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Galina Kolev

Carbon Border Adjustment and Other Trade Policy Approaches for Climate Protection

The 14th of July will go down in history not only as the day of the storming of the Bastille, i.e. the flashpoint of the 18th century French Revolution, but also as the day, in 2021, when the European Commission published its proposal for the Fit for 55 package with trade policy measures to support climate protection (see European Com-

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mission, 2021a). On this same day, Democrats in the US Congress introduced the idea of a polluter import fee.

Motivation for carbon border adjustment

The idea of a carbon border adjustment mechanism (CBAM) is crucial to level the playing field between domes-

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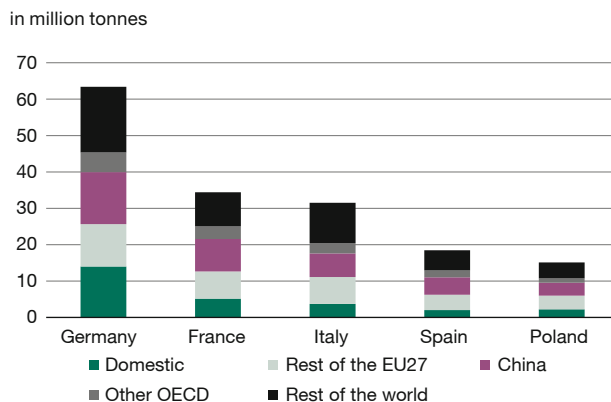
tic producers and foreign suppliers of carbon-intensive products. In 2021, only about one-fifth of global CO₂ emissions are subject to a carbon pricing mechanism and the global average price lies at just US \$3 per tonne CO₂ (Parry et al. 2021; World Bank, 2021). In the European Union, the price for CO₂ certificates traded within the European Emissions Trading System (EU ETS) averaged about €55/tonne (about US \$65/tonne) CO₂ from May to October 2021 and is likely to further increase as the number of certificates is set to decrease faster in the coming years as part of the Fit for 55 package. This creates incentives to outsource production of carbon-intensive products to countries with lower climate protection ambitions in accordance with the pollution haven hypothesis (see e.g. Levinson and Taylor, 2008), a phenomenon broadly known as carbon leakage. The overall effect will most likely be higher global CO₂ emissions since countries with lower climate protection standards are mostly developing and emerging economies with less CO₂ efficient technologies of production.

Currently, the EU ETS targets the problem of carbon leakage by allocating free carbon emission allowances to producers of goods with high CO₂ intensity like steel or cement. Although this system is effective in preventing carbon leakage, it is not efficient as it creates incentives to improve production technologies or to invest in green production only indirectly and to a limited extent. OECD (2021) data shows that in 2018 the net CO₂ imports of the EU27, i.e. the amount by which CO₂ emissions embedded in imported goods exceed CO₂ emissions needed to produce exported goods, were as high as 400 million tonnes CO₂ – although the EU is a net exporter of goods. These data cannot be interpreted directly as carbon leakage since the net CO₂ imports of the EU may result from specialisation patterns in the past that are not related to climate protection policies. However, the incentive for moving production to pollution havens will further increase because of the rising gap between the current CO₂ prices in the EU and other countries worldwide. With the target of reducing carbon emissions of the participating sectors by 43% compared to the level in 2005, the European Commission (2021b) decided to decrease the number of certificates by 2.2% starting in 2021 instead of 1.74% as in the previous years. Furthermore, looking ahead, there will be even stricter climate policy, and the Commission plans to phase out the free allocation of certificates over ten years starting in 2026. CBAM should be introduced as a measure to tackle the problem of carbon leakage instead.

What is CBAM?

The CBAM proposal by the European Commission (2021a) is targeted at reducing the incentives for carbon leakage by levelling the playing field in the internal market by mak-

Figure 1
CO₂ emissions embodied in domestic final demand for basic metals, 2018



Source: OECD (2021).

ing foreign suppliers of carbon-intensive products pay the same price for the CO₂ emissions embodied in their products as European producers. From 2026 on, CBAM will be phased in gradually while phasing out the free allocation of CO₂ certificates. For the purpose of non-discrimination, EU importers will have to buy carbon certificates corresponding to the carbon price paid for goods produced within the EU and only to the extent to which the European producers have to pay for CO₂ emissions. If non-EU producers are able to show that they have already paid a carbon price in a third country, then this carbon price may be deducted. The implementation will start in 2023 with a reporting system. A transition period until 2026 should secure legal certainty and stability while the European Commission stays in dialogue with important trading partners to explain the new measure. CBAM will initially only be applied to a limited number of goods where carbon leakage risk is especially high and embedded carbon emissions can be reliably measured: iron and steel, cement, fertiliser, aluminium and electricity generation. The revenues from CBAM are estimated at €1.5 billion in 2026 and are expected to increase to more than €2.1 billion by 2030. The European Commission plans to use them as a potential EU own resource and thus a contribution to the EU's budget.

Figure 1 illustrates the scope of CO₂ pricing for the five European countries with the highest CO₂ emissions embodied in domestic final demand for basic metals. In 2018 (the last year for which data is available) in most of the countries, almost two-thirds of the CO₂ emissions associated with domestic final demand for basic metals were emitted outside the EU ETS, and more than half of the emissions were emitted even outside of OECD coun-

tries (OECD, 2021). In all countries represented in Figure 1 more CO₂ is emitted in China than domestically to produce the basic metals needed for domestic final demand – although many producers of basic metals in the EU are currently preferentially treated within the EU ETS due to the free allocation of CO₂ certificates. It is therefore particularly important to target these CO₂ emissions from abroad, especially as the European Commission plans to phase out the free allocation of certificates.

The challenges of implementing CBAM

Whereas the European Commission's CBAM proposal addresses many important points – including the measurement of CO₂, a transition period of dialogue with important trading partners until 2026, non-discriminating exemptions for importers from countries with a comparable carbon pricing system, and the step-by-step phasing in of CBAM and phasing out of the currently prevailing free allocations of CO₂ certificates within ten years – it still has to cope with some serious challenges.

Export-oriented industries

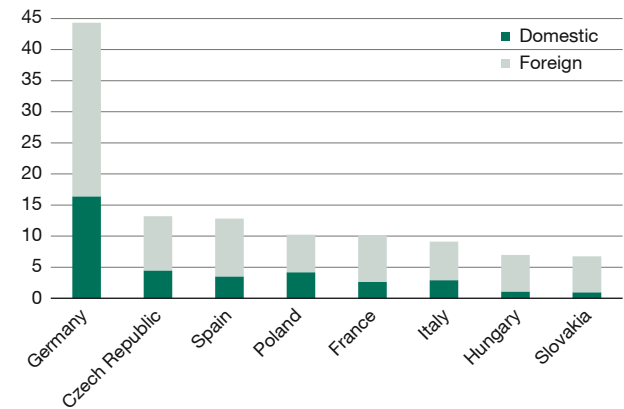
Whereas the CBAM proposal levels the playing field of the internal market, it does not offer any incentives for export-oriented industries not to move their production to pollution havens. By introducing an import fee, the proposed CBAM will raise the CO₂ costs for foreign suppliers to the level prevailing in the EU, thereby making local production for the domestic market at least as attractive as imports with regards to the costs of CO₂ emissions. However, exporting companies will still compete with producers from pollution havens in countries outside the EU ETS. The free allocation of CO₂ certificates will be phased out, making it more attractive to move production of carbon-intensive products of EU exporters abroad in order to maintain their competitiveness.

Carbon leakage in downstream industries

The CBAM proposal by the European Commission is focused on a few base materials and does not consider the incentives for carbon leakage in downstream industries which will most likely increase after phasing out the free allocation of CO₂ certificates for their suppliers. Although it is obvious that the measures should be addressed only for products for which CO₂ emissions can be adequately and reliably determined (e.g. steel, aluminium, cement), questions remain about the competitiveness of industries using these products as intermediates. Both in the domestic market and abroad, European downstream industries such as the machinery or automotive sectors compete with producers who purchase their materials and in-

Figure 2
CO₂ emissions embodied in gross exports of motor vehicles, trailers and semi-trailers, 2018

in million tonnes



Source: OECD (2021).

termediates intermediates from suppliers (e.g. from steel producers) whose costs of compliance with climate regulations are lower since their countries of origin have lower or no carbon prices. Non-EU companies from downstream industries are thus able to offer their products at lower prices, all other cost factors being equal. Thus, the incentive for carbon leakage shifts due to the planned CBAM measures in combination with the phasing out of free allowances to downstream industries. In particular, it shifts to producers not covered by CBAM who purchase their raw materials or intermediate products from sectors protected by CBAM. In the end, the producers along the entire value-added chain not covered by CBAM and the end consumer will share the additional costs – depending on the extent to which the producers can pass the higher costs on to their customers.

Figure 2 illustrates the scope of this challenge focusing on gross exports of motor vehicles, trailers and semi-trailers of the EU countries with the biggest automotive industries. Between 16.4% and 49.4% of CO₂ emissions in these countries embodied in gross exports of motor vehicles are emitted domestically. Due to the free allowances, some of these CO₂ emissions are still only partly subject to carbon pricing. Completely phasing out the free allocation of certificates would mean increasing carbon costs to almost € 2.2 billion for car exporters and their direct or indirect suppliers in the countries listed in Figure 2 – if the price of certificates remains at around €60/tonne CO₂. Applying the same price to imported intermediates will result in more than €4.6 billion of additional costs, thereby increasing the total costs to almost €7 billion. On the one hand, the costs are expected to be lower than suggested

by these numbers as CBAM will initially target only a limited number of products. On the other hand, the price of certificates is expected to increase as the number of certificates will be reduced in the coming years. Furthermore, efficiency gains are only possible in the long run, implying increasing additional costs for carbon emissions.

While the additional potential revenue from CBAM alone is estimated by the European Commission (2021a) to be between €1.5 and more than €2.1 billion annually, the additional cost for the entire value-added chain and the consumer will be much higher. This is due to the fact that the additional revenue refers only to the fee on imports and not to the additional payments by European producers for certificates after phasing out the free allocation.

Therefore, the incentive for carbon leakage shifts to the downstream industries not protected by CBAM. By moving production abroad, European carmakers and producers of machinery can increase their competitiveness since they can purchase cheaper intermediates. CBAM does not offer a straightforward solution to this problem. It is necessary to include additional products to CBAM when more evidence is available about reliable indicators for calculating CO₂ emissions in the production of more complex goods of the downstream industries. But this will happen slowly and only to a certain extent. Therefore, the price of creating incentives for the producers of steel, aluminium, etc. to invest in green technology may be carbon leakage in customer sectors of these industries.

Alternative approaches to climate protection

Whereas the Commission's CBAM proposal considers exemptions for trade partners implementing a carbon pricing system, it does not make room for the consideration of alternative approaches to climate protection as equivalent to the carbon price. The proposal takes into account carbon pricing in third countries. The CBAM will be targeted at the gap between the local price of CO₂ certificates in the EU and the price paid in the country of origin. This will avoid double explicit carbon pricing. While the European Commission recognises that many countries worldwide pursue climate protection in the form of regulations other than carbon pricing, there will be no exemptions from the CBAM for producers coming from those countries. Indeed, it is challenging to determine the equivalence between carbon pricing and non-price regulatory measures. However, by not considering exemptions for these countries, implicit double pricing will take place. This bears the risk of retaliatory measures, trade disputes and conflicts as some consider CBAM to be discriminatory compared to domestic producers.

The debate on a polluter import fee in the US provides ideas for solutions for this challenge. In the US, CO₂ emissions are targeted by a mix of federal, state and local regulations, taxes and standards, e.g. fuel efficiency standards, state-level emissions trading systems and renewable energy portfolio standards. Although there is still no official draft for the discussed polluter import fee, US Representative Scott Peters and Senator Chris Coons proposed the FAIR Transition and Competition Act (see Coons and Peters, 2021). Their idea is promising for the international trade debate due to the proposal for an approach to mutual recognition. Concretely, the US Administration should annually determine the costs for coping with the mix of regulations used as part of their climate policy approach. This would facilitate the comparability of the US regulation-based climate policy and the EU ETS. Even better would be an independent international institution established for the purpose of coordinating climate policy approaches, support for developing countries (discussed below) and mutual recognition by estimating costs of compliance with climate regulations in countries with no explicit CO₂ pricing mechanism.

Reliability of reported CO₂ emissions in imports

CBAM will have to cope with the problem of hidden information since there is no sufficient mechanism to verify the actual CO₂ emissions at the border. If no information about actual CO₂ emissions is available, the European Commission plans to use benchmarks as default values. In principle, this offers the advantage of incentivising countries to increase their CO₂ efficiency levels. However, another problem arises. The Commission will allow importers to prove that actual CO₂ emissions are lower than the benchmark as it will accept evidence about actual emissions during a reconciliation procedure. This procedure could be abused – particularly in countries with state-owned enterprises in the steel industry like China, where renewable energy has been gaining importance, it will hardly be possible to validate whether declared CO₂ emissions are reliable. The incentive emerges to declare that exported steel has been produced with renewable energy in companies where there is no transparent production documentation.

Policies to support developing countries

The measures proposed by the European Commission do not include supporting policies for developing countries. For reasons of non-discrimination and WTO conformity, CBAM does not foresee any exemptions for developing countries. Since CO₂ efficiency of developed economies tends to be higher, the introduction of the CBAM will most likely be associated with trade diversion effects that could

change the patterns of international trade. As shown in the analysis by United Nations Conference on Trade and Development (2021), the expected result is a decline in exports of developing countries in favour of developed economies. This result is indeed consistent with the target of reducing global CO₂ emissions and the aim to internalise external effects from CO₂ emissions. However, it bears the risk of dampening economic growth of developing and emerging economies. Moreover, developing countries often suffer disproportionately from the negative effects of climate change and have substantial potential for renewable energy production. It is therefore crucial to consider flanking policies by using part of the revenues generated by the CBAM to support developing countries in installing climate-friendly technology and implementing climate policy measures or, even better, implement Article 6 of the Paris Agreement to establish an efficient CO₂ trading mechanism between countries.

WTO rules

Although the European Commission has done its best to design the proposal in accordance with WTO rules, the EU is likely to be the pioneer in introducing a CBAM. The first-mover advantage of setting global standards most probably will be at least partly offset by trade disputes and retaliatory tariffs that will pose further risks to the global trading system and the WTO (Kolev and Matthes, 2021). Currently, the appointment of new judges for the appellate body of the WTO dispute settlement system is being blocked by the US as a way of expressing discontent with the way the WTO functions. Escalating trade disputes, especially with the US, cannot be solved within the WTO and the standoff could eventually bring the system to its knees. There has already been much criticism of the European CBAM proposal from numerous trading partners: the US, Australia and China, among others (Hufbauer, 2021a).

Other trade policy approaches to climate protection

Notwithstanding these challenges, the idea of a CBAM is an important stepping stone for trade policy efforts to tackle climate challenges. Trade policy has powerful instruments to create incentives for more climate protection. Furthermore, international trade is closely linked to climate protection, both due to transport-related fuel combustion and technology diffusion via exports from developed to developing countries. Carbon leakage is also just barely possible without the support of international trade as it enables companies to purchase intermediates from countries with lax climate policies or to move their production abroad and continue to sell its products in the domestic market. To reach the Paris

Climate Agreement goals of containing global warming to well below 2 degrees Celsius and ideally even 1.5 degrees Celsius above pre-industrial levels requires additional measures equivalent to a global carbon price of around US \$75 per tonne CO₂ by 2030 (Parry et al. 2021). Therefore, trade policy interventions in support of climate protection can be examined as part of the solution to this global challenge, as they have the potential to increase the incentive for other countries to adopt more ambitious climate protection targets. An internationally coordinated approach and good communication are therefore crucial to avoid trade disputes. To what extent trade policy will support climate protection remains a question of political priority setting.

Indeed, the role trade policy could play in environmental and climate protection has been stressed for decades. More than 25 years ago, the German economist Herbert Giersch (1995) pointed out that trade policy is not a suitable instrument for teaching other countries good ecological morals, and still he suggested that we will have to use it – one way or another – as leverage to force other countries to the negotiating table and to get them to cooperate. Some 20 years later, William Nordhaus (2015) developed the idea further and proposed building a climate club with high tariffs for countries not willing to cooperate on climate protection.

Brilliant in its simplicity, purposefulness and traceability, the idea for a climate club represents the basis for a fruitful discussion of the possible options to bring forward global climate protection ambitions (see e.g. Bierbrauer et al., 2021; Tagliapietra and Wolff, 2021). It has also found its way into political circles and was promoted by the German Minister of Finance and most likely the next German Chancellor, Olaf Scholz. Both the academic and the political discussion are focused on introducing a common (minimum) carbon price and/or a CBAM against non-participants in the initiative. A global CO₂ pricing mechanisms would indeed be the most efficient way to target this global challenge. However, there is not much hope for introducing a global CO₂ price as different stages of development, preferences, affectedness and economic and geopolitical interests motivate the different levels of stringency and approaches of climate policy measures worldwide. Furthermore, raising tariffs for the purpose of climate protection may be considered a violation of several WTO rules (Article I, II, VI and XVI of GATT; see Hufbauer, 2021b). Therefore, there is a need for other innovative approaches to enforce more climate protection by the means of trade policy pressure.

There are three potential solutions for the challenges described above:

International carbon price floor among large emitters (Parry et al., 2021). Similar to the introduction of a global corporate tax passed by the G20 summit in October 2021, a carbon price floor would serve as a minimum regulation thus eliminating part of the incentives for carbon leakage. Parry et al. (2021) suggest that international coordination on carbon pricing among large emitters might reduce domestic opposition against a carbon tax or cap-and-trade system. However, the introduction of economy-wide carbon pricing may remain a challenge for some of the biggest emitters like the US. Therefore, the authors allow for further flexibility to accommodate non-pricing approaches with emission-equivalent outcomes, as already pointed out in the discussion on CBAM above. Stressing that the flexibility provisions should ideally be the exception rather than the rule, they consider making room for recognising national level policy approaches that are different from carbon pricing if they have equivalent emission impacts at the price floor (subject to third-party verification). Although the approach of Parry et al. (2021) is clearly a step forward in the research on global climate policy, the incentives to implement the carbon price floor remain rather limited to the climate-related objectives targeted by this measure. Therefore, it may still be the case that these incentives are not sufficient to bring the main polluters worldwide to the negotiation table.

Sectoral approach (Bardt and Kolev, 2021). The idea of a climate club can also be implemented on the sectoral/industry level if the main producers of a certain carbon-intensive product agree on a common carbon emissions price, e.g. for the production of copper. With the common carbon price level or price floor, the additional costs could be passed through to buyers of the product as the agreement unites all big suppliers and there will be no relevant alternatives. As a good example for similar measures, the Montreal Protocol on Substances that Deplete the Ozone Layer can be considered. Furthermore, the recent agreement by the US and the EU to eliminate US steel and aluminium tariffs introduced in 2018 as well as retaliatory tariffs on the EU side could also be developed in this direction. Both US President Joe Biden and the President of the European Commission Ursula von der Leyen stressed at the end of October 2021 the need for sustainable carbon-based steel arrangements that target overcapacities worldwide as well as carbon emissions. One risk that a sectoral agreement introducing a common carbon price level or a price floor for the products harbours is that the higher price for the products coming from these arrangements does not necessarily imply carbon pricing but may be used as a profit leverage for the producers. Therefore, it is crucial to link such an agreement to climate protection.

A WTO of two speeds (Kolev, 2021). Nordhaus's (2015) idea of a climate club using tariff rate differentials to create incentives to participate and pursue climate-related objectives can be implemented by the means of trade liberalisation instead of the originally proposed tariff increase (which would suffer under lacking compatibility with current WTO rules). The club can be founded as a preferential trade agreement among like-minded countries willing to further liberalise trade and intensify climate protection. By liberalising substantially all the trade, the club will fulfil the requirements of GATT Article XXIV for the establishment of a trade agreement and create incentives for non-members to participate. The membership should, though, be linked to climate-related goals. As carbon pricing is not a viable option for many countries, the climate-related goals to be achieved can be set in terms of the reduction of CO₂ emissions, e.g. in accordance with obligations set out in the Paris Agreement. An independent institution should be responsible for the evaluation of different climate-related approaches and progress in achieving the climate-related goals set as a prerequisite for the membership. This approach can be considered trade friendly as it can promote trade liberalisation and establish a WTO of two speeds if a critical number of participants is reached. Canada, New Zealand, the EU and South Korea can be considered natural candidates to start with, as they already have bilateral agreements. However, it will be crucial to include the US as a founding member in order to create even higher incentives for participation. Reaching an agreement with the US may be a challenge; but including China, the biggest CO₂ emitter, may be an even bigger challenge.

Whatever approach is chosen, this article shows that trade policy has the potential to foster the incentives necessary to raise the ambitions of CO₂ emitters worldwide for climate protection. Nevertheless, both border adjustment measures and the idea of a trade club for climate are topics which require further detailed research and dialogue among the global superpowers to further develop the ideas and tackle the remaining challenges prior to implementation.

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