss of competitiveness in emissions-intensive, trade-exposed (EITE) sectors.<sup>53</sup> A BCA based on a foreign emissions coefficient as opposed to a Japanese emissions coefficient is particularly effective at addressing carbon leakage,<sup>54</sup> as shown in the figure below. BCAs have a particularly significant impact on leakage rates to China, given that China accounts for the largest proportion of carbon leakage from Japan and is a key trading partner.

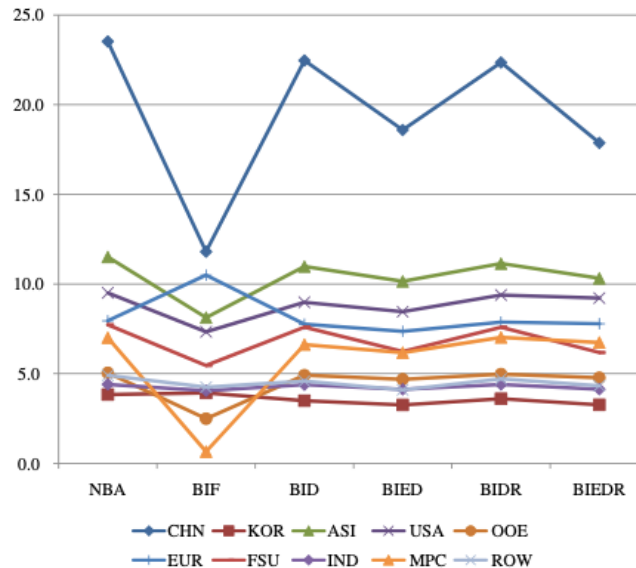
<sup>50</sup> European Parliament (2021) [Towards a WTO-compatible EU carbon border adjustment mechanism.](#)

<sup>51</sup> Zhou (2018) [Assessment of carbon pricing policy and border carbon adjustment in Japan.](#)

<sup>52</sup> Takezawa (2021) [Japan Mulls Carbon Border Tax for Polluters.](#)

<sup>53</sup> Takeda et al. (2012) [A computable general equilibrium analysis of border adjustments under the cap-and-trade system.](#)

<sup>54</sup> Arimura (2021) [Perspectives on Carbon Pricing & Carbon Border Adjustment Mechanism in Japan;](#) Takeda et al. (2012) [A computable general equilibrium analysis of border adjustments under the cap-and-trade system.](#)



Carbon leakage to other regions (MtCO<sub>2</sub>) under different BCA scenarios. 'NBA' represents carbon leakage with no BCA, 'BIF' represents a BCA based on a foreign emissions coefficient, and all other columns represent BCAs based on a Japanese emissions coefficient. Colours represent the effects on leakage for different countries or regions.<sup>55</sup>

In order to maximise emissions reduction, a carbon pricing framework in Japan, including a BCA, must be framed as a growth strategy that will strengthen industry and boost economic growth. The popularity of the framework will partly depend on how the tax revenue is used: whilst it is not a long-term revenue stream (revenues from a BCA should fall as international carbon targets are met), short-term revenues could be used to address the burden on low-income groups or to finance Covid-19 recovery.<sup>56</sup>

Japan is falling behind in its reputation as a low-carbon economy.<sup>57</sup> With renewed discussions over Japan's carbon pricing framework, expected to include carbon taxes, an emissions trading scheme, and subsidy programmes, and the close trade relationship following the 2020 signing of a free trade agreement between the UK and Japan, now looks to be a good time for Japan's integration into a Carbon Club.<sup>58</sup>

<sup>55</sup> Takeda et al. (2012) [A computable general equilibrium analysis of border adjustments under the cap-and-trade system.](#)

<sup>56</sup> Shigeki (2021) [Challenges of Carbon Border Adjustment.](#)

<sup>57</sup> Okazaki et al. (2021) [Japan begins discussions on carbon pricing framework.](#)

<sup>58</sup> British Embassy Tokyo (2020) [UK and Japan sign free trade agreement.](#)



## 8. Impact and difficulty

The concept of a BCA is consistent with research at the University of Oxford into disproportionately impactful actions on climate, called “Sensitive Intervention Points” (SIPs).<sup>59</sup> SIPs involve kicks and shifts: “Kicks push something at the verge of tipping in the system at just the right moment, while shifts change the underlying dynamics of the system.” The falling costs of renewable energy represent a shift, while a BCA would be a kick. They work to reinforce one another: lower renewable energy costs make it cheaper and easier for producers to decarbonise, while a BCA provides the financial incentive. The lower the cost of changing energy source, the more powerful the BCA will be.

Carbon pricing itself is not the mechanism by which decarbonisation is achieved but serves as a critical lever to accelerate the decarbonisation process. Decarbonisation must, by definition be physical or chemical, and two options stand out: replacing fossil fuels with other non-emitting energy sources – the main route to ending about 75% of emissions; and changing the way we farm and use land generally – the path to both reducing the remaining 25% of emissions, and actually pulling carbon out of the atmosphere and into soil and vegetation.<sup>60</sup> The role of a carbon price is to drastically accelerate the adoption of renewables and changes to agricultural practices. In this way it serves as one of the most powerful levers available to policymakers, one that nations are beginning to bring out of the box.

In spite of its potential scale and impact, imposing a BCA on imported goods is no more complicated than any other climate action, and much less complex than many. It has several advantages:

1. The main action required of government is simply to legislate.
2. The imposition of tariffs is a long-established activity of all governments.
3. Using tariffs (and taxes generally) as a way to influence investment and other decisions is well-established.

<sup>59</sup> Farmer et al. (2019) *Sensitive intervention points in the post-carbon transition*.

<sup>60</sup> US Environmental Protection Agency (2021) [Global Greenhouse Gas Emissions Data \(2019\)](#).

4. This is a unilateral action that requires no international collaboration.
5. It is a measure with bi-partisan support even in a country divided on climate change, as shown by the US research cited above.
6. The implementation of BCAs will necessitate the need for improvements in carbon accounting and visibility of carbon data across supply chains. To avoid paying default rates for embedded carbon in products which may be higher than the true value, export nations will be incentivised to invest in improved monitoring verification and reporting of carbon in their economies. BCAs can also be leveraged to support these processes in nations with low measurement capacity. If so, a knock-on impact could be broad improvement of accounting towards Nationally Determined Contributions.
7. For those countries that are pushing hard to decarbonise and achieve net zero, it creates a level playing-field for their domestic economy which might otherwise suffer from unfair competition by high-emission exporters. In other words, it is a *necessary* act to protect national interests.
8. Domestic businesses in the legislating country may have a marginal or even significant advantage as against importers because they are located closer to end-users and therefore have lower transportation-associated emissions. Localisation is beneficial for social as well as environmental reasons.
9. Similarly, the ability to generate low-emission renewable or nuclear energy is not a competitive advantage of exporting countries, whereas cheaper labour and less onerous regulation are. The USA, EU and UK have plentiful access to capital and to low-carbon energy which is all that is needed to decarbonise production. Thus, the importing blocs have nothing to fear competitively from carbon-pricing.
10. The tariffs can be introduced progressively, sending a clear signal to markets while allowing producers to adapt.
11. The financial incentive to invest now and avoid these progressive tariffs perfectly fits with the discounted cashflow/net present value method that companies use in their

decision-making. If there are lingering doubts, then these can be addressed through option valuation methods. Either way, decision-making is easy as it is purely financial.

12. Whatever businesses say to lobby against change, in practice they adapt rapidly once rules are clear and the playing-field is level.
13. Any cost to citizens caused by tariffs can be offset by the revenues generated being applied progressively to the more vulnerable.
14. Inevitably, those countries and companies that rely on the production and export of fossil fuels will have to adapt. They can either invest in carbon capture and storage, or develop new industries, such as in Queensland, Australia, with advances in green hydrogen.<sup>61</sup> This transition will no-doubt come with a cost (and long-term savings) underscoring the value of international climate financing as an outpost of the revenues raised through a BCA. It also helps if those countries proposing a BCA invest heavily in targeted programmes to drive green technologies down the cost curve and create an international market for these alternatives.

<sup>61</sup> Hosier (2021) [New \\$1 billion-plus project in Queensland to double world's green hydrogen production capacity.](#)

## Practical Impact - A Sectoral Example from the Steel Industry

The steel sector offers a good example of the potential impact of a BCA to drive the adoption of green alternatives in an important supply chain. About 28% of steel is produced in an electric arc furnace from scrap and other materials, the remaining 72% is produced in a blast furnace where iron ore and metallurgical coal are consumed. About 70% of emissions occur in the blast furnace process.<sup>62</sup> Australia is the largest producer of iron ore, almost all of which goes to China, Japan, South Korea and Taiwan who collectively produce 1.2 billion (63%) of world steel.<sup>63</sup> If we examine the supply chain from Australia to China, there are three ways in which this supply chain could be decarbonised: (1) Steelmakers in China can adopt new ironmaking technology using renewable energy; (2) Australia can produce 'green pig iron' produced with renewable energy as a feed for Chinese steel mills; or (3) Australia produces 'green steel' using renewable energy and sell it direct to steel consumers. Given that Australia has easier access to the vast amounts of renewable energy that would be needed to make green iron or steel at this scale, while China has lower costs of labour and all of the capital invested in its steelmaking facilities and distribution, the second of these pathways appears to offer the best response to a BCA on steel (although some in Australia are proposing the third).<sup>64</sup> Australia would produce pig iron using its plentiful resources of iron ore and renewable energy – and perhaps even hydrogen extracted from coal using carbon capture and sequestration; and China would import pig iron instead of coking coal and iron ore and produce steel products using renewable energy. There is no reason why either country's industry should suffer nor the flows of trade change fundamentally. On the positive side, both China and Australia move up the value curve; China improves air quality; and Australia's Scope 3 emissions from its valuable iron ore industry go to zero. Inevitably the costs of transition will trickle downstream, however, to put these costs into context, the cost of decarbonising steel production translates to about \$200 per vehicle, which is about 1% of the cost to buy one. If vehicle-buyers accepted that cost, it would generate \$20 billion a year of revenue (from annual sales of c. 100 million vehicles) to fund decarbonisation. Using reasonable rates of return that scale of revenue could fund \$500 billion – \$1 trillion of capital investment.

<sup>62</sup> Xu (2010) *Low carbon economy and iron and steel industry*.

<sup>63</sup> World Steel Association (2020) *Steel Statistical Yearbook 2020, Table 1*.

<sup>64</sup> Wood, T., Dundas, G., and Ha, J. (2020). *Start with steel*.

## 9. Managing the risks – Embedding international equity into BCA Design

As with any policy, tariff or tax, the design of a BCA needs to address issues of equity, leakage, coverage and unintended consequences.

First, A BCA may be challenged as breaching WTO Rules which aim to prevent discrimination between domestic and imported products, and between imported products from different WTO members.<sup>65</sup> Russia<sup>66</sup> and China<sup>67</sup> have claimed that the EU proposal violates WTO rules, despite the EU Commission's affirmation that it was developed in compliance.<sup>68</sup> So far, no carbon adjustment mechanisms have been challenged for violating WTO rules,<sup>69</sup> and with increasing international attention on the potential role of BCAs for climate mitigation, there is a growing body of research addressing the need to design BCAs in compliance with WTO rules.<sup>70</sup> GATT contains exemptions based on health and environmental reasons, and the WTO allows countries to introduce regulations to protect their people.<sup>71</sup> WTO issues often take years to resolve – as shown with the recent resolution of the 17-year Boeing-Airbus trade dispute between the US and the EU – likely much slower than the rate at which countries will move to implement a BCA.<sup>72</sup> With increasing support for BCAs from potential Carbon Club members, combined with the fact that the IMF and OECD have also shown support for carbon pricing mechanisms,<sup>73</sup> resistance from the WTO is likely to decline. Partnerships between countries within a Carbon Club could jointly advocate for reform of WTO rules to address the climate crisis and to allow greater flexibility for climate action without provoking international disputes, as recently proposed in relation to the US-UK Trade Partnership.<sup>74</sup>

<sup>65</sup> Morris & Nanda (2021) [Towards A Progressive US-UK Trade Partnership](#).

<sup>66</sup> Morgan (2020) [Russia warns EU against carbon border tax plan, citing WTO rules](#).

<sup>67</sup> Reuters (2021) [China says EU's planned carbon border tax violates trade principles](#).

<sup>68</sup> European Commission (2021) [Carbon Border Adjustment Mechanism](#).

<sup>69</sup> Orte Júlvez (2021) [EU Carbon Border Adjustment Mechanism Compliance With WTO Rules](#).

<sup>70</sup> See, for example, Mehling et al. (2019) [Designing Border Carbon Adjustments for Enhanced Climate Action](#); Pauwelyn & Kleimann (2020) [Trade Related Aspects of a Carbon Border Adjustment Mechanism. A Legal Assessment](#); and Hillman (2013) [Changing Climate for Carbon Taxes: Who's Afraid of the WTO?](#)

<sup>71</sup> Orte Júlvez (2021) [EU Carbon Border Adjustment Mechanism Compliance With WTO Rules](#).

<sup>72</sup> Amaro & Josephs (2021) [U.S. and EU resolve 17-year Boeing-Airbus trade dispute](#)

<sup>73</sup> European Commission (2021) [Carbon Border Adjustment Mechanism](#).

<sup>74</sup> Morris & Nanda (2021) [Towards A Progressive US-UK Trade Partnership](#).

Second, BCAs have been criticised from an international equity perspective given that they shift responsibility for decarbonisation onto climate vulnerable countries who may be less able to decarbonise without the financial and technical support to do so.<sup>75</sup> The EU's CBAM proposal has been criticised by the BASIC countries (Brazil, South Africa, India, and China)<sup>76</sup> for undermining the principle of 'common but differentiated responsibilities and respective capabilities' under the UNFCCC<sup>77</sup> and the 'nationally-determined' spirit of the Paris Agreement.<sup>78</sup> A BCA could have a significant impact on low-income economies that are heavily reliant on exporting energy-intensive products: for example, Mozambique is likely to be heavily affected by the EU's BCA, given that metal makes up 22% of Mozambique's exports, 87% of which goes to the EU.<sup>79</sup>

There are several possible approaches for addressing international equity risks alongside WTO arguments, including exemptions for LMICs, and recycling of revenues.<sup>80</sup> Committing a portion of revenues to climate vulnerable countries or businesses that may be disadvantaged by a BCA is an important way of addressing these equity issues. Following the EU's BCA proposal – which, at present, allocates all revenues to the EU's budget<sup>81</sup> – the European Parliament called for a portion of these revenues to be invested in international climate finance.<sup>82</sup> Revenues could be used to support the decarbonisation of manufacturing processes in exporting countries, or improved monitoring of emissions. This would also tackle the equity issue of default values being used where producers cannot measure their emissions, which is likely to overstate actual emissions.<sup>83</sup> The EU's BCA could generate €2.1bn per year in revenues collected at the border in 2030, almost equal to the European

<sup>75</sup> Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests.](#)

<sup>76</sup> Mohan (2021) [BASIC nations oppose EU's plan to impose a 'carbon border tax'.](#)

<sup>77</sup> Lowe (2021) [The EU's Carbon Border Adjustment Mechanism: How to make it work for developing countries](#)

<sup>78</sup> Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests.](#)

<sup>79</sup> Gore et al. (2021) [What Can Least Developed Countries and Other Climate Vulnerable Countries Expect from The EU Carbon Border Adjustment Mechanism \(CBAM\)?](#)

<sup>80</sup> Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests.](#)

<sup>81</sup> European Commission (2021) [Carbon Border Adjustment Mechanism.](#)

<sup>82</sup> European Parliament (2021) [Towards a WTO-compatible EU carbon border adjustment mechanism.](#)

<sup>83</sup> Gore (2021) [The proposal for a Carbon Border Adjustment Mechanism fails the ambition and equity tests.](#); Gore et al. (2021) [What Can Least Developed Countries and Other Climate Vulnerable Countries Expect from The EU Carbon Border Adjustment Mechanism \(CBAM\)?](#).

Commission's contribution to international climate finance in 2019.<sup>84</sup> Unilateral commitments from members of a Carbon Club to allocate a portion of their BCA revenues to international climate finance could be a rapid and effective way of contributing to the urgent need to upscale funding for adaptation and mitigation in climate vulnerable countries.

Allied to trade and equity issues is the risk that the unilateral imposition of a BCA would endanger future multilateral negotiations.<sup>85</sup> The EU's BCA initiative suggests that even an organisation that is intrinsically collegiate sees this risk as necessary or manageable. As the UK Government concluded following COP26, "current policies would leave us on a path to a devastating temperature rise." NDCs and multilateral agreements have thus far failed to secure a path that keeps global heating below 1.5°C;<sup>86</sup> unilateral, simultaneous action through a Carbon Club offers a viable alternative. It may also be argued that a Carbon Club with sufficient membership, and an eye towards embedding international equity measures into BCAs could tip multilateral negotiations towards a more ambitious dialogue. An alternative route for avoiding concerns about sovereignty would be to roll BCAs out on a sector-by-sector basis, starting with the most heavy emitting sectors, thereby reducing resistance from whole nations and coalitions of nations.

BCAs need to be designed to allow developing countries to decarbonise and every effort should be made to help them to fund their transition. The agreement reached at COP26 to provide South Africa with such funding sets a good example, if only a starting place.<sup>87</sup> Developing countries with low heavy-emitting exports are amongst the most exposed to climate change and the poorest have little to fear from a BCA, but much to fear from global heating. The 14 largest emitters listed above are not the world's poorest countries and BCAs can be designed to address those countries and the products with the highest level of embedded emissions. Exclusions for least developed countries might be allowed under the WTO's Enabling Clause, as long as the criteria for exemption are based

<sup>84</sup> Gore (2021) [https://twitter.com/tim\\_e\\_gore/status/1412820949993508867?s=20](https://twitter.com/tim_e_gore/status/1412820949993508867?s=20); European Commission (n.d.) [International climate finance](#)

<sup>85</sup> Gore et al. (2021) [What Can Least Developed Countries and Other Climate Vulnerable Countries Expect from The EU Carbon Border Adjustment Mechanism \(CBAM\)?](#)

<sup>86</sup> In spite of the headline, the UK Government statement actually states that 1.8°C remains a possibility after COP26: UK Government (2021) [COP26 keeps 1.5C alive and finalises Paris Agreement](#)

<sup>87</sup> Mkhize (2021) [South Africa hails deal to end reliance on coal.](#)

on development indicators, and countries in similar conditions are treated the same way.<sup>88</sup> This raises one potential risk that if BCAs are implemented with uneven coverage, businesses may try to shift production to less-regulated countries, but a well-designed BCA will not permit this, as it would apply to all countries if progressively. In addition, it may well be more expensive to move production than to decarbonise it given that heaviest emitting industries in are land, capital, and knowledge intensive.

Another important design feature is to minimise the subjectivity in BCAs. In this way, an emissions-based mechanism is preferable to delivering unilateral judgements on the adequacy or comparability of climate action undertaken by other countries.<sup>89</sup> Such judgements not only allow for discrimination and political expediency (for example to accommodate strategically important trading partners) but also create uncertainty for business. That would defeat or weaken the purpose of the BCA.

A final relevant critique commonly raised against any form of carbon pricing is that it fails to deliver on desired decarbonization aims due to politically constrained low prices. Indeed, until recently, more than half of covered emissions have been under a carbon price of less than \$10 and the global average carbon price is \$2/tCO<sub>2</sub>.<sup>90</sup> Whereas the Carbon Pricing Leadership Coalition concluded that the explicit carbon-price level consistent with achieving the Paris temperature target is at least USD50–100/tCO<sub>2</sub> by 2030.<sup>91</sup> Recent carbon pricing efforts are beginning to catch up to these levels: The EU ETS allowances are trading at the equivalent of nearly \$50 and Canada has announced a carbon tax hike to reach CAD 170 (US \$135) by 2030.<sup>92</sup> As with domestic carbon pricing, for BCAs to succeed in accelerating global decarbonization they will need to be sufficiently high.

<sup>88</sup> Holzer (2014). *Carbon-related border adjustment and WTO law*. Low, Marceau, Reinaud (2011) Staff Working Paper ERSD-2011-1.

<sup>89</sup> OECD (2020). [Climate Policy Leadership in an Interconnected World: What Role for Border Carbon Adjustments?](#)

<sup>90</sup> Parry, I. (2019). *Putting a price on pollution*. Finance & Development, 56, 16–19.

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<sup>92</sup> Fischer, C., & Jacobsen, G. D. (2021). The Green New Deal and the future of carbon pricing. *Journal of Policy Analysis and Management*, 40(3), 988-995.





## 10. Conclusions

COP26 achieved some notable progress in a number of areas, but lacked mechanisms either to force compliance with what has been agreed, or to force the acceleration and greater ambitions that are required to limit global heating to 2.0°C, let alone the target of 1.5°C. BCAs are a powerful mechanism to accelerate the shift to a post carbon system, not in isolation from more direct measures such as targeted investment in clean energy technology and subsidy reform to transform the agricultural sector, but as a catalyst for them. BCAs offer a solution to help create the global economic *conditions* for tackling the super-wicked problem of climate mitigation. They respond to leakage issues and help to create an equitable playing field for economies already placing a price on carbon and they attract political support across partisan divides. If designed well, BCAs can also align with other strategic, social and economic policies that many countries are promoting, such as building back better after Covid-19 and levelling up to address inequality and pave the way for a just transition (both international and intranational). This overview has outlined how a Carbon Club of unilateral but parallel BCAs introduced by nations considering one, could cover close to half of global imports, presenting a serious lever for accelerating decarbonisation across the global market in this decisive decade.

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