

# »» The EU's carbon border adjustment: A trade barrier or an opportunity for global climate action?

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The European Union (EU) is stepping up its efforts on climate action. It wants to reduce greenhouse gas (GHG) emissions by 55% by the year 2030 relative to the 1990 baseline level, with the goal of being the first climate-neutral continent in 2050. An important element of this strategy is a higher price for GHG emissions in Europe. Particularly in emissions-intensive industries whose products are traded globally, however, that could lead to a loss of competitiveness and to a shift of emissions-intensive production processes (carbon leakage) outside the area of validity of the EU ETS.

In its perceived role of international climate action pioneer, the EU is planning to introduce a Carbon Border Adjustment Mechanism (CBAM). The EU Commission presented a draft regulation in July 2021. The EU initiative was launched in the fraught area between legal frameworks, external policy implications and administrative feasibility. The fact that there is no international experience of such a mechanism is proving to be a major challenge.

In theory, a full carbon border adjustment represents a highly effective instrument to protect against carbon leakage and safeguard competitive neutrality in domestic and international markets. Such an ideal adjustment mechanism is difficult to implement in practice, however, and that will likely limit the efficacy and incentive effect of the European CBAM. The greatest strength of the instrument is, in any case, its international orientation. Should the EU succeed in minimising political risks through smart negotiations and with diplomatic skill, the CBAM could be an opportunity for global climate action and pave the way for a global climate club. This will require a differentiated treatment of international partners. What will be decisive here are four different impact patterns which depend on the intensity of the trade relations in the included market segments and the climate policy ambitions of the respective country. Ideally, the CBAM would lead to an international convergence of carbon pricing – which would ultimately render the instrument itself superfluous again.

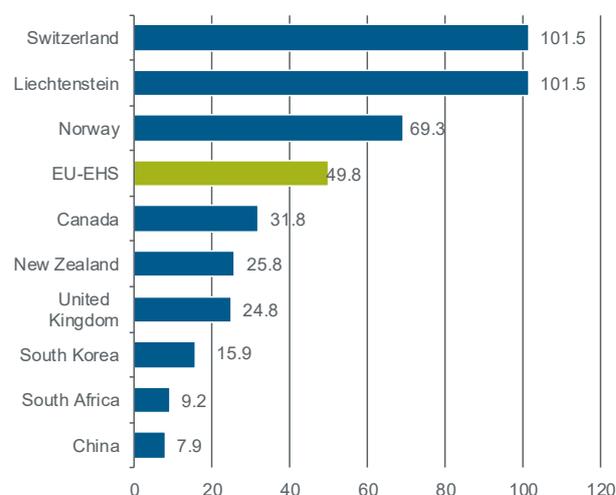
## Existing carbon leakage protection reduces climate action incentives, making it no longer sustainable

Under the Green Deal, the EU wants to cut its greenhouse gas emissions by 55% by 2030 relative to the 1990 baseline level and be the first climate-neutral continent in the year

2050. The EU Emissions Trading System (EU ETS) is to remain a key instrument of European climate policy in this context. In light of this goal, the price of emission allowances (the 'carbon price'<sup>1</sup>) is likely to rise significantly in the coming years.<sup>2</sup> The price of emissions certificates in the EU ETS already exceeds EUR 50 per ton of CO<sub>2</sub>. Only few countries among the EU's trading partners have comparatively high explicit carbon prices (Figure 1).

**Figure 1: National carbon prices outside the EU 27 in comparison with the EU ETS (top 10)**

In USD / tCO<sub>2</sub>



Note: Carbon prices as at 1 April 2021 and for China as at the first trading date under China's Emissions Trading Scheme (16 July 2021). Figures based on national carbon pricing initiatives (carbon tax or carbon emissions trading) outside the EU 27 that either have already been implemented in the corresponding country or for which there is a planned starting date. The comparability of the pricing systems is limited in part by differences in the number of sectors and greenhouse gases covered.

Source: World Bank

In the EU ETS, emissions are priced using a production side approach. Rising carbon prices also mean European industrial enterprises face rising costs relative to foreign enterprises that are not affected by the EU ETS. Particularly in emissions-intensive industries whose products are traded globally, such as steel or chemical feedstock, this could lead to a loss of competitiveness – and to a shift of production and emissions (carbon leakage) outside the area of validity of the EU ETS. Although this would lower emissions in the EU territory, nothing would be gained for the climate.

At this stage, empirical ex-post analyses do not yet provide any indications of relocations of emissions to regions with lower or non-existent carbon pricing as a direct consequence of the EU ETS.<sup>3</sup> The carbon leakage protection currently implemented under the EU ETS through the free allocation of certificates to emissions-intensive enterprises that compete internationally thus appears to have worked so far.

However, this mechanism also reduces the incentives for the affected enterprises to decarbonise and delays the necessary transition to climate neutrality into the future, where it will then have an even more disruptive effect because of the shorter time horizon. In addition, it may also put a disproportionate amount of pressure on other economic sectors, reducing the efficiency of the measures. The existing instrument of free allocation of certificates is thus no longer sustainable – also with a view to the scheduled decrease in the quantity of certificates.<sup>4</sup>

**Carbon border adjustment mechanism as the textbook example for carbon leakage protection**

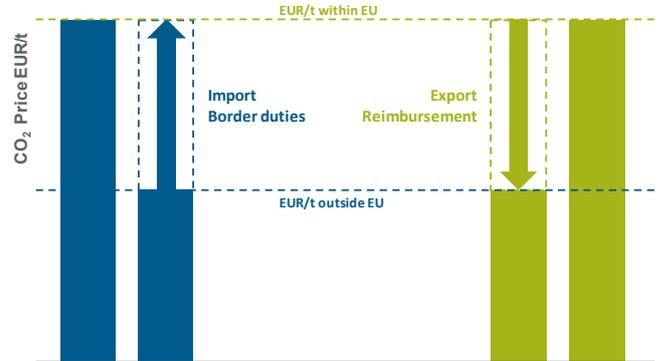
Under the Green Deal, the EU Commission plans to introduce a Carbon Border Adjustment Mechanism (CBAM) by the year 2023 that is to replace the free allocation of certificates in the future. The EU Commission expects this to create improved incentives to reduce emissions in the domestic market while providing protection from possible carbon leakage. In addition, proceeds generated from a CBAM are to flow into the EU budget as new own resources.<sup>5</sup> The EU’s initiative is drawing much international attention. A similar approach is being considered by some countries, including the US and Canada. On the international stage, however, there is a charge of protectionism.<sup>6</sup>

Under a comprehensive carbon border adjustment mechanism, imports would incur a levy at the border in accordance with their product-specific carbon footprint, while exports would attract a refund of carbon prices paid in the home country (Figure 2). In essence, the mechanism represents a transition from the production-side to consumption-side pricing of emissions. As it is less easy for consumers than producers to shift their location in order to avoid paying a price, a comprehensive border adjustment represents a highly effective instrument for carbon leakage protection, at least in theory. It also creates competitive neutrality both in domestic and foreign markets because it does not burden domestic producers with additional costs not levied from foreign competitors. A free allocation of certificates is no longer required. Accordingly, incentives for enterprises to decarbonise remain in place.

Nevertheless, such an ideal adjustment mechanism is difficult to implement in practice. Administrative feasibility remains a key challenge to implementation. After all, the carbon footprint of a product can be determined only with great effort (if at all). Furthermore, cost refunds on exports under a carbon adjustment mechanism would probably be incompatible with the current rules of the World Trade Organisation (WTO).<sup>7</sup> In the light of these difficulties, the implementation

options being debated at political level deviate considerably from an ideal mechanism (box).

**Figure 2: Illustration of a comprehensive carbon border adjustment mechanism**



Source: Droege, S. (2021): Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke, SWP-Studie 2021/S 09, 05.07.2021.

**Two pragmatic proposals for the implementation of an EU carbon price adjustment**

At political level, two main proposals on how a carbon price adjustment could be put in place have been debated: a border adjustment purely on imports and a European carbon consumption charge.

A **carbon border adjustment on imports** can be implemented either through a border tax on imports or by expanding the EU ETS to imports. A border tax would mean imposing a tax on imports. The level of this tax would match the European carbon price on corresponding products. This would establish a balance that accounts for the burden from the price on carbon emissions charged to domestic enterprises under the EU ETS. Alternatively, a border adjustment on imports can be implemented by expanding the EU ETS to imports.<sup>8</sup> Imports would then be included in the existing ETS certificate pool, or certificates would have to be purchased from a separate pool at a price that matches the certificate price under the ETS.

An alternative would be to implement a carbon price adjustment by way of a European **consumption charge**.<sup>9</sup> A lump sum consumption charge would be applied to goods sold in the EU irrespective of their origin. Depending on how this charge is configured, it could be based either on the specific carbon content of the goods or on their weight. The consumption charge would constitute a burden additional to the EU ETS for domestic products and imports but not for exports. In combination with corresponding relief, such as maintenance of the free allocation of emissions certificates, however, the consumption charge could in principle be realised so that it does not create any additional burdens for domestic enterprises.

Both proposals differ greatly with respect to their legal conditions, external policy impact, leverage for climate

action and administrative feasibility.<sup>10</sup> For example, a border adjustment on imports as an expansion of the EU ETS would presumably be easier to introduce under EU law than a consumption charge. At the same time, a border adjustment is the riskier strategy from the viewpoint of WTO rules and external policy because the trading partners could perceive it as a protectionist measure. However, it does allow the possibility of maintaining the existing EU ETS as a guiding instrument, while the consumption charge is compatible with the existing domestic and international climate policy only to a limited extent. The border adjustment permits climate action policies of other countries to be offset. It is therefore particularly suitable for a strategy with an international focus. At the same time, it also poses the risk of alienating potential partner countries. A consumption charge is more suitable in the context of a strategy that does not aspire to encourage other countries to cooperate.<sup>11</sup> It concentrates on providing a level playing field for domestic businesses.

### Key elements of the draft regulation for a European CBAM

On 14 July 2021 the EU Commission presented a proposal for a European CBAM in the context of the publication of its 'Fit for 55' climate package.<sup>12</sup> For the time being, the draft regulation is just a proposal. The European Parliament and the Council of Ministers still need to consult and agree on it. Experience shows that the package is likely to be revised in many points and might even be fundamentally modified.

The Commission's plans provide for the CBAM to be applied to all third countries trading with the EU 27 except Iceland, Norway, Switzerland and Lichtenstein.<sup>13</sup> The draft does not provide for a specific exemption for developing countries, as is otherwise customary in trade policy. Instead, it provides for the mechanism to be phased in over a three-year period from 2023. The CBAM is to cover only imported goods of specific sectors that belong to those that are at greater risk of carbon leakage in the EU. In other words, the Commission does not plan to refund the carbon costs of export goods. At first, the CBAM is to apply specifically to aluminium, iron, steel, cement, fertiliser and electricity. However, the Commission would have the power to expand or shorten the list of sectors covered.

Under the EU's proposal, importers have to acquire a quantity of CBAM certificates that corresponds to the carbon footprint of the imported goods. Their price is based on the average of the closing prices of all ETS auctions in the EU in the preceding week. At least during the introductory phase, average sector-based reference values for specific carbon emissions (referred to as carbon benchmarks) for the relevant product category are to determine how many certificates must be acquired. Alternatively, enterprises may also document their actual emissions. For the time being, free certificates are to continue to be issued under the EU ETS during a period yet to be determined. The certificates to be acquired under the CBAM are to increase at the rate the free alloca-

tions under the ETS are reduced. If importers can demonstrate on the basis of verified information from third country producers that a carbon price was already paid in the production of an imported good, they may be granted corresponding discounts on the basis of national agreements.

### Accuracy of the CBAM depends on the precise measurement of product emissions

With a view to the efficacy of carbon leakage protection and safeguarding competitive neutrality, whether or not it is possible to determine the carbon content of goods objectively and unequivocally will be crucial.<sup>14</sup> Practical implementation of the CBAM therefore requires significant bureaucratic effort overall. Against this backdrop, and with a view to administrative manageability, the EU's proposal to limit the scheme to individual emissions- and trade-intensive sectors is appropriate.

Measuring the carbon footprint of individual goods is turning out to be very challenging, as all carbon emissions released in the value chain of the good must be counted. It requires numerous exceptions and the use of flat-rate simplifications, like the carbon benchmarks from the EU ETS as proposed in the EU's draft legislation. These benchmarks are, however, not entirely free of problems.<sup>15</sup> They take into account only a portion of the goods used all along the value chain of production and that would probably influence the efficacy of the CBAM in a decisive manner.<sup>16</sup> The right of foreign suppliers to claim a lower basis for calculation after demonstrating the carbon content of their products would provide foreign producers with greater incentives to innovate. The danger here, however, is that the validation of lower emissions abroad is difficult to verify.<sup>17</sup>

### Absence of arrangement for exports is Achilles' heel of CBAM

Before the draft regulation was published, there was intense debate on how the CBAM should treat exports. The fact is that the proposed European CBAM is not really intended to be a comprehensive border adjustment scheme that charges a levy on imports at the border based on their carbon footprint and refunds carbon prices paid on exports but a purely import-based approach. This decision was presumably made for pragmatic reasons. Different assessments accordingly, under WTO rules, refunding carbon prices on exports could be identifiable as a contestable or prohibited subsidy.<sup>18</sup> Furthermore, expanding the mechanism to exports could provoke greater trade conflicts with partner countries.

Nonetheless, failure to include exports considerably weakens the efficacy of the CBAM. If exports are not refunded, incentives to reduce carbon emissions from production in the EU remain fully in place. In foreign markets, however, European producers face competitive disadvantages. Particularly for Germany, which is heavily export-oriented, this could create disadvantages in international trade. If the free allocations of certificates end in the future and exports are not included in the border adjustment scheme, the CBAM will exacerbate

competitive disadvantages for European producers compared with the status quo. As the CBAM would then make EU goods relatively less attractive for exports while at the same time making the EU less attractive as a destination for imports, implementing the CBAM could risk isolating the EU in global trade. There is likely heavy internal pressure on the EU to include exports in the CBAM, either by continuing free allocation or by refunding carbon costs incurred.<sup>19</sup> However, both are likely to be problematic with a view to WTO conformity.<sup>20</sup>

### **Direction of CBAM's global climate leverage is uncertain**

There is hope that a border adjustment can unfold climate leverage vis-à-vis countries that so far have unambitious climate targets. After all, the CBAM is designed to address and put a price on global emissions for the first time, at least to the extent this has not yet been done in producer countries. It underscores the EU's self-image as an international pioneer in climate action. In a global economy that is increasingly committing to the long-term goal of climate neutrality, that can mean a head start in the race for sustainable technologies while creating inspiration for latecomers to international climate action.

The Advisory Council to the Federal Ministry for Economic Affairs and Energy believes that other countries may respond to a border adjustment mechanism by introducing or expanding own carbon pricing schemes because it will then no longer be possible for them to use the absence of ambitious carbon pricing in the European market as a locational advantage.<sup>21</sup> This would be conceivable at least to the extent that enterprises from countries that already have an own carbon pricing system will be granted discounts based on national agreements – as is intended under the current proposal. The CBAM would therefore be an instrument that enables cooperation to be rewarded and non-cooperation to be sanctioned. That would improve the efficiency of global climate action policy.

Obviously, the EU's greater efforts do not mean that other countries will automatically follow. Rather, it is also conceivable that the CBAM may reduce the incentives of other countries to implement climate action policies themselves if the increased efforts of the EU make their own action appear less urgent. In its proposed configuration, the European CBAM could constitute a disincentive for third countries to implement ambitious climate actions of their own. This could be the case particularly in countries whose enterprises compete with European enterprises in global markets. Rising European carbon prices give foreign enterprises a relative price advantage over European competitors in sales markets outside the EU – both in their own production processes and in the importation of inputs. This could discourage such countries from introducing a high carbon price of their own.<sup>22</sup>

### **Proceeds from the European CBAM should be used in a targeted manner**

The CBAM is also intended to generate a new source of own resources for the EU. The proposed benchmarking with the

possibility of demonstrating and claiming lower foreign carbon content means that the proceeds might remain significantly lower than what would be generated under a full border adjustment mechanism. The proceeds that would be achievable under the planned configuration of the CBAM are therefore likely to be moderate overall.<sup>23</sup>

How the proceeds are applied will probably play an important role for the WTO conforming configuration of the CBAM.<sup>24</sup> Among other things, the aim is for the scheme to cover the costs incurred by the EU from temporarily borrowing new funds in connection with the COVID-19 pandemic and generally to finance measures that serve the objectives of the EU.<sup>25</sup> From an incentive point of view it would be more useful to employ the proceeds from the CBAM in a more targeted manner. Feeding the proceeds from the certificates back to the countries of origin or using the funds for other international climate projects can be expected to generate greater acceptance of the idea of the CBAM among the EU's trading partners.<sup>26</sup> The German Council of Economic Experts proposes to use the proceeds generated from the carbon border adjustment as transfer payments for developing and emerging countries to make the transition towards climate neutrality easier for them.<sup>27</sup> Various studies demonstrate that developing and emerging economies are disproportionately burdened by border adjustment instruments if industrialised countries retain proceeds thus generated.<sup>28</sup> Such considerations appear particularly sound against that background.

### **WTO conformity remains an element of uncertainty**

As a carbon border adjustment intervenes in international trade, the WTO rules play an important role for its configuration. The European CBAM must therefore be consistent with applicable WTO rules. In principle, a carbon border adjustment system is compatible with both EU law and WTO rules – even in different configurations.<sup>29</sup> However, the devil is in the detail. Particularly with regard to WTO rules, it is very important for the instrument to be designed with as little discrimination as possible and justifiable on the basis of environmental and climate action considerations.<sup>30</sup> Ultimately, it would probably take a dispute to clarify whether the specific implementation of the CBAM contained in the draft regulation would be WTO conforming. But it can be assumed that pitfalls still lurk in individual elements of the draft regulation that could require amendments, for example with a view to the planned (temporary) continuation of free allocations under the EU ETS and lack of exemptions for developing countries.<sup>31</sup>

### **Likelihood of retorsion depends on sector impact and integration of trading partners**

Even if the European CBAM can be successfully designed to be WTO conforming, trading partners might regard a unilaterally introduced border adjustment by the EU as a protectionist measure and prompt them to adopt trade-related retorsion measures. Both the Trump administration and China have declared in the past that they would respond with counter-measures to a carbon border adjustment scheme imposed by the EU.<sup>32</sup> For Germany as an export-oriented country, a

trade conflict particularly with the US as a major export country can result in a significant loss of value added which could then far outweigh the positive effects of a border adjustment. It is therefore crucial for this adjustment mechanism to be designed so that it is accepted by as many countries as possible.<sup>33</sup> The intended exemptions for countries with equivalent carbon pricing systems are therefore a key element of the draft regulation.

Overall, the likelihood of retorsion will likely depend crucially on how severely a trading partner is directly affected by the planned European mechanism. Most of the iron and steel trade among the EU 27 member states currently takes place within the internal market. Some 30% of import value is sourced from outside the EU 27 (Figure 3). A glance at the most important trading partners of the EU 27 shows that by far the greatest import value of iron and steel comes from Russia. Other major import countries that do not charge an own carbon price – and are therefore directly affected by the CBAM – are Turkey and India. Ukraine has an own carbon tax, but its price is far below the price level of the EU ETS. In other words, the introduction of the CBAM may potentially put an additional strain on the economic relations with these countries in particular. The United Kingdom has a carbon price comparable to the EU 27 and is likely to benefit from having its national climate efforts recognised. China introduced a carbon trading system of its own early this year that is initially limited to some enterprises in the energy sector. However, the carbon price under the Chinese system is relatively low thus far (Figure 1). The US ranks only 14th on the list of major countries from which the EU 27 imports iron and steel. The direct effect of the CBAM on that country would therefore be relatively minor – despite not having a carbon price of its own.

Major export destinations for iron and steel that do not have a comparable carbon price are, above all, Turkey and the United States. Without an export rebate, competitive disadvantages can be expected for European enterprises particularly in these markets. Besides encouraging possible cost disadvantages without an export rebate, European exporters could also be hit by retaliatory trade policy responses such as tariffs. Major suppliers to the EU in particular could take advantage of this weakness as a basis for mounting an opposition against the CBAM. If the US, for example, were to respond to the CBAM by imposing punitive tariffs on EU exports, it would hit the EU where it hurts. This weakens the EU's negotiating position towards the US.

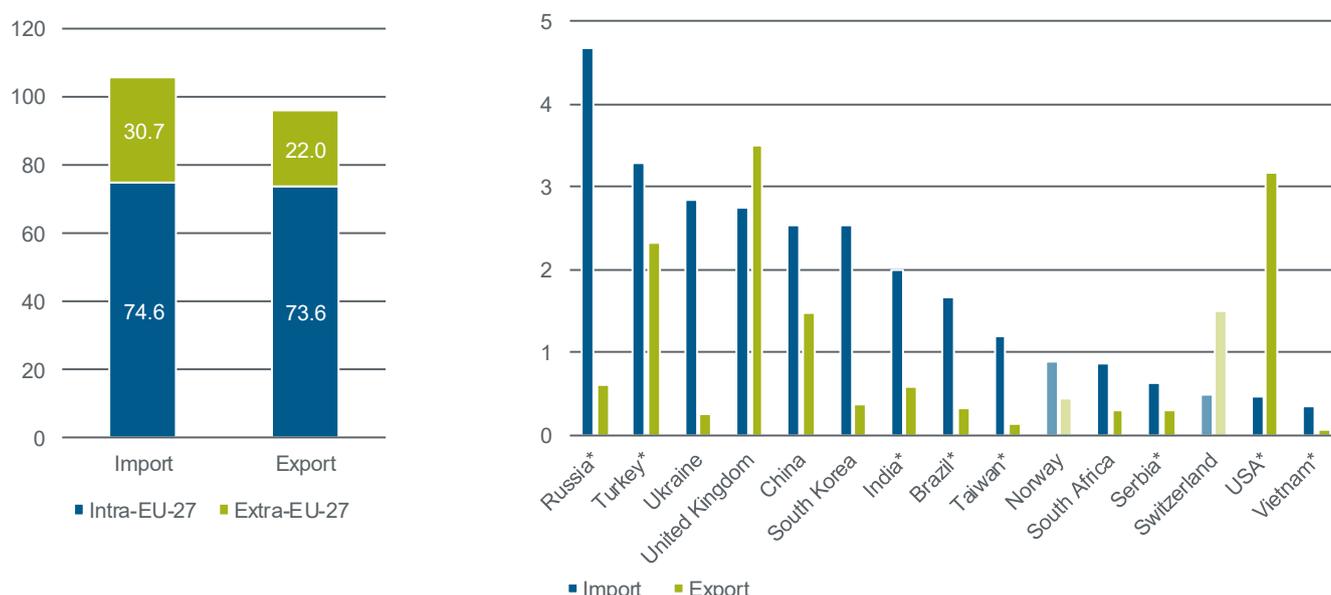
The draft regulation also provides for the CBAM to cover aluminium, cement, fertiliser and electricity. The picture for these goods is similar with a view to the trading partners, although they are generally traded much less across EU borders.

**The CBAM is only one building block in the policy toolbox for a climate-neutral economy**

A unilateral climate policy is severely limited in its ability to solve an inherently global problem. Even if the EU cuts its greenhouse gas emissions to zero, it can make only a very small direct contribution to limiting global warming because it is responsible for only around 10% of global greenhouse gas emissions.<sup>34</sup> The debate about the CBAM centres on direct leakage, which describes the relocation of the manufacture of carbon-intensive goods to other countries in response to a change in relative prices. But in addition to direct leakage, there is also indirect leakage. It occurs when a region unilaterally reduces its consumption of emissions-intensive resources, thereby inducing changes in global prices of

**Figure 3: Iron and steel trade between the EU 27 and the largest economies**

Average trade value in the years 2018 and 2019 in billions of euros



Note: An asterisk denotes countries that have no national carbon price. Norway and Switzerland are linked to the EU ETS, which is why the planned CBAM will not be applied to them.

Source: Eurostat, 2021

resources which, for its part, increases the consumption of those resources in other regions. As a general principle, a carbon price adjustment can address only the problem of direct leakage but not that of indirect leakage.<sup>35</sup>

The fact that the CBAM will not solve the challenges of the climate crisis on its own is no reason to reject the instrument. Nevertheless, its potential should be assessed realistically. A comprehensive approach is necessary to achieve what the CBAM cannot achieve on its own. The global transformation towards a climate-neutral economy holds great opportunities for industrial policy which Europe should not squander. As time is running out, and given the risk of path dependencies, it appears doubtful whether rising carbon prices alone can trigger in-depth innovation effects quickly enough. In order to help disruptive technologies make a fast breakthrough, specific incentives for climate investment, for example in the form of carbon contracts for difference (CCfD) are likely to be necessary in the short term. At global level and in order to sufficiently address indirect leakage as well, a global carbon price would be the first-best solution, even if it will likely not be realisable for the foreseeable future. However, every climate policy tool should be assessed at least on the basis of whether or not it creates an obstacle to adopting a path in this direction at a later stage.

In what ways the EU manages the option of recognising climate action policies of other countries in implementing the CBAM will likely be crucial for its international acceptance. Particularly with a view to the US, which is not expected to introduce an explicit carbon price at national level any time soon, cooperation in the form of implicit carbon prices, for example the recognition of regulatory climate policy measures, should also be taken into consideration. Any decision by the EU to recognise only price-based instruments as

equivalent would gamble away the opportunity to strengthen the common goal of climate neutrality at international level – irrespective of the tools used.<sup>36</sup>

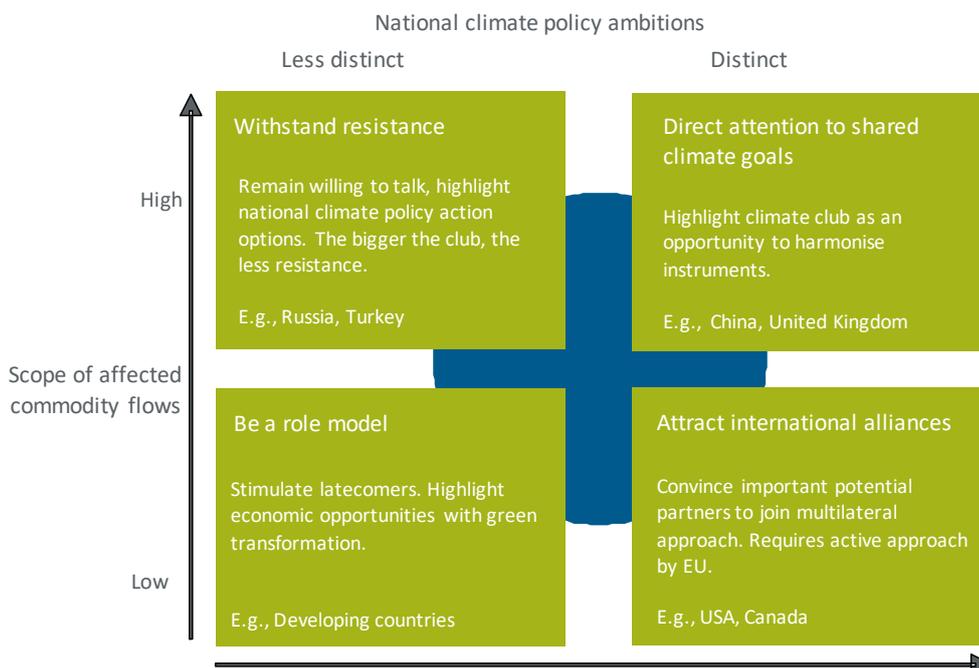
**The CBAM as a first step towards a globally coordinated climate policy: The prospect of a climate club**

By deciding in favour of the CBAM and against a European consumption charge, the EU already made a decision on its future direction. Its focus is on an outward strategy and on international climate action. This starting point must now be used as effectively as possible. One of the most important factors for the success of climate action is international climate diplomacy. The European CBAM may have the potential to give global climate policy new impetus. The planning of the CBAM alone already triggered important debates in many countries.<sup>37</sup> Whether the instrument will ultimately be used at all remains to be seen in the course of the negotiations.<sup>38</sup> The more countries cooperate with the EU on climate policy, the lesser the need to use the instrument in the first place.

Our analysis shows that the impact on the trading partners from the EU's initiative will be decided along the lines of two dimensions: First, the intensity of the trade relations in the market segments that are affected by the planned CBAM. Second, the degree of their own climate policy ambitions, as this can be recognised in the framework of the CBAM, thereby reducing the resulting price surcharge. In order for the CBAM to be able to increase the probability of international cooperation, the EU must choose a differentiated approach to the various affected groups (Figure 4).

The more a country's exports are affected by the European CBAM and the lower its own current ambitions for action on GHG reduction, the more confrontational a response to the (planned) introduction should be expected. If a country is

**Figure 4: The CBAM as a trailblazer for a climate club**



Source: own rendition

generally affected but already pursuing national climate action approaches, that will provide an important starting point for bilateral negotiations. The costs of harmonising the carbon regime, for example in the framework of a climate club, can be lower in this case than under the resulting carbon adjustment by the EU. Entry points also exist for countries whose exports would initially be unaffected by the European CBAM. Here, the mechanism does not have any immediate (negative) consequences but underscores the determination of the EU, so that it could become easier to attract international alliances (Figure 4).

Given the most recent commitments of the US and China to step up their climate action, the timing might be opportune for a global, transnational climate action measure. The EU should seize the momentum of the upcoming COP26 in order to step up its efforts for a multilateral approach (EU with US and other major trading partners) and seek international alliances. Taking into account the countries on which the CBAM will foreseeably have a significant impact, but also its own vulnerability as an exporter, the EU should reinforce diplomatic ambitions with the relevant countries in order to move away from more intense trade conflicts and arrive at an agreement in the interest of global climate action. The chosen design of the CBAM will have only a relatively minor impact on the US in particular as a trading partner of the EU. That means the door to climate negotiations with the US should remain open despite the EU's initiative. The same applies to China, where the newly introduced emissions trading scheme opens up opportunities for agreements. If the EU succeeds in explaining its approach to potential cooperation countries in detail, and if it remains willing to negotiate details of implementation and exemptions, the CBAM can become an opportunity for global climate action.

Under the condition that the most important trading partners agree on a common approach and mutually recognise climate action measures adopted in the country of origin, coordinated border adjustment systems might enable the idea of a climate club<sup>39</sup> to be realised, allowing progress to be made

towards global carbon pricing. The Scientific Advisory Council to the Federal Ministry of Economics also recommends this in its current report.<sup>40</sup> Within the climate club, the EU could then dispense with the CBAM. That would represent a strong incentive for other countries to join this climate club and undertake greater efforts for climate action themselves.<sup>41</sup> The larger such a climate club, the greater the positive effects of the CBAM – and the lesser the previously described risk of isolation in global trade. What would be critical is for the club to be strong enough to resolutely counter the resistance of countries whose exports would be relatively heavily impacted by the introduction of the CBAM and which, at the same time, exhibit little national climate policy ambition. Therefore, the most important countries that would first have to be won over to join such a club are the US and China. Germany's G7 presidency from next year might be a suitable framework in which to forge such an international alliance.<sup>42</sup>

US Democratic representatives recently presented a proposal for a US CBAM.<sup>43</sup> This draft already differs from the European proposal for the simple reason that the US does not have a national carbon market. It is also still unclear whether the proposal will pass the Senate and would be compatible with WTO rules. If it were to be implemented, however, the US carbon border adjustment scheme might form an important linkage to the European CBAM. In any case, the foundation for a coalition to strengthen joint climate ambitions appears to have been laid.

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<sup>1</sup> The entire document refers to 'carbon price' and 'carbon border adjustment' for the purpose of simplification, even though this also includes other greenhouse gases converted to CO<sub>2</sub> equivalents (CO<sub>2e</sub>). This simpler language is customary in the literature and reflects the fact that CO<sub>2</sub> represents by far the largest portion of greenhouse gas emissions.

<sup>2</sup> Edenhofer et al. (2019): Optionen für eine CO<sub>2</sub>-Preisreform (*Options for a CO<sub>2</sub> price reform* – our title translation, in German only), German Council of Economic Experts, Working paper 04/2019.

<sup>3</sup> Dechezleprêtre et al. (2021): Searching for carbon leaks in multinational companies, Grantham Research Institute on Climate Change and the Environment Working Paper No. 165. Naegele, H., and Zaklan, A. (2019): Does the EU ETS cause carbon leakage in European manufacturing? *Journal of Environmental Economics and Management*, 125: 147.

<sup>4</sup> The results of various ex-ante simulation studies also bear this out. Cf. i. a. Branger, F. and Quirion, P. (2014): Would border carbon adjustments prevent carbon leakage and heavy industry competitiveness losses? Insights from a meta-analysis of recent economic studies, *Ecological Economics*, 99: 29–39. For sectors with a high leakage risk, the current legislation provides for a continuation of the free allocation along the benchmark values with a cross-sectoral correction factor up to 2030. It is to be reduced to 30% by 2026 and expire entirely in 2030.

- <sup>5</sup> Interinstitutional Agreement between the European Parliament, the Council of the European Union and the European Commission on budgetary discipline, on cooperation in budgetary matters and on sound financial management, as well as on new own resources, including a roadmap towards the introduction of new own resources, Interinstitutional Agreement of 16 December 2020 between the European Parliament, the Council of the European Union and the European Commission on budgetary discipline, on cooperation in budgetary matters and on sound financial management, as well as on new own resources, including a roadmap towards the introduction of new own resources, OJ L 4331, 22.12.2020: 28–46.
- <sup>6</sup> For an overview of the international reactions to the move by the EU Commission, see: Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021. The US, China, Russia, South Africa and India were critical of the initiative before it was adopted. Cf. i. a. FT (2021): John Kerry warns EU against carbon border tax, <https://www.ft.com/content/3d00d3c8-202d-4765-b0ae-e2b212bbca98>; The Wall Street Journal (2021): Europe's Carbon Border Tax Plan Looms Over Global Trade, <https://www.wsj.com/articles/europes-carbon-border-tax-plan-looms-over-global-trade-11623321116>; South African Government (2021): Joint Statement issued at the conclusion of the 30th BASIC Ministerial Meeting on Climate Change hosted by India on 8th April 2021, <https://www.gov.za/speeches/joint-statement-issued-conclusion-30th-basic-ministerial-meeting-climate-change-hosted>; Politico (2021): China's Xi slams EU carbon border levy plans, <https://www.politico.eu/article/chinas-xi-seeks-macron-merkel-climate-change-co2-cop26-emissions/>; Euractiv (2020): Russia warned: CO<sub>2</sub>-Grenzsteuer der EU nicht mit WTO-Regeln vereinbar (EU Carbon border tax incompatible with WTO rules – our title translation, in German only), <https://www.euractiv.de/section/energie-und-umwelt/news/russland-warnt-co2-grenzsteuer-der-eu-nicht-mit-wto-regeln-vereinbar/>.
- <sup>7</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021 Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.
- <sup>8</sup> Lamy, P. Pons, G. and Leturq, P. (2020): Greening EU trade: A European Border Carbon Adjustment Proposal, Europe Jacques Delors Policy Paper, June 2020.
- <sup>9</sup> Ismer, R., Neuhoﬀ, K. and Pirlot, A. (2020): Border Carbon Adjustments and Alternative Measures for the EU ETS: An Evaluation, DIW Discussion Paper 1855. Böhringer, C., Rosendahl, K. E. and Storrøsten, H. B. (2017): Robust Policies to Mitigate Carbon Leakage, Journal of Public Economics, 149 (2): 35–46.
- <sup>10</sup> For an in-depth discussion of different border adjustment systems under a range of goals and ancillary conditions, cf. Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021, and Ismer et al. (2021): Climate Neutral Production, Free Allocation of Allowances under Emissions Trading Systems, and the WTO: How to Secure Compatibility with the ASCM. DIW Discussion Paper No. 1948.
- <sup>11</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.
- <sup>12</sup> European Commission (2021): Proposal for a regulation of the European Parliament and of the council establishing a carbon border adjustment mechanism, 2021/0214 (COD).
- <sup>13</sup> The EU ETS covers all EU countries and additionally Iceland, Lichtenstein and Norway. The emissions trading system of Switzerland has also been linked to the EU ETS since 2020. It is for these reasons that the planned CBAM would not apply to those countries.
- <sup>14</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.
- <sup>15</sup> Key Questions for the EU. ifo DICE Report I / 2020 Spring Volume 18.
- <sup>16</sup> Garnadt, N., Grimm, V. and Reuter, W. (2020), Carbon Adjustment Mechanisms: Empirics, Design and Caveats, SVR working paper 11/2020. Kolev et al. (2021), Carbon Border Adjustment Mechanism: Motivation, Ausgestaltung und wirtschaftliche Implikationen eines CO<sub>2</sub>-Grenzausgleichs in der EU (Motivation, configuration and economic implications of a carbon border adjustment in the EU – our title translation, in German only), IW Policy Paper 6/21.
- <sup>17</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.
- <sup>18</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.
- <sup>19</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.
- <sup>20</sup> Ismer et al. (2021): Climate Neutral Production, Free Allocation of Allowances under Emissions Trading Systems, and the WTO: How to Secure Compatibility with the ASCM. DIW Discussion Paper No. 1948.
- <sup>21</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.
- <sup>22</sup> Ismer et al. (2021): Border Carbon Adjustments and Alternative Measures for the EU ETS - An Evaluation. DIW Discussion Paper No. 1855.
- <sup>23</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.
- <sup>24</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.
- <sup>25</sup> Interinstitutional Agreement between the European Parliament, the Council of the European Union and the European Commission on budgetary discipline, on cooperation in budgetary matters and on sound financial management, as well as on new own resources, including a roadmap towards the introduction of new own resources, Interinstitutional Agreement of 16 December 2020 between the European Parliament, the Council of the European Union and the European Commission on budgetary discipline, on cooperation in budgetary matters and on sound financial management, as well as on new own resources, including a roadmap towards the introduction of new own resources, OJ L 4331, 22.12.2020: 28–46
- <sup>26</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.
- <sup>27</sup> German Council of Economic Experts (2020), Corona-Krise gemeinsam bewältigen, Resilienz und Wachstum stärken (Overcoming the coronavirus crisis together, strengthening resilience and growth – our title translation, in German only), annual report 2020/21.
- <sup>28</sup> MCC (2020): Safeguarding Europe's climate protection: How to address free riding and prevent emissions from merely shifting to other regions of the world, MCC Policy Brief No. 7.
- <sup>29</sup> Stiftung Umweltenergierecht (Foundation for Environmental Energy Law) (2021), Eine EU CO<sub>2</sub>-Bepreisung für internationale Importe. Europa- und völkerrechtliche Einordnung eines CO<sub>2</sub>-Grenzausgleichssystems (Carbon Border Adjustment Mechanism CBAM) vor dem Hintergrund der weltweiten Klimaschutzbemühungen (EU Carbon pricing for international imports. Carbon border adjustment mechanism (CBAM) in a European and International law context against the backdrop of global climate action efforts – our title translation, in German only), No. 52, June 2021.
- <sup>30</sup> Droege et al. (2018), Mobilising Trade Policy for Climate Action under the Paris Agreement. Options for the European Union. German Institute for International and Security Affairs. SWP Research Paper of February 2018
- <sup>31</sup> Stiftung Umweltenergierecht (Foundation for Environmental Energy Law) (2021), Eine EU CO<sub>2</sub>-Bepreisung für internationale Importe. Europa- und völkerrechtliche Einordnung eines CO<sub>2</sub>-Grenzausgleichssystems (Carbon Border Adjustment Mechanism CBAM) vor dem Hintergrund der weltweiten Klimaschutzbemühungen (EU Carbon pricing for international imports. Carbon border adjustment mechanism (CBAM) in a European and International law context against the backdrop of global climate action efforts – our title translation, in German only), No. 52,

June 2021.

<sup>32</sup> Cf. e.g. Financial Times (2020): US Threatens Retaliation Against EU over Carbon Tax, <https://www.ft.com/content/f7ee830c-3ee6-11ea-a01a-bae547046735>. The political environment has probably improved noticeably in the meantime, however.

<sup>33</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.

<sup>34</sup> Based on the emission data of the Global Carbon Project (2020): <http://www.globalcarbonatlas.org/en/content/welcome-carbon-atlas>

<sup>35</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.

<sup>36</sup> Potsdam Institute for Climate Impact Research (2021): Industrierende: Wettbewerbseffekte und Carbon Leakage. Neue Politikmaßnahmen im Zuge des Europäischen Green Deal (*Industrial turnaround: Effects on competition and carbon leakage. New policy measures in the context of the European Green Deal* – our title translation, in German only), July 2021.

<sup>37</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.

<sup>38</sup> Droege, S. (2021), Ein CO<sub>2</sub>-Grenzausgleich für den Green Deal der EU: Funktionen, Fakten und Fallstricke (A carbon border adjustment mechanism for the EU's Green Deal: Functions, facts and pitfalls – our title translation, in German only), SWP study 2021/p 09, 5 July 2021.

<sup>39</sup> Nordhaus, W. (2015), 'Climate Clubs: Overcoming Free-riding in International Climate Policy', American Economic Review 105 (4): 1339–1370. Cramton, P., MacKay, D. J. C., Ockenfels, A. and Stoff, S. (eds.) (2017), 'Global Carbon Pricing: The Path to Climate Cooperation', MIT Press.

<sup>40</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.

<sup>41</sup> Scientific Advisory Board to the German Federal Ministry of Economic Affairs (2021), A CO<sub>2</sub>-Border Adjustment Mechanism as a Building Block of a Climate Club, report dated 22 February 2021.

<sup>42</sup> The German Federal Government has already mentioned such plans, cf. EID (2021), Bundesregierung will Staaten für "internationalen Klimaclub" gewinnen (*Federal Government wants to win over countries for an 'international climate club'* – our title translation, in German only).

<sup>43</sup> A Carbon Border Adjustment was already among the climate action announcements made in the US election campaign. Some Republicans even supported such an initiative. Cf. i. a. E&E News (2020): Senate Republicans in Talks about Border Carbon Fee, <https://www.eenews.net/stories/1063733955> (accessed on 23 July 2021). Just one week after the EU Commission published the draft legislation for the European CBAM, US Democratic representatives presented a bill for a US carbon border tax. Cf. also: <https://www.coons.senate.gov/imo/media/doc/GAI21718.pdf>