BRIEFINGS

Requested by the INTA committee

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Four briefings on

Trade-related aspects of carbon border adjustment mechanisms

Policy Department for External Relations
Directorate General for External Policies of the Union
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Possible carbon adjustment policies: An overview

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DIRECTORATE-GENERAL FOR EXTERNAL POLICIES
POLICY DEPARTMENT

European Parliament

BRIEFING

Possible carbon adjustment policies: An overview

ABSTRACT

The new European Commission has announced policies to reduce greenhouse gas emissions drastically. Reaching an ambitious target for a global good – the climate – would require a common price for carbon worldwide. This however clashes with the free-riding problem. Furthermore, unilateral policies are not efficient since they lead to carbon leakages and distort competitiveness.

To tackle these issues, the European Union can rely on different policies. Firstly, a carbon pricing of imports can combined with an export rebate to constitute a 'complete CBA' (Carbon Border Adjustment) solution. Alternatively, a simple tariff at the border can compensate for differences in carbon prices between domestic and imported products. A consumption-based carbon taxation can also be contemplated. Last, a uniform tariff on imports from countries not imposing (equivalent) carbon policies may help solving the free-riding problem.

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Authors: Dr. Cecilia Bellora and Prof. Lionel Fontagné, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)

Official Responsible: Mario DAMEN

Editorial Assistant: Jan MUYLDERMANS

Feedback is welcome. Please write to: mario.damen@europarl.europa.eu or wolfgang.igler@europarl.europa.eu.

To obtain copies, please send a request to: poldep-expo@europarl.europa.eu

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1 Introduction

The European Union (EU) initially sought to reduce its emissions through unilateral and international commitments (in particular the Paris Agreement), implemented through a cap and trade system applied to carbon-intensive industries. The new Commission, in office since December 2019, has announced more ambitious policies aiming at drastically reducing GHG emissions in the near future. Carbon neutrality in 2050 is the ultimate target of a series of complementary policies, with an intermediate target for 2030 of 40 % reduction in emissions compared to 2005.

Reaching such a target for a global good (the climate) with minimal distortions would *a priori* require imposing a *common price for carbon worldwide*. There are many reasons why this may not be feasible. In particular, rich countries have accumulated a stock of emissions over the past centuries and should support a stronger effort, while poor countries need to catch up in terms of income in order to reach the technical level they need to efficiently cap their emissions.

However, a differentiated approach faces several intrinsic obstacles:

- The EU contribution to worldwide emissions is too limited to make a meaningful difference if other big players adopt different policies.
- Alleviating the global threat on climate reduces incentives for other countries to engage in similar policies. There is an incentive compatibility problem: the last country to implement a climate policy would benefit from inaction. It would attract activity (direct leakage hypothesis) and carbon-intensive firms (pollution haven hypothesis), benefit from lower energy prices (indirect leakage hypothesis) and benefit from a cost advantage (level playing-field argument).
- The free-riding would increase the effort required of the EU to reach a given reduction in global emissions.
- This policy has negative impacts on the competitiveness of EU production in emitting sectors and, potentially, in downstream sectors as well. Therefore, European firms may lose competitiveness both in their domestic markets and in third markets (exports).

To sum up, unilateral carbon policies face distortions caused by two different types of players: countries that free-ride and producers that choose where to produce according to the differences in relative prices of carbon. Ideally, policymakers need two different policy instruments, one for each problem.

Thus, not only will a *local* policy (restricted to EU member states, for instance) hardly fix a *global* issue, but the inaction of non-participating countries will render this policy ineffective.

Central to this discussion is a problem of carbon leakages.

- *The direct leakage problem* can be explained as follows. In Europe, sectors under constraint displace their production in regions where the constraint is less binding (or even absent). In such cases, imports of goods produced in opting-out countries just replace domestic production in the EU. The global emissions due to production do not decrease (unless production technologies abroad are less GHG-emission-intensive than in the EU), while transportation produces additional emissions.
- *The indirect leakage problem* is related to energy markets: by reducing their demand in fossil energy, regulating countries depress its price, which leads indirectly to higher emissions by non-constrained countries (Felder & Rutherford, 1993; Böhringer, Voß, & Rutherford, 1998)[1]. These additional emissions constitute the 'indirect leakages'. Curbing emissions in Europe results in reduced demand for fossil fuels worldwide. Since the EU is a large importer of fossil fuels, its reduced demand leads to decreasing prices on international markets. Facing lower prices for fossil

[1] Felder & Rutherford (1993) and Böhringer, Voß & Rutherford (1998) originally identified this source of leakages.

fuels, all the regions that do not implement an environmental policy increase their use of fossil fuels and, as a result, their GHG emissions.

The current state of the relevant policies in the EU is as follows:

- The EU currently regulates emissions from the energy-intensive manufacturing sectors and from power and heat generation through the Emission Trading Scheme (ETS).
- Free allowances were initially granted to high-emitting industries in order to smooth the cost of enforcing this new policy and alleviate the induced competitiveness issue.
- Member states implement national carbon taxation systems that mainly deal with services and non-tradeable goods (housing, transport).
- No measures at the border have yet been introduced.
- The EU is facing a dynamic problem: reducing emissions today is less expensive than reducing emissions tomorrow, meaning that one might prefer a *higher* contemporaneous price of carbon in order to curb emissions as soon as possible, which goes against acceptability and competitiveness in absence of adjustment at the border.

Against this background, the EU Commission needs to design a *new policy* aiming at:

- Significantly *reducing European emissions* (meaning that its impact on production and consumption must be visible),
- *Addressing leakages*,
- *Incentivising* other countries to join its efforts.

We review in this note the possible policies at stake and their economic and environmental consequences.

2 The different policy options

Beyond the cap and trade system that is currently in force, the measures that the EU can now contemplate and combine are as follows.

2.1 Measures implemented at the border

- *Carbon pricing of imports:* the EU imposes a carbon price on its imports. *Importers have to pay an import tax. Alternatively importers have to purchase EU ETS allowances*. In both cases, this is typically what is called Carbon Border Adjustment (CBA), although the term can be used with different meanings in the related studies. This instrument *partially* tackles the competitiveness issue and the direct leakage problem. The base of the ETS allowances or of the tax is subject to debate. Ideally, the amount to be paid by importers should be based on the carbon content of the imported good. However, the carbon content of imports is notoriously difficult to measure, in particular in the case of complex value chains. Using alternative and observable bases like the average carbon content of the same product in the EU would strongly reduce the effectiveness of the instrument. Note that when importers buy allowances in the ETS, they directly influence ETS prices and, hence, the costs for domestic producers.

- The previous instrument can accordingly be combined with an *export rebate* (as for a VAT) to constitute the so-called 'complete CBA' solution. Hence, the complete CBA combines 'compensation' of imports and rebate on exports[2]. Combining a cap and trade system with free allowances instead of a CBA to reduce the burden on domestic producers, as done so far, is not efficient. *Free allowances act as an output-*

[2] The simple solution of capping domestic emissions with a tax and introducing a tariff at the border has been proposed in the 70s (see Markusen, 1975).

based rebate (an implicit subsidy to production), meaning that the output of emitting industries is accordingly above the social optimum in the EU (Martin et al., 2014).

- A *tariff that compensates for differences in carbon prices*. Its level is set to compensate for the difference in the carbon price used in the exporting country and the one used in the EU. It is important to note that, with respect to the World Trade Organisation definition, this is not a countervailing duty. This instrument differs from the CBA which relies on a tax or on an extension of the cap-and-trade system to importers. A tariff compensating for differences in carbon prices comprises all the limitations of the CBA (Böhringer, Carbone, and Rutherford, 2016). It would necessarily be applied on a discriminatory basis, which can be challenged at the WTO.

- A *uniform tariff on imports* from countries not imposing (equivalent) carbon policies targeting free-riders and based on the environmental exception of the GATT. To incentivise other countries limiting their emissions and implementing their own climate policy, the EU could set an additional import tax, small and uniform (a few p.p., for instance 2 %), on all goods imported from countries without policies or with policies having low ambitions[3]. This is not a carbon tax, in the sense that it is set whatever the good and whatever its carbon content. This mechanism only marginally reduces the leakage rate but the tax constitutes a *measure to incentivise countries* to join a club of countries sharing ambitious climate policies and to discourage free-riding. The additional cost for countries outside the club make them indifferent between bearing the cost of implementing a policy of reduction of emissions as members of the Club, or pay the tariff and not investing in climate policies. The advantage of such an instrument is that it distorts less (no differences across exporters and sectors) than other solutions proposed. The disadvantage is that it has little bite with countries with which trade volumes are small.

2.2 Measures implemented domestically

- *Consumption-based carbon taxation.* Taking stock of the legal uncertainties related to instruments that affect international trade, relying only on a combination of domestic instruments is an option. A carbon tax on consumption would target all goods, whatever their domestic or foreign origin. Tax revenues could be redistributed to production sectors, to support cleaner production technologies. Efficiency in terms of both mitigation and competitiveness of this instrument is balanced by political economy considerations of acceptability. Notice that although combining a tax at the border with a rebate on exports is 'like' a consumption tax[4], the two differ since taxation at the border is exerting a pressure on foreign exporters, hence strategically leading them to cut their export price.

- *A consumption tax can be combined with free allowances* (Böhringer, Rosendahl, & Storrøsten, 2019). *This combination is equivalent to a tariff if the good is imported* (Dixit, 1985). This is perfectly WTO-compatible and avoids the shift of consumption towards imported goods, thus fixing the direct leakage issue. It does not fix the indirect leakage problem.

3 Pros and cons of a CBA

A central proposal in the debate is the Carbon Border Adjustment (CBA). As said, we define 'complete CBA' here as the combination of a cap and trade system with a tariff at the border based on carbon content of products, and an export rebate. Notice that a cap and trade approach is preferable to a tax at the border

[3] Such a policy has been proposed by Nordhaus (2015).

[4] A complete BCA can be considered as equivalent to a consumption tax if i) the BCA taxes carbon at the exact same price as the domestic tax; ii) the carbon tax is fully passed onto the consumer by producers and iii) there is full rebate for exporters. Then such a combined BCA design is *a priori* equivalent to a consumption tax. Domestic producers and foreign producers pay the carbon tax when selling their products to domestic consumers, while no producer (domestic or foreign) pays the tax when serving foreign consumers.

because it is similar to the policy imposed to local producers, hence respecting the national treatment condition of the GATT.

- Pro-CBA argument #1: Game theory provides a rationale for implementing such a policy in the event of the uncooperative behaviour of non-participating countries. Because non-participating countries do not put a price on carbon, they implicitly subsidise carbon-intensive industries. A CBA would change the pay-offs of this game, meaning the benefits of non-cooperating (Helm, Hepburn, & Ruta 2012).
- Pro-CBA argument #2: A CBA would also reinforce the political acceptability of carbon taxation in regulating countries. Because imports are also taxed, it is easier to tax domestic producers.
- Pro-CBA argument#3: a CBA can fix the direct leakage problem if imposed on the actual carbon content of imports.
- Con-CBA argument#1: the actual carbon content of imports is not observable due to the complexity of value chains and because the exporter has no incentive to disclose it.
- Con-CBA argument#2: Whether such arguments match the legal constraints at the WTO is an open question that we will disregard here. But there are associated risks.
- Con-CBA argument#3: CBA will not fix the indirect leakage problem. Given the US decision to leave the Paris Agreement, the European Union must consider this argument seriously.

The efficiency of the CBA indeed depends on the policy environment on which it is implemented, in particular on the policies adopted both in the EU and in other countries. This environment has changed several times since the beginning of the 2000s, changing the potential contribution and the opportunity cost of a CBA. We structure our analysis following this evolution (the Kyoto Protocol, the ETS and the Paris Agreement), as reported in economic studies, to evaluate the relative importance of the pros and cons cited above according to the policy context.

Before moving to the survey, a brief reminder of the changes in global and European climate policies at stake is worth recalling. The Kyoto Protocol entered into force in 2005. It sets emission reduction targets for 36 industrialised countries for the period 2008-2012. To comply with its commitments, the EU put in place the ETS in 2005, covering heavy energy-using installations and, later on, internal airlines. The Doha amendment to the Kyoto Protocol that should cover a second commitment period, from 2013 to 2020, has been signed but not ratified yet. A separated instrument, the Paris Agreement, has been adopted in 2015. All the 195 parties that have signed the Paris Agreement contribute to climate change mitigation (contrary to what was set in the Kyoto Protocol), according to the Nationally Determined Contributions (NDCs) they report every five years. The European NDCs set an emission target also for sectors that are not covered by the ETS: these sectors have to cut their emissions by 30 % compared to 2005. Adding this target to the 43 % reduction in the emissions by ETS sectors result in a commitment of cutting emissions by 40 % below 1990 levels by 2030.

Only 36 industrialised countries committed to reduce their emissions under the Kyoto Protocol, such that leakages were expected to be large. In this context, a CBA should aim at reducing leakages while preserving, at least partially, European competitiveness. If we abstract now from the policies by countries other than the EU, the size of leakages depend on the level of ambition of the European climate policy and of its main instrument, the ETS. In the first phase of implementation of the ETS, the target seemed to be quite low, and leakages were expected to be small. In such a context, a CBA proves to be quite inefficient, in particular as an incentive for other countries to implement climate policies. Finally, under the Paris Agreement, climate policies should be more widespread. However, the withdrawal of the United States from the Agreement raised the question of the role of a CBA in dealing with a large country and emitter becoming a free-rider.

4 CBA under Kyoto

In 2010, a first study (Elliott, 2010) has compared a carbon emission pricing applied worldwide, a carbon emission pricing applied in Annex B countries only[5], and the latter solution combined with a complete CBA.

- A carbon emission price applied worldwide delivers a 40 % reduction in global emissions in 2020 with the highest tax rate.
- Applying the carbon emission price in Annex B countries only is much less efficient as it would achieve only one-third of the above reduction in emissions.
- There is a *leakage* here, in the range of *15 % to 25 % depending on the level of the tax (higher tax, higher leakage)*.
- A complete CBA (as defined above) changes the results as follows: production (consumption) increases (decreases) in Annex B countries and decreases (increases) in non-Annex B countries, which is the purpose of the policy.

This work has been replicated with various assumptions. Comparing the outcome of different models provides ranges for carbon leakages under the Kyoto Protocol (Böhringer, Balistreri, & Rutherford, 2012):

- The leakage rate ranges between 5 % and 19 %, with an average value of 12 %, under unilateral policies.
- Implementing a CBA reduces this to a range of 2 % to 12 %, with a mean value of 8 %.
- The CBA reallocates the abatement effort across regions and, in this respect, is cost-saving at the global level.
- CBA also helps improving the competitiveness of regulated industries, at least in their domestic markets.

An important element to assess whether the CBA is efficient as a policy is to take into account the opt-out of the United States (Babiker & Rutherford, 2005):

- With the US opting out, there are much *larger leakages (30 %)*, concentrating on the US (one-third of the leakages).
- A tariff at the border (not exactly a CBA as discussed above) barely reduces the leakage (28 % instead of 30 % globally) and has virtually no impact on the US-induced leakages (10 % instead of 11 %). This result is confirmed also under the Paris Agreement.

5 CBA under ETS

We now examine the impact of a CBA in presence of the *implementation of the ETS*, in a world where other countries do not implement any climate policy (Veenendaal, & Manders, 2008). In this framework, leakages depend on the ambition level of the EU. The numbers presented here are based on a study that assumes that the ETS target is an emission level reduced by 20 % in 2020, with respect to 1990.

- Leakages are limited, they are *estimated at 3 %*.
- A complete CBA would halve output and employment losses in the EU emitting sectors and reduce leakages to 0.5 %.
- A reason for why leakages are so small is the limited impact of the ETS with low ambition on the carbon price within the EU, with in turn limited impact on competitiveness and thus limited leakages.

[5] The Annex B of the Kyoto Protocol set binding emission reduction targets for 36 industrialised countries and the European Union, over the period 2008-2012. The countries not listed in the Annex B have no binding commitment, under the principle of the 'common but differentiated responsibility and respective capabilities'.

- Importantly, *border adjustment,* by increasing the cost of imports, can stop the increase in imports, if they are set based on the average emission of the exporting country.
- But border adjustment *does not prevent the decrease in European exports to third countries* (Kuik & Hofkes, 2010). Actually, *it even exacerbates these losses*: the European market becomes a less attractive destination for exporters, which divert their shipments to other regions, where competition become fiercer. Because of this increase in competition in third markets, EU exports of steel decrease by around 9 % with an EU ETS with a CBA based on average foreign carbon content. In the case of an EU ETS without any border adjustment, they decrease by around 8 %.
- Although *a CBA* indeed reduces leakage going through the 'trade channel' it *is not efficient in reducing overall leakage since it does not address the indirect leakage channel*. Interestingly, while CBA almost totally cancels sectoral leakages, its impact on overall leakage is limited, reducing it from 10.8 % to 8.2 % in the best case. Half of the overall leakage (5.9 p.p.) comes from the indirect channel: the emissions increase in the sectors that generate electricity, where emission intensity increases because of reduced fuel and other primary energy prices.
- The *implementation of a CBA may trigger retaliation* by the most affected trade partners. Exports of the main partners of the EU (in particular the US and China) may decrease by -0.3 % to -2.4 % because of the implementation of CBA. Retaliation would then change the distribution of gains across sectors in the economies involved (the EU as well as the countries that retaliate), while it would not affect aggregated impacts on macroeconomic indicators and on emissions (Fouré, Guimbard, & Monjon, 2016).

The take-home message is that a *CBA reduces sectoral leakages significantly only if based on foreign emissions*, which is actually very difficult to implement. In other words, *a CBA based on EU emissions is inefficient in curbing leakages*. It also opens the door to retaliation by big traders.

6 CBA under the Paris Agreement

How would a CBA impact emissions under the Paris Agreement?

- The unconditional pledges taken by the signatories of the Paris Agreement lead to a decrease in global emissions of 27 %. The cost of this policy, 1.17 p.p. of world GDP in 2030, is limited.
- This includes the environmental and economic costs of *leakages, amounting to 5 % of the overall emission reductions* (without any border adjustment) but not the benefits of a slowdown in the global temperature increase (Fontagné, & Fouré, 2017).

The withdrawal of the US from the Paris Agreement however profoundly modifies this picture (Bellora & Fouré, 2017).

- *An additional tariff could be targeted on US exports* and based on the carbon content of exported goods. It resembles a CBA but since it targets a specific exporter, it has a retaliatory dimension and is of a same spirit as an anti-dumping duty.
- Would all the signatories of the Paris Agreement apply such instrument, this would curb US exports by 3 % and global emissions by only 1.7 %.
- The decrease in emissions mainly comes from the transportation sector.

The take home is that *the withdrawal of the US from the Paris Agreement raises a systemic issue*: the US being a large country, where exports represent only a small share of domestic production, even a carbon tax on its exports is not effective in avoiding free-riding and limiting the impact on global GHG emissions.

7 CBA design: possible options

The previous chapters have shown that there is a possible *trade-off between the complexity of the implementation and the efficiency of a CBA, and that the withdrawal of the US from the Paris Agreement raises a systemic issue that cannot be addressed with a CBA*.

- Complexity arises because the carbon intensity is, for the same good, different across exporters.
- Complexity arises because the input-output relationships possibly involve a series of other countries with or without carbon policies.
- Efficiency is conditional to the taxation of the actual carbon content of imports.
- Level playing field requests a rebate on exports.

When designing a CBA not relying on the participation in the EU ETS, two main points are under discussion: the taxation *base* (i.e. the reference on which the CBA is applied) and the *level* of the adjustment.

Regarding the taxation base, there are 6 alternatives for setting *the reference for the carbon content to impose*, and it has to be computed for each imported good. Three levels can be considered: max, min, average, and the computation can be based on observable emissions (domestic ones) or foreign emissions (either declared or assumed):

- The max/min/average emissivity of EU producers;
- The max/min/average emissivity of foreign producers (all together or by country).

Solutions to be envisaged are as follows (Böhringer et al., 2012):

- Complex and detailed CBAs, covering more GHG and more goods, are more efficient, especially when the climate coalition is small (which will be the case if the EU alone implements a CBA).
- The administrative burden can be reduced by using regional averages for carbon content, instead of country- and product-specific values.
- Such detailed schemes are however exposed to retaliation because targeted foreign exporters will lobby for retaliation.
- Conversely, a CBA with narrow coverage (and a low taxation rate) will trigger less retaliation, but is inefficient.

Once the taxation base is set, the following important issue is the *level of the adjustment* to be applied. The question is whether a CBA can fully compensate for the difference between domestic taxation of carbon and imported goods. The problem is that the EU is a big trader. As such, taxation of imports (whatever the mechanism is) has a strategic dimension (Weitzel, Hubler, & Peterson, 2012; Balistreri, Kaffine, & Yonezawa, 2019; Böhringer, Lange & Rutherford, 2014).

- The EU would extract rent from the exporting country, because the reduced market access will incentivise foreign exporters to reduce their price.
- The increase in the price of the carbon-intensive goods would then be reduced, leading to increased consumption and inefficiency of the policy.
- The CBA could be challenged at the WTO as a strategic tool of protection: this strategic component is inconsistent with commitments under the General Agreement on Tariffs and Trade (GATT).
- To avoid this problem the level of the adjustment at the border would have to be much (i.e. around 20 %) *below* the internal taxation of carbon. Accordingly, any WTO-consistent tax would miss both the objective of level playing-field and climate change mitigation.
- If the EU decided to bypass this legal argument and set a compensation at the border above the optimal level of taxation, this would indeed curb leakages. However, the potential for decreasing leakage decreases at higher tariff rates.

Finally, in relation to the question of the tax base and level, one of the key questions discussed previously is to find a way to incentivise abatement efforts in the firms outside the coalition. One way to escape this problem is to include importers in the ETS. This is however raising technical issues and legal questions beyond this briefing note. Incidentally, notice that if importers are included in the ETS, they generate a higher demand for allowances, resulting in higher prices. Higher prices affect also EU producers purchasing allowances on the same market. These higher prices increase the cost of producing for export markets, which can be tackled with an export rebate, but also for the domestic market, in that case the export rebate is not a solution. Furthermore, with the participation of EU importers, the market for allowances would be more liquid but it would be much more difficult for the regulatory bodies to use the prices of allowances to set an emission target.

8 Conclusion

Designing a CBA raises a trade-off between complexity and efficiency. A low taxation of carbon at the border, partially compensating the internal carbon price, would help making carbon taxation politically sustainable. But it would hardly meet the environmental objective and would only partially fix the competitiveness issue.

A complete compensation of carbon content at the border raises issues in terms of information, cost of administration, potential retaliation and even consistency with respect to the WTO law due to the strategic dimension of the tax at the border. Bypassing this trade-off would request incorporating importers in the ETS system. All these problems of design are reinforced by the opting out of the US.

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Economic assessment of Carbon Leakage and Carbon Border Adjustment

Policy Department for External Relations
Directorate General for External Policies of the Union
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DIRECTORATE-GENERAL FOR EXTERNAL POLICIES
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BRIEFING

Economic assessment of Carbon Leakage and Carbon Border Adjustment

EXECUTIVE SUMMARY

The European Union is the world's largest importer of virtual CO2-emissions: its net imports of goods and services contain more than 700 million tons of CO2 emitted outside of the EU's territory. This is more than 20 % of the EU's own territorial CO2 emissions. Therefore, shifting carbon pricing away from pricing the EU's territorial emissions to pricing the EU's CO2-footprint (by means of carbon border adjustment) enhances the reach of European climate policy activities and increases their effectiveness for promoting global abatement activities.

The above result relies only on the EU being a net importer of CO2 emissions embodied in international trade. It does not rely on the answer to the question, whether stronger unilateral CO2 mitigation efforts in the EU cause the imports of embodied carbon to increase (direct carbon leakage).

Direct carbon leakage refers to the possibility that stringent unilateral CO2 policies in the EU, e.g. in the form of high carbon prices or regulatory measures, might lead to an increase in the carbon imports embodied in trade of goods and services: as European firms' relative production costs are driven up relative to firms in non-committed foreign countries, domestic production is replaced by imports and domestic emissions are replaced by foreign ones. This compromises the effectiveness of the EU's climate policies and endangers jobs and value added in exposed sectors.

Ex post evaluations of existing carbon policies arrive at mixed conclusions. On the one hand, emission pricing in the EU ETS, so far, is mostly not found to cause direct carbon leakage. On the other hand, studies based on a broader focus of climate policies (not just carbon prices) suggest that measures, e.g., in the context of the Kyoto Protocol, have indeed led to carbon leakage. In countries that have committed to emission targets, imports of goods have gone up by about 5 % and the carbon-intensity of imports has gone up by 8 %.

Ex-ante predictions by simulation models indicate that direct leakage is indeed likely. Its size depends on the difference between the EU's carbon prices and those of its trading partners. On average, studies indicate that about 15 % of domestic emission savings are offset by additional foreign emissions. However, the range of estimates is very large. In most studies, indirect carbon leakage that operates through global markets for fossil fuels, however, is quantitatively more important than direct carbon leakage operating through international markets for goods and services.

Ex-ante models show that carbon border adjustment can reduce carbon leakage. In complete setups, it can fully eliminate direct leakage. It does little to reduce leakage through energy markets, or to incentivise countries to engage into more ambitious climate policies. Results depend crucially on the design of the mechanism. Moreover, simulations also show that the adjustment burden is shifted to non-abating countries, many of which are poor and underdeveloped.

The note concludes that carbon leakage is an empirically relevant concern. Carbon border adjustments (CBAs) can lower carbon leakage occurring through goods markets. CBAs need to be treated very carefully because they might provoke retaliation by non-committed countries and because they may shift the burden of adjustment to poor countries. In the context of the EU ETS, one promising strategy could be to grant free allocations of emission permits to leakage-prone industries but combine this with a consumption tax, applied to domestic and foreign goods produced by those exempted industries.

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Authors: Prof. Gabriel Felbermayr and Prof. Sonja Peterson, Kiel Institute for the World Economy (IfW Kiel).

Official Responsible: Mario DAMEN

Editorial Assistant: Jan MUYLDERMANS

Feedback is welcome. Please write to: mario.damen@europarl.europa.eu or wolfgang.igler@europarl.europa.eu.

To obtain copies, please send a request to: poldep-expo@europarl.europa.eu

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1 The fundamental problem: Policy fragmentation

'Climate change presents a unique challenge for economics: it is the greatest and widest-ranging market failure ever seen.' (Stern, 2007). The market failure refers to the fact that decentralised mitigation efforts do not suffice to achieve the necessary amount of reductions in global CO2-emissions. The climate is a global public good; since mitigation efforts are costly, countries have strong incentives to free-ride on the efforts of other. Whether emissions are reduced abroad or at home makes no difference for the local consequences of climate change. Therefore, it is immensely challenging to commit all countries to emission mitigation policies (Nordhaus, 2015).

Nonetheless, 197 countries are parties to the Paris Climate Agreement, 187 have ratified it. By doing so, they acknowledge that 'climate change is a common concern of humankind', and they recognise that there is a 'need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge'. The parties have agreed to undertake 'ambitions efforts' 'as nationally determined contributions to the global response to climate change' (Art. 3). They have also reaffirmed the 'principle of common but differentiated responsibilities'. Moreover, obligations in the Paris Agreement are legally non-binding, and countries may not comply with their obligations because there are no sanctions for noncompliance (Kortum and Weisbach, 2016). Indeed, the free-riding problem in combatting global climate change is strong (Nordhaus, 2015). For this reason, the world is set for unilateral climate policies at the national level that are likely to be highly heterogeneous regarding their level of ambition as measured by the percentage reductions of territorial emissions. Countries not only differ with respect to their targets, they also differ with respect to the instruments.

The core problem of global climate mitigation policies is that the world has not adopted a common price for carbon emissions or a binding emission cap. For this reason, Nobel Prize winner William Nordhaus (2015) has famously called to focus efforts on creating a large coalition – a Climate Club – of countries willing to engage into mitigation policies. Based on economic theory and empirical modeling, he argues that without sanctions against non-participants there are no stable coalitions other than those with minimal abatement. By contrast, a regime with small trade penalties on non-participants, a Climate Club, can induce a large stable coalition with high levels of abatement.

Policy-makers have to deal with the fact that there is no such Climate Club and that only a subset of regions, the European Union being one of them, is willing to adopt sufficiently ambitions climate policies. The problem with unilateral, heterogeneous climate policies is that they reduce the effectiveness and efficiency of unilateral carbon policies such as CO2-prices. Moreover, by giving rise to competitiveness concerns, asymmetries undermine more ambitious national climate policy initiatives. Global climate warming can be effectively addressed by a global policy approach only.

The fragmented global carbon policy landscape lies at the core of the leakage problem. If all relevant countries of the world where to engage into comparable carbon mitigation policies such as carbon pricing through a global cap-and-trade system, no leakage problem would arise.

2 Types of carbon leakage

Carbon leakage is defined as the additional CO2 emissions of non-mitigating countries (i.e. subjected to a weak reference policy) compared to the CO2 abatement achieved by pioneering regions (i.e. pursuing additional policy ambition such as the European Union). Carbon leakage is an important aspect of the globally fragmented CO2-policy landscape as it has implications on GDP growth, trade, employment, emissions and business decisions.

Carbon leakage can take place through two main mechanisms or channels that are activated by policy-induced changes in relative prices (Arroyo-Curràs, 2015; Böhringer et al., 2017):

(i) changes of international trade in goods and services that embody carbon emissions generated during the production process, also known as direct leakage or the product market or competitiveness channel; this channel may operate or be magnified by international mobility of firms, i.e. by a capital market channel;

(ii) changes in the patterns of international fossil fuel trade, which has been called indirect leakage or the energy markets channel.

Channel (i) is theoretically explained by the pollution haven or factor endowment hypotheses. The energy markets channel (ii) results from reduced demand for fossil fuels due to unilateral action in emission abating regions, which depresses global energy prices and induces larger demand and consumption in non-abating regions. Sometimes the literature also discusses a spill-over channel which refers to the possibility that carbon policies of committed regions lead to technological progress that spills over to non-committed regions and may help lower emissions there. Notice that carbon leakage can be positive (most likely for channels (i) and (ii)) or negative (i.e., when carbon unilateral policies facilitate emission savings in non-abiding countries). In the following, attention is focused on channel (i) because of its interaction between trade and climate policy.

3 Carbon footprints, territorial emissions and carbon embodied in imports in the data

The importance of international trade is best illustrated by comparing the European Union's territorial CO2-emissions with its CO2-footprint[1]. The difference between the two measures is made up by international trade.

3.1 Territorial emissions and footprints

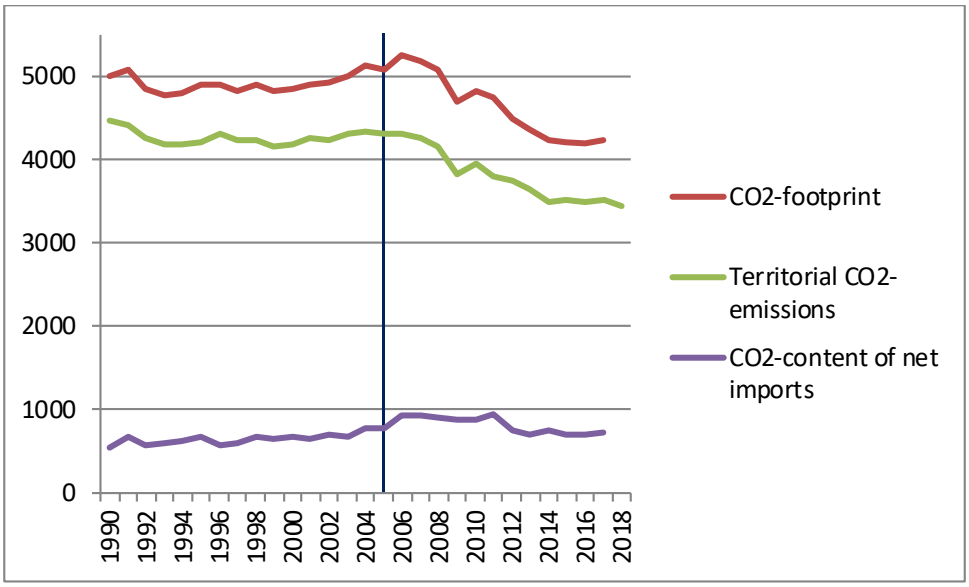
Territorial emissions are defined as the sum of all CO2-emissions that occur in a specific year on the territory of the Union. They capture emissions generated by producing goods and services within the borders of the EU. Official international CO2-accounting is based on this concept. Most concepts of CO2-pricing use territorial emissions as the basis on which levies are applied[2]. Figure 1 shows that the EU's CO2 emissions have fallen over time. From 1990 to 2017, they have decreased by 21 % (and by 23 % from 1990 to 2018[3].

The figure also shows the EU's carbon footprint. This measures the carbon content of all goods and services absorbed (i.e., consumed or invested by private or public agents) in the EU, regardless whether they have been produced on the territory of the EU or abroad. The estimation of the carbon footprint requires tracking the carbon content of goods and services produced abroad and absorbed in the EU, the carbon content of goods and services produced in the EU for domestic absorption, and the carbon content of goods and services produced in the EU for foreign absorption. The measure requires knowledge of foreign direct and indirect emissions associated to the production of goods and services. Since intermediate inputs are often imported from abroad, and those inputs may contain further inputs from yet other countries, the estimation of the CO2-footprint makes use of a world input-output table for each year in order to capture

[1] In the following the term CO2 generically refers to greenhouse gases in CO2-equivalents.
[2] The following discussion does not hinge on whether carbon pricing is implemented via CO2-taxes or emission trading.
[3] Note that due to different methodologies, data published by the Global Carbon Project (2019) differs slightly from official EU data (as reported, e.g., by Eurostat or the European Environment Agency); see Friedlingstein et al. (2019)

global production networks[4]. The CO2-footprint is often also referred to as CO2-consumption (as embodied in goods and services).

Figure 1 Estimates of European Union CO2-emissions, CO2-footprint and CO2-imports, in million tons of CO2 per year



Source: Global Carbon Project (2019), own calculations and illustration. Note: emission data differ from official EU data due to different treatment of CO and CO4 emissions. The EU is defined over 28 members (as of 2019). Vertical line indicates the start of the EU Emission Trading System (ETS) in 2005.

Figure 1 shows that the CO2-footprint of the EU is higher than territorial emissions, implying that the EU is a net importer of CO2. In other words, imports into the EU are related to higher CO2-emissions abroad than exports from the EU to foreign countries. The footprint has fallen by 15 % from 1990 to 2017. Thus, the reduction in the carbon footprint has been less pronounced (by 6 percentage points).

3.2 Carbon trade

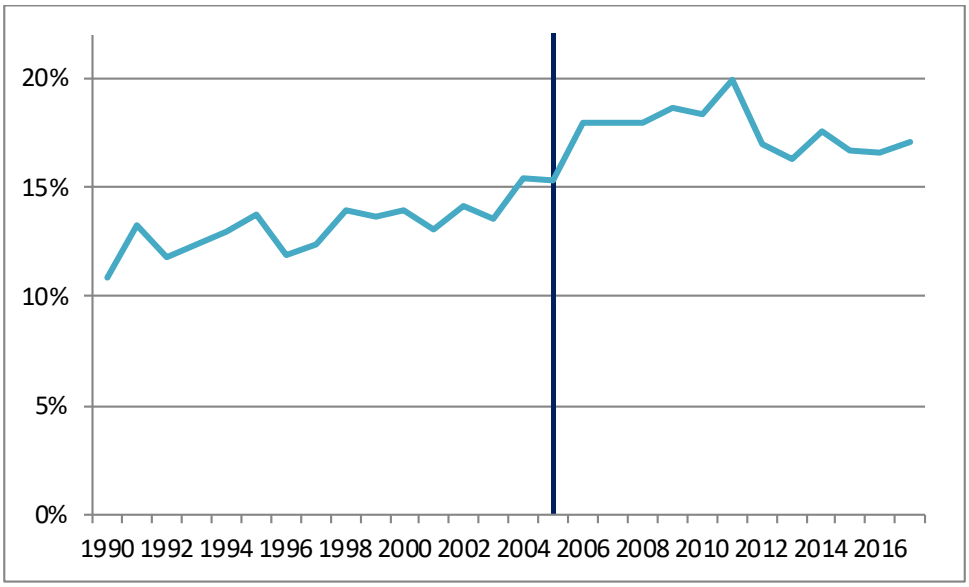
Figure 1 plots net imports of CO2[5]. Net imports of CO2 are the difference between the footprint and the territorial emissions. They have increased by 33 % between 1990 and 2017. The fact that, in 2017, through trade of goods and services, the EU has been importing more CO2 than it has been exporting, is despite it being a net exporter of goods and services of about EUR 167 billion. The CO2-content embodied by imports into the EU must be much larger than the CO2-content of domestically produced goods[6]. In 2005, when the EU's ETS came into force, the data suggest a small uptick of net carbon imports, which would be consistent with the idea that unilateral climate policy leads to carbon leakage.

[4] See Peters et al. (2011) or Aichele and Felbermayr (2012) for details on the procedure.

[5] Peters and Hertwech (2008) refer to net carbon imports as a weak version of carbon leakage. We prefer reserving the term 'leakage' to situations, where delocalisation of carbon emissions is explicitly triggered by differential climate policies.

[6] Eurostat calculations of the EU's carbon footprint make the assumption that foreign production is exactly as carbon-intensive as EU production. Empirically, this is a very misleading assumption. World Bank data reveals that the CO2-intensity of GDP (measured in kg territorial CO2-emissions per 2010 US$ of GDP) was 0.18 in the European Union (ranging between 0.08 in Sweden and 0.86 in Estonia), but 0.32 in the US or 1.24 in China, 1.69 in Ukraine, and 0.49 on average at the global level. Hence, the Eurostat methodology results in very small difference between the footprint and territorial emissions. Moreover, as the EU has become a net exporter of goods and services since 2008, implied carbon imports have fallen and turned negative (i.e., the EU is a net carbon exporter); see https://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics_-_carbon_footprints#Carbon_dioxide_emissions_associated_with_EU_consumption.

Figure 2 CO2 embodied in net imports as a share of EU carbon footprint, %



Source: Global Carbon Project (2019), own calculations and illustration. Vertical line indicates the start of the EU Emission Trading System (ETS) in 2005.

Figure 2 plots the EU's CO2-emissions embodied in net imports as a percentage share of the EU's CO2-footprint and finds that it has been increasing from 11 to 17 % from 1990 to 2017. The recent reduction is due to lower CO2-intensities of production in main sources of imports, most notably in China.

In 2017, with 728 million tons, the EU is the world's largest net importer of CO2-emissions. The US, another major importer, accounts for 416 million tons. This is because the US has a higher average CO2-intensity of production so that its territorial emissions and its footprint coincide more closely. China, in turn, is the largest net exporter of CO2: its net exports amount to 1 290 million tons. China has reduced its net exports from 1 503 million tons in 2014.

Of course, at the global level, territorial emissions and the footprint coincide. But at the sub-global level, implicit trade in CO2 is quantitatively important and the EU plays a major role. Table 1 shows that the EU's territorial emissions accounted for about 9.8 % of global emissions in 2007, the CO2-footprint accounted for 11.8 % and net imports of CO2 for 2.0 %.

3.3 Implications for carbon border adjustment

As a consequence, it EU carbon pricing (through the ETS and national regimes) is applied to the carbon footprint rather than to territorial emissions, the share of global emissions addressed by EU policies grows from 9.8 % to 11.8 %. A border adjustment mechanism can, partly or completely, achieve this by focusing on pricing CO2 emission associated to EU absorption (consumption and investment) activities rather than on emissions related to EU production. A mechanism that subjects the carbon content of imported goods and services to EU carbon pricing and exempts the carbon content of exported goods and services would achieve this objective.

Naturally, by moving a larger share of global emissions under the EU's carbon pricing regime, and assuming that the EU has more stringent carbon policies than the average trade partner the impact of the EU's mitigation policies on global emissions increases. ([7]) This result is entirely independent from the question

[7] This assumption is validated by Botta, E. and T. Kozluk (2014) and the updated results published in the OECD's Environmental Policy Stringency Index on https://stats.oecd.org/Index.aspx?DataSetCode=EPS.

whether more stringent climate policies (e.g., higher carbon prices) would further increase net imports of embodied CO2.

Table 1 EU CO2 emissions: territorial measure versus footprint, 2017

	CO2-footprint	Territorial CO2-emissions	CO2-content of net imports
in million tons	4 246	3 518	728
in % of global emissions	11.8 %	9.8 %	2.0 %

Source: Global Carbon Project (2019), own calculations and illustration.

4 Does carbon pricing cause leakage?

To what extent do unilateral climate policies drive up net imports of CO2, thereby crowding out domestic production? The evidence presented in Figure 1 and Figure 2 cannot answer this question. Too many other factors determine whether countries are net importers or exporters of carbon-intensive goods. For example, countries running large trade deficits, ceteris paribus, should also be net importers of carbon. Countries specialised in the production of CO2-intensive manufacturing activities naturally are net exporters of carbon while countries specialised in services are net importers. While unilateral climate policies may of course influence trade balances and specialisation patterns, they are by no means their only drivers. Moreover, there are issues of reverse causation: countries being net exporters of carbon – for whatever reason that may be – have little interest in adopting aggressive carbon pricing policies as this reduces their comparative advantage in those industries. So, there may be many reasons for a correlation between carbon imports and carbon pricing, but the latter may not cause the former. To address this issue, one has to engage into more formal economic modeling. There are two broad research strategies:

(a) Analyses of carbon leakage and of carbon border adjustment policies in simulation models of the world economy, so called Computable General Equilibrium (CGE) models. These models typically answer how specific future carbon policies affect outcomes: trade flows, carbon emissions nationally and globally, and welfare. In most cases, CGE analysis engages in an ex ante analysis.

(b) Econometric modeling of existing carbon policies engage in ex post analyses. That is, they ask how policies such as the European Emission Trading System or international agreements such as the Kyoto Protocol have affected carbon leakage. Those studies focus on trade flows and carbon emissions embodied in trade flows, as well as on aggregate emissions.

4.1 Factors driving direct carbon leakage

The mechanism that receives most attention is the competitiveness channel discussed in section 2 (direct leakage) and operates through international markets for goods and services. A unilateral carbon price in one region of the world (e.g., in the EU) would increase the production costs of goods whose production involves emissions of CO2 but not in countries or regions that do not commit to carbon pricing or other equivalent carbon policies. Hence, the relative price of EU goods would increase relative to foreign goods. Users – consumers or investors – of those goods would substitute towards goods produced in foreign countries and away from domestic production. Firms would increase the capacity of production abroad and reduce it at home. The output of carbon-intensive industries at home falls while that of non-intensive sectors expands; CO2-emissions fall. Abroad, the opposite happens: output of carbon-intensive industries goes up while that of non-intensive sectors falls; CO2-emissions increase. The leakage rate measures the share of domestic emission savings that is offset by foreign emission increases. That share can be larger than 100 % when foreign production is particularly CO2-intensive. In any case, leakage reduces the

effectiveness of domestic carbon policy because the domestic effort does not reduce global carbon emissions one-to-one.

This mechanism works regardless of how CO2-pricing is implemented, either via a unilateral cap-and-trade system or via unilateral CO2-taxes. If both regions have the same CO2-prices, relative cost competitiveness does not change. Unilateral carbon pricing leads to sectoral adjustments that go beyond those that would arise if all countries had the same CO2-prices and/or a common cap on carbon emissions. The literature finds that direct leakage is larger,

(i) the smaller the coalition of countries committed to carbon policies is relative to the world and the larger differences in CO2-prices between regions or countries are;

(ii) the more carbon-intensive the production of goods or services is (based on direct and indirect (through intermediate inputs) CO2-emissions;

(iii) the lower trade costs – tariffs and other frictions such as regulatory barriers or transportation costs – are;

(iv) the more easily substitutable foreign and domestic outputs are, that is, the stronger (the more elastic) demand reacts to price changes;

(v) the more competitive goods markets are so that firms cannot easily pass-through higher costs to users at unchanged quantities.

Industries differ with respect to these criteria; hence, the likelihood of direct leakage differs across industries. To make the risk for carbon leakage more operational, the literature classifies industries according to their CO2-intensity, their elasticity of demand, and the larger their trade exposure. The larger the share of fossil fuels in the cost base of firms, the more price competitiveness suffers as a consequence of CO2-prices. The higher the elasticity of demand, the more strongly demand shrinks as prices (driven by higher costs) go up. And the larger export shares are, the bigger the threat to domestic value added and employment.

4.2 Core findings from simulation studies

There is a relatively substantial literature presenting studies that simulate the effectiveness of unilateral climate policies in models featuring international trade, and, in some cases, international mobility of capital and firms. One can distinguish two types of approaches which matters for the findings:

(i) Computable General Equilibrium (CGE) modeling analyses, with many sectors and countries, which take an economy-wide perspective and explicitly model how single industries are embedded in national and international value chains, taking impacts of macroeconomic aggregates into account, and

(ii) Partial equilibrium models which focus on single industries, often in single countries, taking macroeconomic aggregates as given.

Both of these approaches have advantages and disadvantages; ideally they should be used in concert. CGE models tend to forecast lower leakage rates because they provide results for a blend of sectors that are more and less heavily exposed to leakage, while partial equilibrium models tend to focus on individual sectors expected to be particularly vulnerable to carbon leakage.

Results from CGE models

Leakage rates are in particular quantified with the help of CGE models in ex-ante studies of for hypothetical climate policy scenarios such as meeting the Paris targets. The early CGE-literature, e.g., Babiker (2005) estimates leakage rates as high as 130 percent, meaning that domestic emission savings are more than

offset by additional emissions abroad. These results have been dismissed by newer research and hold only under special circumstances such as wide-spread increasing returns to scale production technologies and oligopolistic market structures.

Branger and Quirion (2013) have produced a very useful meta-analysis of the large and sprawling CGE literature on carbon leakage and carbon border adjustments. They analyse 25 studies with a total of 310 estimates of carbon leakage ratios. The typical range of carbon leakage estimates is from 5 % to 25 % (mean 14 %). Similarly, Böhringer et al. (2018) summarise their survey of the existing CGE literature by saying 'Average leakage rates in CGE studies of comparable climate policy regulations range between 10 and 30 percent.' These estimates do not include carbon border carbon adjustment (CBA) measures. With those in place, leakage is reduced to – 5 % to 15 % (mean 6 %). Models differ with respect to structural assumptions and parametrisations; also the specific implementation of the CBAs differ, but the averages do signal where the economic analysis are pointing to.

Branger and Quirion (2013) summarise the general findings of the literature very well. The study also shows that leakage ratio falls with the size of the coalition of countries that undertake ambitions carbon policies. Among different CBA options, the extension of CBAs to all sectors and the inclusion of export rebates are the most efficient features in the meta-regression model to reduce the leakage ratio. All other parameters being constant, CBAs reduce leakage ratio by 6 percentage points.

Results from industry-level studies

Concerning studies based on partial equilibrium models, Partnership for Market Readiness (2015) presents a very complete overview. The many existing studies focus on particular countries and sectors, where the industries that are most vulnerable to carbon leakage have received most attention. These include the cement, clinker, steel, aluminum, oil refining and electricity sectors.

The partial equilibrium models typically generate large leakage rates, often up to 100 %. These rates are substantially larger than those obtained in the CGE literature. The reason is that the partial equilibrium models focus on very special sectors that feature a high degree of vulnerability but that do not receive a high weight in country-wide assessments. It is perfectly possible for single industries to displace leakage rates of 100 % while the CGE analysis, focusing on the same carbon policies, may find leakage rates that are an order of magnitude smaller. Moreover, the CGE analysis and the partial equilibrium models differ with respect to crucial assumptions. The latter mostly do not allow for products to be differentiated with respect to their origin (European steel is deemed identical from a user perspective than imported steel) and assumes oligopolistic behavior of firms. These features drive up leakage. CGE models typically assume that users differentiate between origins of products and feature perfectly or monopolistically competitive product markets; these characteristics lower leakage.

A shortcoming of both model types is that technological innovations induced by climate policy are typically not captured. This means that those frameworks may overestimate the amount of leakage and the absolute value of welfare effects; see Gerlagh and Kuik (2014). Thus, the spill-over channel alluded to in Section 2 is not covered.

4.3 Econometric analysis of trade flows and carbon leakage

The carbon leakage problem is a special case of the 'pollution heavens' problem. For more than 40 years, there has been econometric research on the question whether countries with relatively weak environmental regulation attract pollution intensive production. Levinson (2008) provides an extensive survey of the literature and its findings. He argues that early empirical work on the pollution haven

hypothesis had some methodological shortcomings[8]. Most of the studies found small insignificant effects of environmental regulations, a few found counter-intuitive positive effects, and none found robust significant support for the pollution haven hypothesis. This early literature is summarised in Jaffe et al. (1995, p. 157): 'Overall, there is relatively little evidence to support the hypothesis that environmental regulations have had a large adverse effect on competitiveness.'

In contrast to the earlier cross-section studies, newer work based on more advanced methodologies has tended to find statistically significant, reasonably sized evidence of pollution havens[9]. It is catalogued in detail by Brunnermeier and Levinson (2004), and summarised in Copeland and Taylor (2004, p. 48), who write that 'after controlling for other factors affecting trade and investment flows, more stringent environmental policy acts as a deterrent to dirty-good production'. Larger and more significant trade flow effects are found for less pollution-intensive industries, see Ederington et al. (2005), Levinson and Taylor (2008), and Levinson (2010). An explanation that has been put forward is that pollution-intensive industries tend to be relatively immobile, while less pollution-intensive industries tend to be more labor-intensive and geographically 'footloose'.

The empirical literature on carbon leakage is possibly undergoing a similar graduation. Both the older and the newer ex post evaluation studies suffer from three additional problems which can be addressed only in general equilibrium simulation models. First, the studies rely on linear (logarithmic) approximations; predictions, e.g., about the effects of policies that are much more stringent than the ones evaluated in historical data, are therefore problematic. In particular, in the presence of fixed costs of relocation, the incentives for production relocations increase over proportionately with the stringency of the policy measure. Second, the studies compare sectors, regions, or industrial installations that are covered by measures with differing intensity. Effects of measures (i.e., more stringent reporting requirements) that affect all units of observation regardless of how and whether they are specifically affected by a measure cannot be identified. Third, the studies raise questions about external validity: can results obtained for certain sectors, regions, and time periods be credibly used to inform current policy making?

Contrary to modelling studies that can assess hypothetical climate policy scenarios with very stringent unilateral climate policies empirical studies can only assess carbon leakage of existing policy sets. Leakage rates that are found in these studies are significantly lower than those reported above which can to some degree be attributed to the analysed scenarios.

Evidence on the European Emission Trading System

Since 2005, the ETS is a cap-and-trade system that covers CO2 emissions from manufacturing, electricity production and aviation (for flights within the EU). It sets a limit to territorial emissions and this limit gradually falls over time (by 2.2 % after 2020). In early years, emission allowances were mostly distributed freely; in phase 3 (2013-2020) of the ETS, by default, they are auctioned off. Only installations in sectors deemed exposed to carbon leakage receive free allowances. Allowances are traded on a market, and the fact that they are limited generates a positive price.

According to ETS Directive Article 10a, a sector is defined as 'exposed' to carbon leakage if additional costs caused by the ETS, as a share of gross value added, is at least 5 % and the sector's trade intensity with non-EU countries (imports and exports) is above 10 %. Alternatively, a sector is 'exposed' if additional costs are at least 30 % or the non-EU trade intensity is above 30 %. Installations in exposed sectors are eligible to receive free allocation of permits, which is determined by multiplying the production quantity of a product by a benchmark carbon coefficient for that product. Benchmarks are based on the performance of the most

[8] The studies used cross sections of data and made no attempt to control for unobserved heterogeneity or simultaneity.

[9] This included the use of panels of data and fixed effects models to control for unobserved heterogeneity, and instrumental variables to control for simultaneity.

efficient installations, so only the most efficient installations receive free allowances to cover their entire needs. For installations in non-exposed sectors, free allocations are gradually phased out by 2030. Before phase 3 of the ETS similar but slightly different rules applied; in phase 4, another modification of the rules will kick in but the overall logic is maintained.

The allocation of free allowances reduces the danger of carbon leakage by reducing average costs of carbon intensive producers in the EU. Because only the most efficient producers receive full allowances, incentives to reduce emissions are maintained despite the existence of free allocations. During long periods of the existence of the ETS, prices for EU emission allowances have been very low. This has several reasons; see Grosjean et al. (2016). One important driving factor, of course, was the recession of 2009. However, national policies aimed at promoting the production of renewable energy have also led to low prices as they have reduced demand for EU emission allowances. Thus, during most of the EU ETS' history, price signals have been relatively low.

Thus, it is probably not overly surprising that ex post modeling analyses of the EU ETS have generally found little evidence of leakage (Partnership for Market Readiness, 2015). The results are consistent, however, with the analyses of the impact of other local environmental policies that have been observed for a longer time in a wider range of countries. Ever since the 1970s they were also feared for causing the potential migration of industry to 'pollution heavens' abroad, which has not materialised on a significant scale. Environmental policies have even been found to induce innovation that offsets part of the cost of compliance with the environmental policy. This is not surprising for economists who have long observed that firms do not compete on costs only, but on the overall efficiency of converting various inputs (including knowledge) into high-value products and services. Cost competition is more important to sectors offering homogenous products and commodities.

Indeed, Sato and Dechezlepretre (2015) find that emission cost imposed by the EU ETS are below 0.65 % of material cost for 95 percent of European manufacturing sectors. Thus, the additional cost introduced by European emissions policy is comparatively small. Sato and Dechezlepretre add that firms relocating production to a foreign region must pay fixed relocation costs. Relocation also has opportunity costs in the home market, such as a weaker market position and less influence in bargaining with policy makers. Moreover, emission policies often combine costs and subsidies. For example, European manufacturing firms received large amounts of free emissions allowances ('free allocation'), which may be sufficient to counter the leakage risk. The data of the authors reveal that most sectors received a net subsidy from emissions trading, once free allocation is taken into account. Finally, the business literature predicts an inverse effect of environmental regulation (Porter hypothesis): the negative competitiveness effects of unilateral environmental policy may be offset by successful incentives to innovate in lower-carbon products, spurring a broader productivity increase for firms affected by environmental policies. Innovation may be incentivised through the emission price signal or by providing explicit R&D subsidies in parallel.

Very recently, Chevallier and Quirion (2017) conduct an econometric analysis of carbon leakage resulting from the EU Emission Trading Scheme (ETS) on the cement and steel sectors. They find no evidence that the EU ETS has had any effect on net imports in these energy-intensive sectors. Generally, newer papers confirm the general finding in Partnership for Market Readiness (2015) that there is no evidence supporting strong leakage effects due to the EU ETS.

Sato and Dechezlepretre admit that 'it is difficult to know for certain what explains the ex post modeling result of carbon leakage in Europe so far. While it could mean that the risk of leakage is negligible for the reasons described above, it could also be explained by the technical difficulties in identifying impacts over a relatively short period of time; or because carbon prices have been modest; or because of the efficacy of leakage-prevention mechanisms that have been part of policy design from the outset.'

Nägele and Zaklan (2017) use a so called gravity equation for the carbon dioxide content of trade, which accounts for intermediate inputs, both domestic and imported to study how trade flows and their carbon content of trade is affected by the EU ETS. Their analysis suggests that carbon leakage did not occur due to the EU ETS per se but that there was carbon leakage due to other climate policy measures that committed countries implemented, most likely, regulations.

Evidence on climate policy on trade flows and emissions

The literature cited above suffers from a number of problems. It draws inference on past experience, and it focuses exclusively on carbon pricing. However, in the past, over long periods, CO2-prices in Europe have been very low. It would be surprising if they triggered strong responses. In contrast, many EU countries and the EU implemented ambitious regulatory measures to curb CO2-emissions (e.g., EU wide fleet emission targets for cars), installed subsidies for clean energy production and financed those using levies on electricity users (e.g., Germany's Renewable Energy Sources Act), and so on. Many of these measures did impose additional costs on producers, sometimes explicitly, more often implicitly. Therefore, to capture the effects of climate policies on trade flows, one needs to cast a wider net.

There is an empirical literature that does this. It compares outcomes in countries that have made commitments under the Kyoto Protocol and hence have had to implement appropriate policies with countries that did not underwrite such commitments.

Grunewald and Martinez-Zarzoso (2016) show empirically in a large panel of countries that commitments in the context of the Kyoto Protocol have indeed led to lower territorial CO2 emissions. This is in line with Aichele and Felbermayr (2012). However, those authors analyse not only territorial emissions but also the carbon content of domestic absorption (consumption and investment). They use a large panel of countries and a so called instrumental variables estimator to identify the causal effect of ratification of binding Kyoto commitments on the carbon footprint and territorial emissions. They show that Kyoto commitment has reduced domestic emissions in committed countries by about 7 % but has not lowered carbon footprints. Instead, the share of imported over domestic emissions went up by about 14 percentage points. These results suggest that the Kyoto Protocol may had the intended effects on domestic emissions but had no effect on world-wide emissions as footprints have not fallen. Such evidence is consistent with carbon leakage.

The mentioned papers do not explore the channels through which Kyoto commitments have lowered territorial emissions. In particular, crucial for the leakage debate, those papers do not make the role of international trade explicit. Finally, there is one paper that asks how the collection of policies have, on average, affected the carbon content of trade between countries with binding commitments from the Kyoto Protocol and those without. Aichele and Felbermayr (2015) use a so called gravity equation for the carbon dioxide content of trade, which accounts for intermediate inputs, both domestic and imported. They use a large panel database of the carbon content of sectoral bilateral trade flows and deal with the non-random selection of countries into the Kyoto Protocol. They find that binding commitments under Kyoto have increased committed countries' embodied carbon imports from non-committed countries by around 8 % and the emission intensity of their imports by about 3 %. The conclusion, therefore, is that policies triggered by the Kyoto Protocol have indeed led to leakage.

The policy that has been analysed most extensively is the European Emission Trading System to which we thus denote an extra paragraph.

5 Addressing carbon leakage

5.1 A 'complete' carbon border adjustment (CBA) regime

In a world where only a subset of countries engage in carbon pricing, direct carbon leakage can be fully neutralised by a regime that subjects the carbon content of imports of goods and services to the same carbon price as applied to the carbon content of domestic production, while at the same time rebating paid carbon taxes or allowances to exporters according to the carbon content of their goods. Such a regime effectively shifts the burden of carbon pricing away from domestic production to domestic absorption (consumption and investment). As consumers are not geographically mobile, they cannot escape the carbon price. Production, in contrast, can shift from the EU to foreign places. With identical carbon prices applied to the CO2-content of all goods and services regardless of their place of origin, carbon leakage disappears. In such a situation, the EU carbon policy does not induce any substitution effects and, thus, minimises inefficient trade diversion or evasion effects. Compared to a situation without any carbon pricing in any country, this regime has no first order effects on relative prices as domestic and imported goods and services are treated alike. Compared to an initial situation where carbon prices apply to domestic production only, switching to the described 'complete' regime hurts trade partners because demand for their goods in the EU fall; this lowers their exports to the EU and their terms-of-trade fall[10]. However, the regime corrects a deterioration of EU terms-of-trade that occurred when the ETS was introduced in the first place. The 'complete' regime is similar to a value added tax, which subjects any good, regardless of origin, to the same tax; it is different to a carbon tariff, which, by definition, discriminates against foreign producers.

Böhringer et al. (2018) study the effects of such a carbon tariff. They look at the effects of taxing the carbon content of imports in a CGE model. They refer to this as 'embodied carbon tariffs', since a tax is applied to the carbon content of imports which is not (necessarily) also applied domestically. They show that such a policy shifts the burden of adjustment to foreign countries, mostly by deteriorating their terms-of-trade: as foreign goods become more expensive, demand for them falls, and foreign producers typically find it optimal to adjust their prices downwards. Such a policy imposes incentives on foreign producers to reduce emissions as this lowers their effective tax burden. It also leads to trade diversion: carbon intensive goods are rerouted to other markets. As with other beggar-thy-neighbour policies[11], it can result in reduced global welfare. Böhringer et al conclude that such tariffs can represent a tempting policy option for countries that seek to reduce their domestic compliance costs under the pretext of eliminating carbon leakage from their unilateral climate policy initiatives. However, the tariff could be used as a means to sanction countries that are not willing to join the Climate Club as suggested by Nordhaus (2015).

Moreover, there are important implementation issues of the complete CBA. The carbon content of foreign goods would have to be identified which is probably bureaucratic; with return to this important concern below. Foreign countries may feel treated unfairly and engage into retaliation. Finally, there may be issues regarding the compatibility of the regime with respect to WTO rules.

[10] Terms of trade describe the relationship between the prices obtained (on average) for export goods relative to import goods. Higher terms of trade improve the purchasing power of a country and, hence, welfare.

[11] 'Beggar-thy-neighbour' policies are unilateral strategies that aim at transferring income or economic rents from foreign countries to the home country, e.g., by manipulating the terms of trade. The term goes back to Adam Smith (1776).

5.2 Smart hedging against carbon leakage

Recently, Böhringer et al. (2019) have proposed a border adjustment scheme which can, at least in theory, fully replicate the complete regime described above, while offering advantages regarding the legal, diplomatic, and technical feasibility.

As described above, the existing EU ETS already contains provisions to mitigate carbon leakage. This happens with the help of output-based allocation (OBA) of allowances to exposed industries: in proportion to their actual emissions companies in such industries get all or part of the needed allowances for free; incentives are maintained by indexing OBAs for all firms to the most efficient establishment. This strategy lowers average costs of European producers and, thus, improves their international competitiveness relative to a situation without free allowances. However, it has the disadvantage that it leaves certain carbon-intensive goods entirely exempted from carbon pricing so that their domestic (and global) use remains too high. Böhringer et al. (2019) show that in a situation with an ETS combined with OBA, it is optimal to impose a consumption tax on the goods that are entitled to OBA, where the tax is equivalent in value to the OBA-rate. Then, using a multi-region, multi-sector computable general equilibrium (CGE) model calibrated to empirical data, they quantify the welfare gains for the EU to impose such a consumption tax on top of its existing ETS with OBA. They run simulations to account for uncertain leakage exposure of goods entitled to OBA. The consumption tax increases welfare whether the goods are highly exposed to leakage or not. Thus, policy makers in regions with OBA can only gain by introducing the consumption tax. Because the OBA-cum-tax system is already up and working, without major concerns by trade partners or the WTO, it may be preferable to the complete CBA regime described in 5.1.

Analytically, it is possible to show that the OBA cum tax system can be designed such that it completely replicates the 'complete' CBA. This would mean to calibrate the free allowances to industries and the tax in a way that gives exporters the same effective rebate as exempting their exports from a universal carbon pricing system without OBA. Doing this requires the same information as in the 'complete' CBA. If carbon contents of imports and exports are not known exactly, and the EU has to apply some benchmark or average to calculate fees and rebates, the 'complete' CBA can easily become the subject of litigation because firms may complain about discriminatory treatment. The OBA cum tax system may be less vulnerable to this problem, for example, if the consumption tax does not differentiate between different origins of the goods in question. Nonetheless, it goes some way into reducing carbon leakage and extending the global reach of EU climate policies.

5.3 Positive and negative economic effects of CBA

A well-designed CBA mechanism decreases leakage, and can therefore be expected to raise welfare in the countries unilaterally undertaking climate policy. But it is no substitute for universal global carbon pricing because it cannot undo indirect leakage. The CGE literature suggests that the welfare effects of carbon leakage are relatively minor in the first place. Branger and Quirion find estimates of the impact on welfare (usually proxied for by output or GDP) of the unilaterally acting countries range from –1.58 percent to 0.02 percent without a CBA mechanism and from only -0.9.percent to even a positive value of 0.4 percent with a CBA system in place[12]. However, shoring up international competitiveness by means of a CBA regime may be a necessary political condition for implementing any ambitious carbon pricing scheme.

Clearly, there are also costs associated to CBA. The most important two types of costs refer to red tape and to the risk of retaliation.

12 To facilitate comparisons of different policy measures, these welfare impacts do not account for the environmental benefits of lower global greenhouse gas emissions. Partial equilibrium models are typically not able to provide global welfare estimates.

Red tape

On the other hand, any CBA system will involve possibly very substantial administrative burdens that the empirical literature is not accounting for. These come in various guises and depend on the design of the CBA regime. Since no CBA has been put in place in any country, direct empirical evidence on such costs is not available. In the complete CBA regime firms would have to reveal the CO2-content of their products and the information provided by them would have to be verified by authorities. What is more, the more complex a good is, the harder it is to assess the true CO2-content of it. This would require tracking and verifying the entire production chain, both domestically and abroad. This seems a daunting task.

However, there is some empirical evidence on the bureaucratic costs associated to so-called rules of origin (RoOs) required in preferential trade agreements. These rules define under which conditions a good exported from some country is seen to actually originate from that country. For example, EU producers wishing to export duty free to Korea have to satisfy the RoOs laid down in the EU-Korea free trade agreement. These rules can prescribe minimum value added thresholds that exporters have to abide by. Satisfying and documenting those RoOs is costly; often so much that firms prefer to incur tariffs rather than to document the RoOs. Anson et al. (2005), Carrère and Melo (2006), and Estevadeordal (2000) have attempted to quantify these costs and find that they can amount to several percent of the export value. Hence, substantial red tape exists in other trade policy areas as well. Moreover, it would be advisable to concentrate a BCA system on industries which are most heavily affected by carbon leakage and where the unavoidable red tape compares favorably with the benefits of achieving a level playing field. The bureaucratic burden is probably highest with the 'complete' BCA described above; alternative regimes such as the OBA-cum-tax scheme save on administrative costs but fare less well in terms of effectiveness and efficiency. The EU will have to strike a delicate balance between administrative costs and effectiveness/efficiency.

Retaliation

Moreover, countries not willing to price carbon emissions themselves may react to a European BCA by imposing countermeasures, for example in form of punitive tariffs. This may, of course, happen regardless of such action is compatible with existing international law or not. The economic damage of such measures by foreign nations can be very sizeable. In fact, the mere threat of imposing tariffs can induce producers to revisit their location decisions. For example, one response of European car manufacturers to US threats to impose car tariffs of 25 percent has been to move favor serving the US market by local production rather than by exports. The damage in real gross value added in the Europe automotive industry of a 25 percent US tariff on cars and car parts is estimated to be about 10.4 billion Euros per year (in prices of 2014) and can easily be more than that in the short run; see Felbermayr and Steininger (2019). A full-blown trade war with the US can cost the EU economy several multiples of this; see Yalcin et al. (2017). And if other countries were to engage in retaliatory tariffs as well, the welfare damage to the EU would go up even further. For example, a recent study reports losses to the EU amounting to almost EUR 250 billion per year in 2016 prices (Bertelsmann Stiftung, 2019). In a comprehensive analysis, these risks would have to be compared to the costs arising from carbon leakage or of a less ambitious climate policy. In any case, the EU is well-advised to minimise the risk of such a trade conflict. One way to ease tensions would be to channel public revenue obtained from a CBA system into a global climate fund or to even rebate it to the exporting countries.

6 Conclusions

The fundamental problem of climate policy lies in the fact that not all countries in the world have adopted sufficiently ambitious policies to mitigate emissions. This may be due to free-riding or to the principle of common but differentiated responsibility. As long as coverage remains incomplete, there is the risk of direct and indirect leakage. The former occurs through international trade in goods and services, the latter through global energy markets.

The EU is the world's largest net importer of CO2 as embodied in traded goods and services. While it is empirically unclear whether, historically, the ETS has driven up those net imports, it is very likely that higher future carbon prices in the EU can drive up carbon imports while reducing territorial carbon emissions. Economic modelling shows that border carbon adjustments (CBAs) can indeed reduce such leakage. However, CBAs may have negative effects on trade partners' terms-of-trade, which may induce retaliation. In their complete form, they may be very bureaucratic to implement.

One promising approach that reduces the risk of retaliation and of red tape but which is less effective would be to maintain the EU's system of output based allocation of free emission permits for sectors prone to leakage but to combine it with a new tax on the consumption of goods produced by firms in those sectors, regardless of whether they originate from the EU or abroad.

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BRIEFING

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Trade Related Aspects of a Carbon Border Adjustment Mechanism. A Legal Assessment

Policy Department for External Relations
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EN

DIRECTORATE-GENERAL FOR EXTERNAL POLICIES
POLICY DEPARTMENT

European Parliament

BRIEFING

Trade Related Aspects of a Carbon Border Adjustment Mechanism. A Legal Assessment

ABSTRACT

This briefing provides a legal assessment – under WTO and EU law - of three policy options for an EU carbon border adjustment mechanism. These options are, first, a carbon tax adjusted at the border; second, the inclusion of importers under the EU emission trading scheme; and, third, import tariffs on products from third countries that do not pursue climate policies in line with the Paris Agreement. In the first part of the briefing, these three policies are evaluated against the benchmark of vulnerability to WTO legal challenge. The second part of the briefing assesses the EU decision-making procedures that are applicable to the three policies and the varying degrees of efficiency and democratic participation they imply.

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Authors: Prof. Joost Pauwelyn, The Graduate Institute of International and Development Studies (IHEID) and Georgetown University Law School and Dr. David Kleimann, Johns Hopkins School of Advanced International Studies

Official Responsible: Mario DAMEN

Editorial Assistant: Jan MUYLDERMANS

Feedback is welcome. Please write to: mario.damen@europarl.europa.eu or wolfgang.igler@europarl.europa.eu.

To obtain copies, please send a request to: poldep-expo@europarl.europa.eu

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1. Feasibility under WTO Agreements

1.1 Background on the nature and constraining power of WTO Agreements

The EU is bound by WTO rules under international law

- Both the EU and its Member States are parties to the WTO. They are hence bound, under international law, to comply with WTO agreements.
- WTO rules may constrain EU climate action. They also protect EU trade interests abroad on a reciprocal basis.
- WTO agreements do *not* have direct effect before EU courts ([1]). WTO rules can only be enforced by other WTO members under state-to-state dispute settlement, conducted in Geneva.
- Only other countries (not private industries) may thus challenge any eventual EU carbon border adjustment mechanism for alleged violation of WTO rules.

Giving meaning to (old) WTO provisions

- Relevant WTO rules date mostly from the 1940s when the original GATT was concluded. Potentially applicable subsidy rules have been updated at the creation of the WTO in 1994. None of these rules explicitly address climate change.
- Whether EU action complies with WTO provisions depends predominantly on the *actual text* of those provisions. What is, for example, a 'tax' or 'subsidy' for EU law purposes or from an economic perspective, is not necessarily a 'tax' or 'subsidy' under the text of WTO rules.
- Past WTO rulings have also been referred to in order to guide the meaning of WTO provisions. However, for many questions addressed below, there are no 'precedents' and WTO provisions are vague. This makes it very difficult to predict whether a particular carbon adjustment mechanism would be WTO consistent.

Limited remedies

- Even if the WTO dispute settlement body were to find a WTO violation, any remedy provided is purely prospective and excludes monetary compensation.
- This means that, at worst, the EU could be compelled to change its mechanism with effect only *after* an adverse WTO ruling and a reasonable period of time to implement (which normally takes several years). In this sense, the WTO allows for a degree of 'trial and error'.
- The EU can also decide to keep any violation in place and instead conclude mutually agreed solutions with other countries, or accept to suffer equivalent trade retaliation (as it did, for example, in the *Hormone beef* dispute with the US and Canada).

Relevance of WTO crisis

- The current crisis at the WTO has left the second-stage Appellate Body inoperable (the US is blocking the appointment of new Appellate Body members). First-level panels remain, however, available, but adoption of their reports may now be blocked simply by filing an appeal (to a body that no longer exists and can hence not complete the appeal).
- On the one hand, the potential to block adverse WTO rulings (by appealing 'into the void') could be seen as a weakening of the constraining power of the WTO. On the other hand, the threat of a dysfunctional WTO dispute settlement system means that countries who consider that EU carbon

[1] Case C-149/9, *Council v Portugal* [ECLI:EU:C:1999:574], paras 44-49.

border adjustment violates WTO rules may 'take the law in their own hands' (and retaliate against the EU) without going through the required WTO proceedings.

1.2 Overview of relevant WTO disciplines

Whether carbon border adjustment complies with WTO rules has been a subject of debate for many years. Most commentators today agree that at least certain types of adjustment could pass muster at the WTO, and that much will depend on the details of any such mechanism[2]. Although widely discussed and anticipated, few actual examples of carbon border adjustment can be found. None have been challenged before the WTO to date.

1.2.1 Relevant WTO rules that could be invoked against carbon adjustment on imports

- **Tariff bindings**: For each product imported into the EU, the EU 'bound' itself to a maximum rate of import duties or tariffs (under GATT Article II). A carbon adjustment on, for example, imported steel, if construed as an import tariff, could be found to exceed the EU's tariff binding on steel. GATT Article II:2(a) explicitly allows, however, for 'border tax adjustment', that is, an import 'charge equivalent to an internal tax … in respect of the like domestic product [here, EU steel] or … an article [e.g. steel inputs] from which the imported product has been manufactured or produced in whole or in part'. This could excuse certain carbon levies on imports 'equivalent' to a domestic carbon 'tax', as discussed below (under 1.3.1).
- **National treatment**: The EU promised not to discriminate (either *de jure* or *de facto*) imported products as compared to like EU products (under GATT Article III). To the extent the carbon adjustment on, for example, cement imported from China were to be construed not as a tariff (on imports only) but as part of, or equivalent to, an indirect tax or regulation on both domestic and imported cement, the EU must ensure a 'level playing field' (see below under 1.3.2 and 1.3.3).
- **Prohibition on quantitative import restrictions (QRs)**: If the EU carbon adjustment were not seen as an import tariff or duty, nor as an internal tax or regulation, but rather as a border restriction that limits imports, GATT Article XI could be violated.
- **Most-favored-nation treatment (MFN)**: Whatever the classification of the carbon adjustment, it cannot discriminate between like products imported from different countries, e.g. between aluminum from Canada versus like aluminum from the US. If it does, GATT Article I (or XIII, for quantitative restrictions) would be violated (see below under 1.3.4).

Crucially, even if any of the above four WTO rules (tariff bindings, national treatment, prohibition on QRs, MFN) were found to be violated, **GATT Article XX health and environmental exceptions** (see below under 1.3.5) can justify such violation on condition that the import adjustment is:

- a measure 'necessary to protect human, animal or plant life or health' (GATT Article XX(b)) or 'relating to the conservation of exhaustible natural resources' (and 'made effective in conjunction with restrictions on domestic production or consumption') (GATT Article XX(g)), *and*

[2] See, for instance: Dias, Anna, Stéphanie Seeuws, Agnieszka Nosowicz (2020): *EU Border Carbon Adjustment and the WTO: Hand in Hand Towards Tackling Climate Change*, 15 Global Trade and Customs Journal, Issue 1, pp. 15–23. Porterfield, Matthew (2019): *Border Adjustments for Carbon Taxes, PPMs, and the WTO,* U. Pa. J. Int'l L. Vol. 41:1. Will, Ulrike (2019): *Climate Border Adjustments and WTO Law: Extending the EU Emissions Trade System to Imported Goods and Services*, Brill. Trachtman, Joel P. (2016): *WTO Law Constraints on Border Tax Adjustment and Tax Credit Mechanisms to Reduce the Competitive Effects of Carbon Taxes*, Resources for the Future Discussion Paper 16-03. Marceau, Gabrielle (2016): *The Interface between the Trade Rules and Climate Change Actions*, in: Park, Deok-Young (Ed.): Legal Issues on Climate Change and International Trade Law, Springer, 3-39. Pauwelyn, Joost (2013): *Carbon Leakage Measures and Border Tax Adjustments under WTO Law*, in: Van Calster, Geert & Denise Prévost (eds.), Research Handbook on Environment, Health and the WTO, 448.

- 'not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail' or 'a disguised restriction on international trade' (the so-called *chapeau* of GATT Article XX).

1.2.2 Relevant WTO rules that could be invoked against carbon adjustment on exports

Carbon border adjustment could include not only a duty or imposition on imports, but also a **rebate of carbon cost when certain EU products are *exported***. Rebating energy-intensive exports may address competitiveness concerns of EU producers on the world market. Yet, such rebates may also delay climate efforts within the EU as EU producers could then avoid paying the cost of carbon simply by exporting carbon-intensive products. For this reason, most initiatives and commentators propose to adjust carbon measures only on imports, not on exports.

If an EU adjustment mechanism were, nonetheless, to include an exemption or rebate for exports, other WTO members could challenge this as an **export subsidy**, as such exemption or rebate could be seen as a 'financial contribution' by the EU in the form of 'government revenue that is otherwise due' (e.g. a carbon tax or cost of carbon allowance) which is 'foregone or not collected' contingent on exporting the product. Export subsidies are prohibited under the WTO's Agreement on Subsidies and Countervailing Measures (ASCM) (Article 3.1(a)).

Crucially, however, the ASCM Agreement (footnote 1) **explicitly allows for the 'exemption of an exported product from duties or taxes borne by the like product when destined for domestic consumption'**, for as long as it merely 'levels the playing field', i.e. the rebate is 'not in excess' of the carbon cost that would have been imposed if the exported product were consumed within the EU.

Note that border adjustment, be it on imports or exports, is a *right*, or *permitted* under WTO rules. There is *no obligation* to do it. Thus, by currently not adjusting the EU ETS, the EU is not violating any WTO rule. Moreover, if the EU decides in the future to adjust only on imports and stays within the limits described above, it is not obliged to adjust also on exports.

1.3 Key cross-cutting questions for carbon adjustment on imports to be WTO consistent

Generally speaking, two distinct motives inspire calls for carbon adjustment on imports:

(i) **competitiveness** or 'level the playing field' concerns (EU producers pay a carbon cost, which imports do not), and

(ii) **environmental** concerns (fighting carbon leakage and/or inducing other countries or foreign producers to cut emissions).

The WTO disciplines outlined above under 1.2 provide legal shelter for both, subject to certain limitations. Competitiveness concerns are addressed in GATT Article II (tariff bindings) and GATT Article III (national treatment). Environmental concerns are allowed for in GATT Article XX (health and environmental exceptions).

Whether an EU carbon measure can be adjusted on imports depends on whether the measure meets the criteria set out in the WTO provisions that allow for border adjustment, notably GATT Articles II and III. In other words: does the EU measure fall within the scope of these provisions in the first place? Sections 1.3.1 and 1.3.2 below set out the scope of EU measures that are adjustable in line with WTO law.

If the EU measure is, according to the relevant GATT provisions, border adjustable, it must pass a second test: does the measure violate the National Treatment provisions of GATT Article III or the MFN principle

enshrined in GATT Article I. Section 1.3.3 (national treatment) and section 1.3.4 (MFN) below discuss this very question.

Finally, even if the EU measure at issue does violate one of the above-mentioned WTO border adjustment or non-discrimination rules, it may still be justifiable under the General Exceptions of GATT Article XX, which protects – under certain conditions – health and environmental measures from WTO inconsistency. This is discussed under 1.3.5 below.

1.3.1 Is the EU carbon measure imposed on EU production an 'indirect tax' or 'affecting' an EU product's internal use or sale?

Competitiveness concerns are catered for under the theory of 'border tax adjustment' and 'national treatment': if a domestic tax or regulation is sufficiently product or sales related (think of VAT, an excise tax on cigarettes or a dolphin-safe labeling requirement for the sale of tuna), it can be imposed or adjusted also on imports and this to ensure equal conditions of competition. Yet, other taxes or regulations, targeting not so much products or their inputs, but rather producers, employees or profits (think of corporate or payroll taxes or environmental land use restrictions), cannot be adjusted on imported products.

The key question is, therefore, whether a carbon tax or regulation, *as it is imposed domestically within the EU*, is more like an adjustable VAT (targeting products, inputs or consumption) or a non-adjustable payroll tax (targeting predominantly producers

In WTO legal terms, the EU ETS, for example, can be adjusted on imports based exclusively on competitiveness concerns, if, but only if, it can be construed either as

(a) an 'internal tax or other internal charge of any kind … **applied, directly or indirectly**, to … [EU] **products** [e.g. energy used or cement produced in the EU]' [3], or

(b) a law, regulation or requirement '**affecting** … [an EU **product's**, e.g. EU energy or cement] **internal sale**, offering for sale, purchase, transportation, distribution or use' [4].

What matters is the nexus between the ETS and *inputs or products* used or produced in the EU (e.g. does the ETS apply at least indirectly to EU cement as a product?), that is, the measure's *target*; not the *reason* for the measure, e.g. whether it relates to something physically in the product (say, a sugar versus a carbon tax) or to something that happened in or outside the EU (say, carbon emissions in the EU or China).

Further guidance on precisely what types of taxes are adjustable at the border can be found in the ASCM Agreement, which addresses the flip side of adjustment on imports, namely rebates on exports. There, it is confirmed that only 'indirect taxes' [5] -- and not 'direct taxes' [6] -- are border adjustable. However, adjustable 'indirect taxes' are broadly defined as 'all taxes other than direct taxes'. Direct taxes, in turn, are limited to income and property taxes. **Since a carbon tax is neither an income nor property tax it would most likely be qualified as an adjustable 'indirect tax'**. In addition, adjustable 'indirect taxes' explicitly include not only consumption taxes or taxes on final products (such as VAT) but also inter-mediate taxes **'in**

[3] GATT Article III:2.

[4] GATT Article III:4.

[5] SCM footnote 58 defines 'indirect taxes' as 'sales, excise, turnover, value added, franchise, stamp, transfer, inventory and equipment taxes, border taxes and all taxes other than direct taxes and import charges'; border adjustment permitted in line with SCM Annex I(g) and (h).

[6] SCM footnote 58 defines 'direct taxes' as «taxes on wages, profits, interests, rents, royalties, and all other forms of income, and taxes on the ownership of real property'; border adjustment prohibited pursuant to SCM Annex I(e).

respect of the production and distribution' of products' [7]. In other words, process or production taxes including taxes on inputs[8] such as fuels (and fuel-related carbon emissions) could be 'indirect taxes' adjustable at the border[9].

1.3.2 Is the EU carbon measure imposed on EU production a 'tax or other charge' or a 'regulation'?

As noted earlier, pursuant to GATT Article III, not only indirect 'taxes or other charges' but also internal regulations (sufficiently related to the sale, purchase or use of a product or input) can be adjusted on imports[10]. In this sense, no major difference is made between taxes and regulations. Both can be border adjustable.

That said, border adjustment of taxes or other price measures is somewhat more flexible. An internal EU carbon tax can be adjusted simply by applying it at the point of sale or consumption in the EU of, say, cement, irrespective of whether the cement was made in the EU or imported from China (pursuant to GATT Article III:2). An internal carbon tax or charge can also be adjusted at the border with a border tariff or charge 'equivalent to' the internal carbon tax (pursuant to GATT Article II:2(a)).

An internal regulation, in contrast, can only be adjusted for imports by applying the same or an equivalent regulation also on imports. Think, potentially, of an emissions allowance requirement imposed for both EU production and imports[11]. Border adjustment of an internal regulation by means of a border tax is not provided for in GATT Article II. Article II only permits border charges 'equivalent to an internal tax', not border charges equivalent to an internal regulation.

1.3.3 Is the carbon measure on imports discriminatory compared to that on 'like' domestic products?

Assuming that the EU carbon measure on EU production can be adjusted also on imported products (pursuant to GATT Article II or III), such adjustment cannot impose a heavier burden on imports as compared to 'like' domestic products. Let's take the example of steel:

- The carbon cost imposed on 'like' steel imported from, for example, China cannot be in excess of that imposed on EU steel production. Past WTO rulings have found products to be 'like' based on their competitive economic relationship in the market place. This means that, most likely, EU and Chinese steel *irrespective of their carbon footprint* would be found to be 'like'. If, on the whole, China exports 'dirtier' steel to the EU compared to 'cleaner' EU steel, then a finding of *de facto* discrimination is possible, on the ground that the group of imported steel from China is hit harder

[7] SCM Annex I(g).

[8] GATT Article II:2(a) on border tax adjustment explicitly allows for border adjustment of internal taxes not only 'in respect of … domestic products[s]' but also in respect of 'an article [or input] from which the imported product has been manufactured or produced in whole or in part'. As a result, not only taxes on the final product (such as excise taxes on cigarettes) but also taxes on inputs (such as a tax on alcohol used in the production of perfume) can be adjusted on imports (of e.g. cigarettes or perfume made with alcohol).

[9] SCM Annex I(h) which addresses a specific sub-group of indirect taxes (namely, 'prior-stage cumulative indirect taxes') explicitly includes as adjustable 'taxes … levied on inputs that are consumed in the production of the … product' which are later (in Annex II, footnote 61) defined as including not only 'inputs physically incorporated' in the final product, but also taxes on inputs such as 'energy, fuels and oil used in the production process'.

[10] See Ad Note to GATT Article III: 'Any … law, regulation or requirement … which applies to an imported product and to the like domestic product and is collected or enforced in the case of the imported product at the time or point of importation, is nevertheless to be regarded as … a law, regulation or requirement … subject to the provisions of Article III [national treatment]'.

[11] Whether the requirement to hold emission allowances can be seen as a 'tax or other charge', or is rather a 'regulation', for purposes of GATT Article III, remains an open question. For purposes of the EU-US Open Skies Agreement, the ECJ rejected the notion that the obligation to buy emission allowances is a tax or charge and construed it rather as a special type of regulation (*Air Transport Association of America et al. v. Secretary of State for Energy and Climate Change*, Case C-366/10, 21 December 2011, paras. 142-143), discussed below under 2.2.2.

than the group of EU steel. However, any such *de facto* discrimination (in violation of GATT Article III) could still be justified under environmental exceptions discussed under 1.3.5 below.

- One way to avoid such *de facto* discrimination is to impose on imports of steel from China the *average* carbon price levied on EU steel. By using the EU group average, *de facto* group equality can be ensured. In addition, individual Chinese exporters could be allowed to demonstrate that they emitted *less* than the EU average, and on that basis pay a lower carbon price. If so, the overall group of Chinese imports only stands to be treated *more favorably* than the group average of EU steel producers.
- Another way to avoid *de facto* discrimination is to focus on, i.e. tax or regulate, inputs rather than the final product. If the EU taxes energy used in the production of steel, the adjustment on imported steel could be equally calculated with reference to the energy used abroad (say, the coal used in the production of Chinese steel). Doing so, the EU could then be said to tax imported energy (and emissions) embedded in imported steel at the same level of 'like' energy (and emissions) used in the production of EU steel. The 'like products' (and related tax burdens) to be compared are then energy as inputs (say, coal, treated equally, be it EU or Chinese coal), not the end product steel (which may *de facto* be discriminated, depending on how 'clean' or 'dirty' overall EU v. Chinese steel production is).

1.3.4 Does the carbon measure discriminate between like imports from different countries?

i. Adjusting for carbon cost already paid in the country of production

Traditional 'border tax adjustment' operates on the basis of the destination principle: domestic consumption, including imports, is taxed; exports are rebated. This means that, technically, EU carbon border adjustment could levy the *full* carbon price on imports *irrespective of the country of origin*, on the assumption that the county of origin has rebated whatever carbon price charged there. Put differently, the EU could fully adjust imports of, for example, Canadian steel, as normally whatever carbon price Canada imposes can be rebated by Canada upon export of the steel. In the end, only the carbon price at (EU) destination would then be levied.

In practice, however, and for reasons mentioned in section 1.2.2, carbon adjustment *for exports* is not likely. As a result, the EU may want to adjust the carbon price on imports with reference to the price already paid in the country of production. If so, the EU should ensure not to discriminate between 'like' products from different countries (GATT Article I MFN, see section 1.2.1).

ii. Exemptions for imports from specific countries

Instead of a varying carbon adjustment depending on the actual or average carbon cost already paid in the country of origin, the EU could also exempt imports on a country-specific basis. For example, the adjustment could be waived for imports from least developed countries or from countries that are party to the Paris Agreement or have climate legislation equivalent to the EU. As such differentiation would be origin-based, it would most likely constitute a violation of GATT Article I MFN. However, like any violation discussed so far, it could be justified on environmental grounds, discussed next.

1.3.5 Can the EU border adjustment on imports be justified on environmental grounds?

Any GATT violation -- be it a tariff violation under GATT Article II or national treatment or MFN discrimination under GATT Articles I or III – can still be saved under GATT Article XX. At this juncture, what counts is no longer competitiveness concerns of 'leveling the playing field', but **whether the adjustment is grounded on environmental concerns** such as carbon leakage:

- There can be little doubt that, generally speaking, EU measures combatting climate change, including adjustments at the border, relate to a health or environmental concern with a sufficient nexus to EU territory (referred to in GATT Article XX(b) and (g)): Because GHGs mix in the atmosphere, all emissions, whether they occur in the EU, China or the US, pose the same local risk to EU citizens. This distinguishes climate measures from measures aimed at tackling purely extraterritorial concerns (such as ground water protection in China, or minimum wages in Bangladesh).
- There must also be a close enough nexus between the adjustment on imports and the climate change (e.g. carbon leakage) concerns it aims to address. In this respect, the key question is whether a less trade restrictive measure could achieve the same level of climate protection. Free allowances are one option, but as they involve not imposing a carbon cost at all on certain production, this option probably does not achieve the same level of climate protection. In addition, border adjustment never bans imports; it only charges a certain price for embedded carbon. As such, border adjustment, while it restricts trade, remains a relatively open policy.

Even if the carbon adjustment on imports, because of its positive, global climate change impact, is 'necessary' or sufficiently 'related to' health or the 'conservation of exhaustible natural resources' in the EU (under paragraph (b) or (g) of GATT Article XX), it must also be **applied in a way that does not amount to 'arbitrary or unjustifiable discrimination between countries where the same conditions prevail'** (under the chapeau of Article XX):

- Even if calibrating the border adjustment to the carbon cost already paid in the country of origin may involve a form of discrimination, it is arguably justified and not arbitrary since based on environmental grounds (i.e. internalising the social cost of carbon, wherever it is paid).
- Similarly, exempting least developed countries (LDCs) is probably discriminatory, but could be justified on environmental grounds: LDCs have historically emitted far less than developed countries and such differentiation is enshrined also in the Paris Agreement.
- In both examples, the countries treated differently could also be said to be countries where *different* 'conditions prevail', so there is arguably no discrimination in the first place.
- What prior WTO rulings have, however, condemned is measures that have an 'intended and actual coercive effect on the specific policy decisions made by foreign governments'[12]. Taxing the average or actual carbon content of imports from, say, China, does not require any policy change in China. It merely implies that that part of China's production which is sold in the EU will need to pay the EU's carbon price. In contrast, imposing a 'punitive' carbon tariff on imports from countries that are not party to the Paris Agreement or do not have the same carbon price policy in place as the EU, is conditioned on the overall policy in the country of origin. This could be seen as coercive, and would be more difficult to justify.

[12] Appellate Body Report, *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/AB/R, adopted 6 November 1998, para. 161.

1.4 Instrument-by-instrument conclusion

1.4.1 Carbon tax adjusted at the border

An EU (or member state) indirect tax on the use or consumption of energy or energy-intensive products (and their related GHG emissions) is the option that can most easily be adjusted also on imports (in line with GATT Articles II:2(a) and III, and the corresponding provision on export rebates in SCM footnote 1 and Annex I(g)). Care must then, however, be taken not to discriminate *de jure* or *de facto* against imports, or between different sources of importation. Importantly, even if some discrimination were found, it can still be justified under GATT Article XX to the extent the differentiation made is sufficiently linked to health or environmental concerns (rather than trade protectionism or competitiveness concerns).

1.4.2 Including imports into a 'cap and trade' system

On the assumption that a 'cap and trade' system is closer to an internal regulation than an internal (indirect) tax, also internal regulations can be adjusted for imports, but only with an equivalent regulation (not an import tariff or tax). The regulation must, however, be affecting the sale or use of products (GATT Article III:4). Here as well, no discrimination can be made against or between imports. If some discrimination were found, it could still be justified under GATT Article XX to the extent it sufficiently relates to health or environmental concerns (rather than trade protectionism or competitiveness concerns).

1.4.3 Import duties for countries outside the Paris Agreement or not charging for GHG emissions

This option is likely discriminatory in violation of GATT Article I MFN. In addition, since it is conditioned on the overall policy in place in the country of production (rather than the embedded carbon in the imported product or average carbon footprint of the specific foreign producer), it could be seen as coercive, and not in line with the *chapeau* of the health and environmental exception in GATT Article XX. This option is most vulnerable to WTO challenge.

2. Feasibility under EU Law

In recent climate change legislation, the European Parliament and the Council outlined a legislative path towards adopting EU measures that have the potential to prevent carbon leakage. The legislators contemplate that a review of the EU ETS 'could consider whether it is appropriate to replace, adapt or complement any existing measures with carbon border adjustments or alternative measures' so as to render 'importers' of products produced in sectors covered by the ETS subject thereto[13]. Albeit in aspirational language, the European Parliament and the Council hereby delineate a broad realm of possibilities for future carbon leakage legislation.

This section assesses the legal feasibility under EU law of three distinct policy options falling within this realm. For each option, the assessment responds to the following questions: Is the Union competent to act? If so, is the Union competence exclusive or shared with the Member States? What is the legal basis for Union action? Which legislative procedure applies? Is the European Parliament involved as a co-legislator or not? Does the Council decide by qualified majority voting or unanimity?

The three policy options under evaluation are:

i. EU legislation harmonising the imposition of a carbon tax or, alternatively, the imposition of a carbon tax by one or several Member States.

[13] Directive (EU) 2018/410 of the European Parliament and the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814, recital 24

ii. The inclusion of importers of like domestic products in the EU ETS.
iii. The imposition of 'punitive tariffs' on imports from countries that do not pursue policies in line with the Paris Agreement.

2.1 EU and Member State carbon tax legislation

2.1.1 An EU carbon tax

i. EU competence and legal basis

The EU shares competence for 'environment' with the Member States, as listed in Article 4(e) TFEU. Moreover, Article 191(1) under TFEU Title XX on 'Environment' provides that 'Union policy on the environment shall contribute to pursuit of the following objectives: - preserving, protecting, and improving the quality of the environment, - protecting human health, - the prudent and rational utilization of natural resources, - promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change.'

Does an EU carbon tax fall within the scope of Article 191(1) TFEU? It does. It is established CJEU jurisprudence that the choice of the legal basis for a Union act must rest on factors that, in particular, include the aim and the content of the measure at issue[14]. The application of those criteria amounts to the question whether the imposition by the Union of a tax on certain products – whether imported or not – on the basis of carbon emitted in the course of the consumption or production of these products is aimed at achieving the objectives listed under Article 191(1) TFEU. Notwithstanding the precise design, structure, and operation of an EU act harmonising legislation for a carbon tax, the answer to this question is highly likely to be affirmative for one, several, or all objectives listed in Article 191(1) TFEU. **It follows that the Union is competent to adopt a respective Union policy.**

ii. Legislative procedure: *special* or *ordinary*?

Article 192(1) TFEU provides that Union acts laying down policies contributing to the objectives listed in Article 191(1) TFEU are generally adopted in accordance with the **ordinary legislative procedure (OLP)**[15]. The OLP is codified in Article 289(1) TFEU and Article 294 TFEU. Here, in essence, the European Parliament and the Council co-decide on a legislative proposal tabled by the Commission. In the OLP, the Council acts, by and large, by qualified majority voting[16].

However, EU legal acts on the environment must be adopted in accordance with a **special legislative procedure** if the provisions of that act are **'primarily of a fiscal nature'**[17]. If so, the Council acts unanimously on a proposal from the Commission after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions[18].

The jurisprudence of the CJEU suggests that a scheme, which generates revenue for public authorities and creates a *direct and inseverable link* between a charge on carbon emitted and the production or consumption of a product, makes for a tax[19]. As a tax scheme is an instrument of fiscal policy, it is arguably

[14] See, for instance, Opinion 2/00, ECLI:EU:C:2001:664, para 25; C-268/94, *Portugal v Council*, [1996] ECR I-6177, para 22; Case C-269/97, *Commission v Council* [2000] ECR I-2257, para 43; C-36/98, *Spain v Council*, [2001] ECR I-779, para 58.
[15] Article 192(1) TFEU
[16] Article 16(3) TEU
[17] Article 192 (2)(a) TFEU
[18] Ibid.
[19] See the Court's reasoning in C-346/97 – *Braathens* [ECLI:EU:C:1999:291] where the Court, in para 23, observes the existence of a *direct and inseverable link* between fuel consumption and polluting substances taxed by the Swedish carbon scheme at issue, leading the Court to the conclusion that the charge on the pollutants must be "regarded as levied on consumption of the fuel

'primarily of a fiscal nature' within the meaning of Article 192(2) TFEU and hence subject to the special legislative procedure laid out in that provision. Taxation, in fact, remains one of the last bastions of policy areas subject to a unanimity requirement in the Council. The Commission, in the recent communication titled *Towards a more efficient and democratic decision-making in EU tax policy,* laments this circumstance and advocates a shift towards qualified majority voting in the Council and the involvement of the European Parliament as a co-legislator[20].

iii. Switching from *special* to *ordinary* legislative procedure for the purpose of EU carbon tax legislation?

The EU Treaties allow for a change of legislative procedure. Article 192(2) TFEU provides for the possibility to switch, for the purposes of tax measures in the area of environment policy, to the OLP and hence qualified majority voting in the Council. The so-called 'passarelle clause' in Article 192(2), second sentence, stipulates that the Council, acting unanimously on a proposal from the Commission and after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions, may render the OLP applicable.

This switch from the special legislative procedure to the OLP – as advocated by the Commission as more efficient and democratic decision-making in EU tax policy – would add the European Parliament as a co-legislator in carbon tax legislation.

2.1.2 A Member State carbon tax

Notwithstanding the current absence of EU carbon tax legislation, Finland, Ireland, and Sweden have already adopted varying carbon tax schemes[21]. It is hence important whether and under which conditions EU Member States may maintain or adopt carbon tax legislation if the EU enacts a Union wide carbon tax. The following considerations shed light on the 'preemptive effect' of a prospective EU carbon tax on Member State carbon tax legislation, irrespective of the question whether such legislation applies to products imported from third countries.

As noted above, carbon tax legislation falls within the area of environmental policy, which is a shared competence as provided by Article 4(e) TFEU read in conjunction with Article 191(1) TFEU. Where the treaty confers on the EU a competence shared with the Member States, the Member States may, as a general rule, only exercise their competence to the extent that the Union has not exercised its competence (Article 2(2) TFEU). In other words, as a general rule, Member State legislation in a specific area of shared competence is 'preempted' by the exercise of Union competence in that area.

However, EU primary law, EU secondary legislation, and CJEU jurisprudence qualify the preemption of Member States' lawmaking powers by Union legislation in various ways[22]. With respect to environmental policy, the TFEU codifies a minimum harmonisation clause: Article 193 TFEU limits the preemptive effect of Union legislation to the extent that protective measures adopted pursuant to Article 192 TFEU 'shall not prevent any Member State from maintaining or introducing more stringent protective measures', provided that such measures are 'compatible with the Treaties'. In other words, Union legislation in the area of environmental policy only sets a floor that may be complemented by stricter (but not less strict) Member

itself" and hence makes for a fuel consumption tax. By contrast, the Court, in C-366/101/EC – *Open Skies* [ECLI:EU:C:2011:864] found that the inclusion of aviation in the EU ETS by means of Directive 2008/101 amending Directive 2003/87/EC did not create a *direct and inseverable link* between a payable amount and the fuel consumed for flights carried out by the operators and could therefore not be considered a tax, fee or charge on fuel consumption. paras. 142-147

[20] European Commission (2019): Communication from the European Commission to the European Parliament, the European Council, and the Council – Towards a more efficient and democratic decision-making in EU tax policy, Strasbourg, 15.1.2019.

[21] see https://www.carbontax.org/where-carbon-is-taxed/

[22] Arena, Amadeo (2016): Exercise of EU Competences and Pre-emption of Member States' Powers in the Internal and the External Sphere: Towards 'Grand Unification'?, Yearbook of European Law, Volume 35, Issue 1, December 2016, Pages 28–105

State legislation in the same field. In any event, a Member State's carbon tax legislation must not be incompatible with Article 110 TFEU, which prohibits *inter alia* the imposition of taxation on other Member States' similar products in excess of internal taxation of any kind.

2.1.3 Conclusion

It follows that the Union could adopt a carbon tax (including on imports or not) under EU primary law governing environmental policy, either via a special legislative procedure requiring unanimity in the Council, or via the OLP if the Council adopts a Commission proposal to this end by unanimity *ex ante*. Member States may maintain or introduce carbon taxes even in case of EU exercise of lawmaking powers in the area of environmental protection if, and only if, such measures set stricter requirements than respective EU legislation. The above considerations are equally valid for Member State legislation governing trade in carbon emission allowances, which is regulated by the EU ETS[23].

2.2 The inclusion of importers in the EU ETS

One way to establish an emission trading scheme for imports is to amend EU Directive 2003/87/EC – i.e. the EU ETS – to the effect that importers of products from specified sectors are required to surrender an EU wide average amount of allowances necessary for the production of the like domestic product within the EU[24]. Such proposals have been floated by Member States in the past[25].

2.2.1 EU competence and legal basis

Consistent with the determination of Union competence and of the appropriate legal basis detailed above in 2.1.2, the Union is, under Article 191(1) TFEU, competent to adopt a Directive amending the EU ETS to the effect outlined above.

2.2.2 Legislative procedure

The European Parliament and the Council can adopt a respective Directive in accordance with the OLP, which is subject to qualified majority voting in the Council[26].

This Union act, in contrast to carbon tax legislation, does not appear to require adoption under the special legislative procedure designated for acts containing 'provisions of primarily fiscal nature'[27]: In its decision on *Air Transport Association of America and other American Airlines*[28], the CJEU found that the EU ETS, 'by reason of its particular features, constitutes a market-based measure and not a duty, tax, fee, or charge'[29]. In the same vein, the Court held that the ETS was not intended to generate revenue for the public authorities and does not create a *direct and inseverable link* between consumption quantity (of fuel, in this case) and the pecuniary burden of the consumer at issue (the aircraft operators)[30].

The EU ETS, and an amendment to the effect of including importers into the ETS, hence arguably does not amount to 'provisions of primarily fiscal nature' within the meaning of Article 192(2) TFEU. On this reading, the special legislative procedure would not be triggered.

[23] The UK, for instance, has maintained a price floor for carbon that requires emitters to pay an additional charge per ton when the EU price for allowances falls below that floor. See https://www.carbontax.org/where-carbon-is-taxed/
[24] Directive 2003/87/EC of the European Parliament and the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC
[25] See, for instance: https://www.euractiv.com/section/trade-society/news/france-details-plans-for-carbon-inclusion-mechanism/
[26] Article 192(1) TFEU
[27] Article 192(2)(a) TFEU
[28] C-366/10/EC – Air Transport Association of America and others [ECLI:EU:C:2011:864]
[29] Ibid.: para 147
[30] Ibid.: paras 142-146

2.2.3 Conclusion

The EU institutions could adopt an amendment of the EU ETS via the OLP to include importers of 'like' products in the EU ETS. For the purposes of the OLP, the Council decides on the adoption of such a measure by qualified majority vote.

2.3 Import duties for countries outside the Paris Agreement

The Union could envisage suspending tariff concessions vis-à-vis third countries that have not made carbon emission reduction commitments under the Paris Agreement or are failing to implement their reduction commitments. The purpose of such a measure would be to counteract anti-competitive effects of high-carbon imports on domestic production, and to incentivise the adoption of more stringent climate policies that meet the standard of the Paris Agreement. The Union would, in other words, employ a trade policy instrument to achieve both environmental and economic objectives. This duality of objectives can be important for the determination of EU competence and the appropriate legal basis. A dual legal basis for such a Union act may, for instance, have implications for the legislative division of labor within the Union institutions.

2.3.1 EU competence and legal basis

The Union may be competent to adopt such tariff measures in exercise of its exclusive competence for Common Commercial Policy conferred by Article 3(e) TFEU, read in conjunction with Article 207(1) TFEU. This is the case when a measure relates specifically to international trade in that it is essentially intended to promote, facilitate or govern trade and has direct and immediate effects on trade[31].

It is established CJEU jurisprudence, however, that a Union act cannot be based on only one legal basis if it 'includes, both as regards the aims pursued and its contents, two indissociably linked components, neither of which can be regarded as secondary or indirect as compared with the other' [32]. In Opinion 2/15, moreover, the Court held that 'the exclusive competence of the European Union referred to in Article 3(1)(e) TFEU cannot be exercised in order to regulate the levels of social and environmental protection in the [Singapore FTA] Parties' respective territory' [33]. It is arguable by inference that Article 207 TFEU alone does not suffice as a legal basis for the enactment of tariffs, that unilaterally penalise third countries for their non-ratification of the Paris Agreement. Article 207 TFEU would arguably suffice as the sole legal basis, on the other hand, for the use of a trade instrument to enforce mutual commitments made under the Paris Agreement as the Court considers the objective of 'sustainable development', including of the environment, to make for an "integral part of Common Commercial Policy". [34]

It is for these reasons that a Union act, which seeks to achieve both commercial and environmental objectives to a similar extent while conditioning the use of an external economic policy instrument on a third countries' ratification of the Paris Agreement, **requires reference to both Article 207 TFEU on common commercial policy and Article 191 TFEU on environment.** As noted above, the Union shares competence for the latter with the Member States.

[31] Case C-414/11, *Daiichi Sankyo*. ECLI:EU:C:2013:520, para 51; C-411/06, *Commission vs Parliament and Council,* ECLI:EU:C:2009:518, para 71; C-347/03, *Regione autonoma Friuli-Venezia Giulia and ERSA*, ECLI:EU:C:2005:285, para 75.
[32] Case C–94/03, *Commission v Council,* ECLI:EU:C:2006:2, para 51.
[33] Opinion 2/15, *Singapore FTA*, ECLI:EU:C:2017:376, para 164.
[34] Ibid. paras 141-147.

2.3.2 Legislative procedure and implementing acts

The European Parliament and the Council could, in accordance with Article 207(2) TFEU and via the OLP adopt a regulation amending Article 1 (subject matter), Article 3 (scope), and Article 4 (exercise of the Union's rights) of EU Regulation 654/2014 to the effect outlined above[35].

Under the amended regulation, the Commission can then adopt implementing acts determining the appropriate commercial policy measures, notably 'the suspension of tariff concessions and the imposition of new or increased customs duties' (Article 5 of the Enforcement Regulation). The Commission adopts such implementing acts with assistance of the Member States in accordance with the examination procedure codified in Article 5 of EU Regulation 182/2011 [36].

The adoption of implementing acts by the Commission under the examination procedure is relatively permissive for the Commission if viewed in comparison with other procedures applicable to the adoption of implementing acts. In the examination procedure, an act can eventually be adopted even if the committee assisting the Commission does not reach the voting threshold to deliver a positive or a negative opinion.

2.3.3 Conclusion

The Union could adopt 'punitive tariffs' by amending the existing 'Enforcement Regulation' via the OLP under Article 207(2) TFEU and Article 191(2) TFEU. In the OLP, the Council acts by qualified majority vote.

2.4 Instrument-by-instrument conclusion

2.4.1 An EU or Member State carbon tax

The Union could adopt a carbon tax (including on imports or not) under EU primary law governing environmental policy, either via a special legislative procedure requiring unanimity in the Council, or via the OLP if the Council adopts a Commission proposal to this end by unanimity *ex ante*. Member States may maintain or introduce measures even in case of EU exercise of lawmaking powers in the area of environmental protection if, and only if, such measures set stricter requirements than respective EU legislation.

2.4.2 Including imports in the EU 'cap and trade' system

The EU institutions could adopt an amendment of the EU ETS via the ordinary legislative procedure (OLP) to include importers of 'like' products in the Emission Trading Scheme. For the purposes of the OLP, the Council decides on the adoption of such a measure by qualified majority vote.

2.4.3 Import duties for countries outside the Paris Agreement

The Union could adopt the measure at issue here by amending the existing 'Enforcement Regulation' via the ordinary legislative procedure under Article 207(2) TFEU and Article 191(2) TFEU. In the OLP, the Council acts by qualified majority vote. The adoption of implementing acts by the Commission under the examination procedure, in order to impose duties on respective third countries in line with the amended Enforcement Regulation, is relatively permissive for the Commission in comparison to other procedures applicable to the adoption of implementing acts.

[35] Regulation (EU) No 654/2014 of the European Parliament and the Council of 15 May 2014 concerning the exercise of the Union's rights for the application and enforcement of international trade rules and amending Council Regulation (EC) No 3286/94 laying down Community procedures in the field of the common commercial policy in order to ensure the exercise of the Community's rights under international trade rules, in particular those established under the auspices of the World Trade Organization.

[36] Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers

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BRIEFING

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European Parliament

Political Assessment of Possible Reactions of EU Main Trading Partners to EU Border Carbon Measures

Policy Department for External Relations
Directorate General for External Policies of the Union
PE 603.503 - April 2020

EN

DIRECTORATE-GENERAL FOR EXTERNAL POLICIES
POLICY DEPARTMENT

European Parliament

BRIEFING

Political Assessment of Possible Reactions of EU Main Trading Partners to EU Border Carbon Measures

ABSTRACT

This briefing discusses the possible reactions of the European Union's larger trading partners to carbon border measures. Section 1 discusses experiences of carbon border adjustment-like regimes prior to the European Commission's announcement of the Green Deal. It focuses on the EU Aviation Directive, the US policy debate, and the Californian CBA for electricity. Section 2 considers reactions to the Green Deal announcement, based on informal discussion with officials from major trading partners to the EU. It identifies positive and negative reactions to the principle of an EU CBA, concerns about its design, criticisms and potential policy responses by these partners. Section 3 discusses the implications of our findings. It points to several features in the design and introduction of an EU CBA mechanism that we believe will importantly affect how partners will react to such mechanism.

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Authors: Prof. André Sapir and Prof. Henrik Horn, Bruegel

Official Responsible: Mario DAMEN

Editorial Assistant: Jan MUYLDERMANS

Feedback is welcome. Please write to: mario.damen@europarl.europa.eu or wolfgang.igler@europarl.europa.eu.

To obtain copies, please send a request to: poldep-expo@europarl.europa.eu

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1 Carbon border adjustments prior to the Green Deal announcement

Carbon border adjustment (CBA) schemes are still very rare in practice. It is therefore difficult to make inferences based on history about what the reactions to CBAs within the Green Deal might be. But there are some pieces of evidence that might give some indication of potential responses.

1.1 The EU Aviation Directive

A 2008 directive on aviation emissions (2008/101/EC) extended the EU emissions trading system to aviation, requiring airline operators to deliver emission allowances based on the amount of carbon dioxide emitted during flights to and from EU airports. The directive went into effect in January 2012 and had strong CBA-like features. It is to date the only attempt to impose such a measure at international level.

A 'coalition of the unwilling' comprising 23 countries, including Brazil, China, India, Japan, Republic of Korea, Mexico, Nigeria, Russia and the United States, strongly opposed the directive in a joint declaration (Aviation, 2012). Their statement included a list of nine retaliatory actions (including '[a]ny other actions/measures') that might be taken by coalition members if the EU did not withdraw the directive. Several of these countries, including China and India, explicitly forbade their carriers from obeying the directive, and the US adopted legislation to this effect that could be invoked by the administration. Faced with such reactions, and in view of some progress in multilateral negotiations on emissions controls at the International Civil Aviation Organisation (ICAO), the EU withdrew the measure for intercontinental flights.

Importantly, the very strong negative reactions to the directive were not a response to its economic impact, which would have been quite marginal even for long-distance flights. Instead, the main source of contention was that the directive was perceived as imposing an extra-territorial regulation: the tax was based on total fuel consumption during intercontinental flights, and thus on activities taking place in other countries' airspace and over international waters. The clear message to learn from the attempt is that the EU should expect very strong negative reactions to measures that trading partners perceive as violating their sovereignty.

1.2 The lack of CBA mechanisms internationally

As of 1 November 2019, 21 national jurisdictions outside the EU (counting the UK as a non-EU country) had implemented or scheduled a domestic price initiative on carbon[1], but none of these jurisdictions had implemented a CBA scheme. There were also 25 schemes implemented at sub-national level. Furthermore, 14 other national jurisdictions were considering introducing such initiative. These schemes vary greatly in coverage, and in the resulting price on carbon emissions.

Among the OECD countries with a carbon pricing scheme, several have trade agreements with the EU. These countries are of interest from an EU perspective since they are likely to share basic views regarding the regulation of carbon emissions with the EU.

OECD countries with both carbon pricing schemes and trade agreements with the EU are Canada, Chile, Iceland, Japan, Norway, South Korea and Switzerland. The case of Canada is a bit special, owing to its federal structure. Several Canadian provinces and territories have long implemented some form of carbon pricing scheme. Since 2019, carbon pricing also applies throughout Canada through a federal legislation that imposes a minimum level of pricing to all the provinces and territories. New Zealand, which is currently negotiating a trade agreement with the EU, maintains one of the most ambitious carbon pricing

[1] This subsection draws on the World Bank Carbon Pricing Dashboard; see https://carbonpricingdashboard.worldbank.org.

mechanisms in the world, besides the EU ETS. Finally, the United Kingdom also has a carbon pricing scheme.

The situation of China is also of interest since it is both a major emitter of greenhouse gases, and one of the EU's main trading partners. Since 2013, China has run regional emissions trading schemes, which currently exist in eight regions. These regional schemes are meant to prepare for China's launch of a national emissions trading scheme, scheduled to be introduced in 2020. The national scheme will initially only apply to the power sector, but it might later be expanded to cover seven other emissions-intensive sectors.

The introduction of a national trading scheme could be an important step for China to deliver on its intended nationally determined contribution to the objective of the Paris Agreement. At the same time, however, we note that, at the COP 25 meeting in Madrid in December 2019, China expressed dissatisfaction with insufficient climate financing commitments by advanced countries, suggesting that perhaps China´s own commitments are conditional on yet to be determined financial contributions by advanced countries. At this stage, we find it hard, therefore, to assess China's actual position on the Paris Agreement.

Policymakers in countries with carbon-pricing schemes have no doubt been aware of the potential for carbon leakage and reduced competitiveness of their domestic industries, and of the option of addressing those implications with CBAs. It bears repeating that they have so far chosen not to implement such schemes.

It seems plausible that a combination of factors has contributed to the lack of CBA schemes. One is that carbon-pricing schemes have for the most part not been ambitious enough to generate significant leakage and lost competitiveness for domestic industries. A second factor is that jurisdictions that have introduced carbon prices have often addressed concerns about leakage and competitiveness through exemptions for threatened domestic industries, or by issuing free allowances of emissions certificates.

However, the fact that no national jurisdiction has implemented a CBA might also suggest that the fear of retribution by trading partners has played a role.

1.3 The US debate

More than decade ago, several climate bills and proposals that included some form of CBA mechanism were discussed by the US Congress, but none entered into law. Examples include: the bipartisan Low Carbon Economy Act of 2007 submitted by Jeff Bingaman and Arlen Specter; the bipartisan America's Climate Security Act of 2007 by Joe Lieberman and John Warner; and the American Clean Energy and Security Act of 2009 by Henry Waxman and Edward Markey.

Several climate proposals that included CBAs have also been discussed more recently by the US Congress. Examples include: the American Opportunity Carbon Fee Act of 2018 introduced by Senators Whitehouse and Schatz and Congressmen Blumenauer and Cicilline; the Climate Protection and Justice Act of 2015 by Senator B. Sanders; and Joe Biden's 2019 Plan for a Clean Energy Revolution and Environmental Justice.

The above-mentioned proposals have all been introduced by Democrats. But there have also been calls for climate action by Republicans, albeit outside of Congress. One example was the Conservative Case for Carbon Dividends in 2017, endorsed by former secretaries of state, secretaries of the Treasury and chairs of the Council of Economic Advisers during Republican administrations.

There have also been high-profile calls from academics for action on the climate that involve CBAs. Most significantly, in 2019 more than 3500 economists, including 27 Nobel laureates and 15 former chairs of the Council of Economic Advisers, jointly made a bipartisan declaration on the need for US carbon taxation, supported by a CBA (See Akerlof et al, 2019).

Outside of the Trump Administration, therefore, there seems to be some support among US politicians and economists in favour of a US climate policy that includes a CBA mechanism.

1.4 The Californian CBA for electricity

California has had, since 2011, a cap-and-trade programme that includes a CBA mechanism for imports of electricity into the state (see Pauer, 2019). Californian electricity imports come from other US states, from northern Mexico and some Canadian provinces. However, the CBA mechanism was watered down shortly after its adoption because of pressure from a group of Californian utilities. Several observers consider it to be ineffective as a result.

The Californian CBA mechanism was introduced without opposition from Canada or Mexico. But the trade volumes involved are very small: Canada and Mexico accounted for less than 0.5 percent of Californian electricity consumption in 2016.

2. Reactions to the announcement of the EU Green Deal

In this section, we assess the reactions of third countries to the announcement by the European Commission that, as part of the European Green Deal, it plans to propose a border carbon tax to avoid carbon leakage.

Such an assessment is not easy since at the time of writing (in February 2020) all we know about the Commission's plan is what it announced in its European Green Deal Communication published on 11 December 2019:

'As long as many international partners do not share the same ambition as the EU, there is a risk of carbon leakage, either because production is transferred from the EU to other countries with lower ambition for emission reduction, or because EU products are replaced by more carbon-intensive imports. If this risk materialises, there will be no reduction in global emissions, and this will frustrate the efforts of the EU and its industries to meet the global climate objectives of the Paris Agreement.

Should differences in levels of ambition worldwide persist, as the EU increases its climate ambition, the Commission will propose a carbon border adjustment mechanism, for selected sectors, to reduce the risk of carbon leakage. This would ensure that the price of imports reflect more accurately their carbon content. This measure will be designed to comply with World Trade Organisation rules and other international obligations of the EU. It would be an alternative to the measures[2] that address the risk of carbon leakage in the EU's Emissions Trading System.'

Our assessment is based on two types of evidence: informal interviews with third-country representatives based in Brussels[3]; and foreign (non-EU) media reports. It should be emphasised at the outset that all the responses we received from foreign officials were prefaced by the remark that it was too early to offer official reactions, since the EU has not yet made concrete proposals, and therefore that their comments were personal.

We divide our assessment into four parts: positive and negative reactions by third countries to the principle of an EU CBA mechanism; concerns about the design of the EU CBA mechanism; criticisms of the EU in relation to the design of the EU CBA mechanism; and potential policy responses to EU CBA measures.

[2] Such as the free allocation of emission allowances or compensation for the increase in electricity costs.
[3] We met representatives from six G20 countries, three advanced and three emerging ones

2.1 Positive and negative reactions to the principle

Foreign officials and media that we consulted generally welcomed the European Green Deal as a potentially important contribution to meeting the objectives of the Paris Agreement. Foreign reactions to the CBA component of the European Green Deal were however more mixed. Here a distinction should be made between the principle of a CBA and the design of the EU CBA mechanism.

Views on the principle of a CBA ranged between quite positive and quite negative.

2.1.1 Like-minded countries

It seems plausible that an EU CBA has more chances of being accepted by countries that themselves have undertaken some form of carbon pricing initiative. Indeed, in a recent endorsement of a CBA scheme as a solution to leakage and competitiveness problems, The Financial Times' editorial board argued that an EU CBA mechanism 'offers the distant but tantalising prospect of the EU joining forces with like-minded nations to create 'climate clubs' big enough to prod laggards into faster emissions cuts' (See FT Editorial Board 2020).

The group of 'like-minded' countries with respect to the climate problem, and potentially to the introduction of a CBA, presumably includes the OECD countries, which already have carbon pricing schemes and have trade agreements with the EU. These countries comprise of Canada, Chile, Iceland, Japan, Norway, South Korea and Switzerland, plus New Zealand which has an ambitious carbon pricing mechanism and is currently negotiating a trade agreement FTA with the EU. The United Kingdom is also likely to join the group. It should be noted however that while seemingly like-minded with regard to the acceptance of the need to take action against the climate problem, none of these countries has announced formally or informally that it supports, or plans to introduce, a CBA mechanism.

The situation of Iceland and Norway is special. Together with Liechtenstein, these two countries are members of the European Economic Area (EEA), and as such operate the EU ETS scheme. They cannot, therefore, be considered as 'third countries' as far as the EU climate policy is concerned. Depending on the exact design of the EU CBA mechanism, they are likely therefore to have to apply it if and when the EU introduces the mechanism. Industry reactions to the EU BCA in these countries seem two-sided.

On the one hand, the energy-intensive sectors, including the electricity sector itself, seem to welcome the principle of a CBA. For instance, the president and CEO of Statnett, Norway's power grid system, recently wrote that 'Europe should champion the creation of…a [carbon border] tax. In fact, it could well be the single most important facet when it comes to meeting our climate ambitions' (Lont 2019). His argument was that a European CBA mechanism will position Europe as an attractive location for green production that consumers will demand in the coming years and protect European producers from 'cheap carbon intensive alternatives'. He also argued that a European CBA mechanism will bring trading partners to the negotiating table on climate issues. 'This will probably not move the US in the first round, but China will definitely be interested in sitting down with the EU to discuss how international carbon pricing can be more effective. Paying taxes to Europe will seem attractive, compared to the possibility of losing access to an important market. Acting together with the EU on climate change should be the first and best option. Hopefully, after some years, the US will follow – at least certain states could do so' (Akerlof et al., 2019).

On the other hand, sectors or companies that export their products to countries outside the EEA seem to be fearful that applying the EU CBA mechanism could lead to trade retaliation that would damage their exports.

2.1.2 Other countries

Countries on the negative side fell into two camps. The first comprised the minority that does not subscribe to the Paris Agreement – essentially the Trump Administration, which plans to formally withdraw from the Paris climate accord in 2020 (Strokes 2020). The second group comprised those who subscribe to the Paris Agreement, but claim that CBAs are contrary to the spirit if not the letter of the Agreement. This view was articulated, for instance, by members of the Chinese delegation (Liqiang 2019) to the United Nations climate change conference held in Madrid from 2-13 December 2019. Their argument was essentially that there is no need for CBAs under the Paris Agreement since all countries have agreed to implement relevant emissions policies. However, according to some analysts like Kortum and Weisbach (2016), 'it is not clear that on its own, [the Paris Agreement] eliminates concerns about leakage' (Kortum and Weisbach, 2016), even more so if some countries do not belong to the Agreement or do not abide by it.

Although the current US administration is clearly opposed to the Paris Agreement, and therefore also to CBAs, which would likely hit US exports to the EU in the event it ultimately withdraws from the Paris Agreement, there are others in the United States who favour ambitious domestic measures to eliminate carbon emissions and their accompaniment by a CBA system. A December 2019 Bloomberg article noted that 'Europe shouldn't let itself be dissuaded [by the US from introducing CBAs]. Plenty of smart [American] people think carbon border taxes are necessary, including Ben Bernanke and Alan Greenspan, both former heads of the Federal Reserve' (Bryant 2019). Both were part of the call by more than 3500 US economists referred to in the previous section (See Akerlof et al. 2019).

2.2 Concerns about the design

Regardless of whether they support the principle of a CBA mechanism, many of those we consulted voiced concerns about its actual design and implementation by the EU (or for that matter any other jurisdiction). The two main concerns are that the EU CBA mechanism could be protectionist and/or unfair. We examine both issues in turn.

Many of our interlocutors expressed the view that, even though they understand the logic and purpose of the EU CBA mechanism as a climate instrument, they are concerned that its design and implementation will transform it into a protectionist trade instrument. Press reports have largely echoed such concerns about 'green protectionism'.

Our interlocutors from emerging countries also voiced concerns about the unfairness of an EU CBA mechanism. They questioned the notion, advanced in the European Green Deal Communication, that their countries should share the same ambition as the EU. They argued that, in accordance with the Paris Agreement, they should be subject to lower climate targets because they are responsible for lower past emissions than the EU and other advanced countries. Hence, the EU CBA mechanism should not apply to them, or at least it should apply at a lower rate than the domestic EU carbon tax.

During our discussions, all our interlocutors from emerging countries cited one example to illustrate their concern that EU 'green' measures are sometimes both protectionist and unfair: the implementation of the EU's Renewable Energy Directive II (REDII), which will result in a gradual ban on counting palm oil toward the EU's target for the share of renewables in 2030. The ban decision results from a determination by the European Commission that palm oil is the only biofuel feedstock crop to be deemed as 'high-risk' in terms of the indirect land use change (ILUC) it causes.

The restriction on palm oil is viewed by Indonesia and other tropical countries that export it as a protectionist measure designed to favour alternative crops as a source of oil for biofuel, including rapeseed and soybeans, which are grown in Europe. This view seems to be shared also by emerging and developing countries which do not produce palm oil.

The classification of palm oil as 'high-risk' ILUC was also viewed as unfair by many of these countries for two different but complementary reasons. First, it was viewed as a unilateral decision by the European Union rather than the result of a bilateral or multilateral process involving palm oil-producing countries. Second, the use of ILUC, such as the conversion of tropical forest land to plantations, by advanced countries as a criterion to ban imports of certain products from developing or emerging countries is viewed as illegitimate by the exporting countries. They consider that advanced economies practiced deforestation on a massive scale in earlier times, both in their own territories and in many tropical countries, and that the correct approach to deal with the global deforestation problem must involve action by the advanced economies themselves.

2.3 Criticisms

All the foreign (non-EU) officials we met were critical of the fact that, so far, they have had *no dialog*ue with EU officials about the EU CBA mechanism, either bilaterally or multilaterally.

In our interviews, there was general sense that the EU should not pursue a unilateral approach to CBAs, but instead that it should engage in bilateral and multilateral discussions with its trading partners.

We sensed real frustration from close partners, with whom the EU has partnership agreements, about not being kept informed by the EU of its intentions about the CBA mechanism.

All our interlocutors referred to the two multilateral frameworks that are relevant as far as BCAs are concerned: the Paris Agreement and the World Trade Organisation. The European Green Deal Communication states that the EU CBA mechanism 'will be designed to comply with World Trade Organisation rules and other international obligations of the EU.'

The sense that we have is that our partners would like something more than assurances that the EU CBA mechanism will comply with the EU's obligations under the Paris Agreement and WTO rules. Partners want the design of the mechanism to be *discussed, or perhaps even negotiated,* within these two international fora.

A *China Daily* article written in Madrid during the UN 2019 climate change conference, and the day after the publication of the Green Deal Communication in Brussels, clearly stated the Chinese position: 'Lu Xinming, deputy director-general of climate change at China's Ministry of Ecology and Environment, said that such a tax would amount to unilateralism as does the US decision to withdraw from [the] 2015 Paris climate agreement' (Liqiang 2019).

This criticism by foreign diplomats seems to be dismissed by some influential European observers, who recently noted that '[…] commentators like to warn about the diplomatic turmoil such a measure would unleash in the delicate relations with other countries. While they are right that unilateral action by the EU will be unpopular with affected trading partners, as early reactions from the United States and China confirm, they seem to ignore the radically altered political context in which this option is currently being discussed. Frequent parallels drawn to the inclusion of international aviation in the European carbon market and the fierce backlash that decision triggered fall short: At the time, trade relations were strong, and Europeans cautious about disrupting sensitive negotiations on what would eventually become the Paris Agreement. Now, we not only have an open-ended climate treaty, but unilateral US action has set off a cascade of retaliatory trade restrictions that have deteriorated trade relations to a point not seen in decades' (Mehling et al. 2019).

Their view seems to be that Europeans should not feel bound by the Paris Agreement nor by WTO rules since the entire multilateral framework is anyway collapsing. This view was not shared by most of our interlocutors.

2.4 Policy responses

Finally, what will be the policy responses of the EU's foreign trade partners to the announcement by the von der Leyen Commission that it plans to introduce an EU CBA mechanism, and what would be the reaction if the EU goes ahead with such plan?

There are several possible options for the EU's trade partners. One is to do nothing, either now or later when the CBA mechanism is introduced. This seems unlikely if the Green Deal gathers political momentum within the EU and the plan turns into serious action. In this case, the EU would introduce significant domestic measures to reduce carbon emissions, and such measures would be accompanied by CBAs that will affect EU trade in an equally significant manner. Given the size of the EU market, one would expect that trade partners will act or react accordingly.

A second option would be to adopt domestic measures commensurate with the high level of ambition that the EU seeks for itself and other countries. If this were the case, the need for EU CBAs would disappear. This is essentially what President von der Leyen said at the World Economic Forum Annual Meeting in Davos in January 2020. According to the *Financial Times*, von der Leyen said she was encouraged by Beijing's attempts to impose a domestic carbon price to avoid being hit with an EU CBA, but warned this was just a 'first step towards a level playing field'. She added 'If this turns into a global trend, we will have a global level playing field where no carbon border tax will be necessary' (Kahn and Rachman 2020).

But it is unlikely that all countries will adopt appropriate measures to have a global level playing field. In that case, a third option for the countries deemed by the EU as not having adopted 'appropriate' measures, will be to challenge the EU. Such action could take a range of forms, from litigation at the WTO to the implementation of countermeasures.

In our conversations with foreign diplomats, it was clear that the first option – that the EU's trade partners will do nothing – was the least likely. It was not clear, however, whether option two or three would more likely as far as their countries were concerned. No-one told us that their country would be likely to increase its climate ambition because of the EU CBA plan, nor that it would plan to retaliate against EU imports, although several indicated that litigation at the WTO would be likely. Many told us that they will be closely watching how China and the United States react.

As far as the United States is concerned, Wilbur Ross, the US Commerce Secretary told the Financial Times that 'Depending on what form the carbon tax takes, we will react to it — but if it is in its essence protectionist, like the digital taxes, we will react' (Tett, Giles and Politi 2020).

3. Discussion

What can we conclude about the possible responses of the EU's main trading partners to an EU CBA mechanism, if implemented?

First, the reactions of trading partners do matter. We thus disagree with the occasional argument that that the trading system is already in such disarray that the cost of further souring relations with trading partners would be very small. With the exception of the US, and to a lesser extent the countries that have been most severely hit by the tariff increases imposed by the current US administration, WTO members seem to largely respect their commitments in relation to tariffs and probably also other policies. There is also continuing daily cooperation between WTO members in many areas to remove trade barriers and to ease trade tensions. There would thus be a lot at stake if the WTO were to be threatened.

Second, in our discussions with officials, it was said that any conflict over an EU CBA mechanism will be played out mainly between the EU and the other two economic giants, China and the US. These countries are also among the EU's biggest trading partners. It is therefore of crucial interest to determine their likely

reactions. If the current US administration remains in power after 2020, the US will be a likely target of an EU CBA mechanism, and it also seems likely that the US will take countermeasures. It is noteworthy however that there is widespread support for federal climate measures among Democrats, and (seemingly) also among parts of the Republican Party. If these forces were to take over the administration, there is a high probability that the US will implement federal carbon pricing, supported by a CBA mechanism. This would tend to reduce the difference between EU and US carbon-pricing policies, and thus reduce US exposure to an EU CBA mechanism. It might also make it less likely that the US will argue against an EU CBA mechanism.

With China, the situation is less clear, at least to us. Our impression is that they might be less opposed to the EU CBA mechanism itself, than to the process of the EU designing and implementing the measure unilaterally.

Third, and most important in our view, the reactions to an EU CBA mechanism will depend crucially on how it is introduced. The EU has projected itself as a defender and promoter of a rules-based multilateral order in terms of both trade at the WTO and climate policy under the Paris Agreement. One of the main messages from our interlocutors in our interviews was that it would sound odd, therefore, if the EU were to pursue a unilateral track with respect to a CBA mechanism without first, or at least in parallel, pursuing a multilateral, or plurilateral, track at the WTO and/or within the framework of the Paris Agreement.

Fourth, trading partners are concerned about the possibility that an EU CBA mechanism would be used for protectionism rather than climate preservation. It will therefore be important that any CBA mechanism should be designed to be highly transparent and non-manipulable by special interests. Pursuing a multilateral approach would also go some way to allay fears of protectionism.

Fifth, some trading partners believe they might be unfairly targeted by an EU CBA mechanism, because they have not contributed as much as industrialised countries to the climate problem, or because of their lower income levels. Addressing this issue will probably be one of the most difficult aspects of the design of a CBA mechanism. Again, pursuing a multilateral approach, especially within the framework of the Paris Agreement, would put to rest some of these concerns.

Sixth, it seems plausible that international reactions to an EU CBA mechanism will depend on how broadly the scheme's scope will be. One option would be for the CBA scheme to only target *a few pollution-intensive sectors*, rather than a scheme that applies across most or all traded products. This seems to be the option chosen by the von der Leyen Commission, which announced in its European Green Deal Communication a CBA mechanism for 'selected sectors'. A narrower approach will plausibly spark fewer adverse reactions from trading partners, for several reasons. First, applied narrowly, the CBA will be smaller in magnitude and thus less confrontational. Second, provided the choice of sectors is appropriate, the CBA mechanism would undeniably target a significant problem. Third, a scheme that only applies to a few sectors will be more transparent than a scheme that applies across a broad range of industries, and will be thus less open to protectionist abuse, especially if the sectors involved have fairly simple production technologies. As we have noted, the possibility for protectionist abuse worries EU trading partners. It will be important however, for the EU to have considerable domestic production in the targeted sectors. Otherwise the scheme will be seen as protectionist, and likely trigger countermeasures and/or WTO disputes.

Finally, another avenue to explore might be to develop customs classifications that would make it easier to distinguish between products according to their carbon footprints. The World Customs Organisation (WCO) should be involved in such a process. Our discussions with members of the WCO Secretariat indicated an awareness of the issue, but also that any initiative would have to come from WCO members.

In conclusion, we tend to agree with those who argue that the actual implementation of EU CBAs would be fraught with dangers for international relations. But we also recognise that the threat of such CBAs could

be helpful in advancing towards a world with net-zero carbon emissions. The challenge, therefore, will be to design an EU CBA mechanism in such a way that it minimises the potential costs to the international system, while maximising the chances that it reduces global carbon emissions. In our view, the best way to meet this challenge would be to pursue a two-track approach during the design phase, with one track involving EU stakeholders, and one track involving foreign partners. The second track should be pursued both bilaterally (especially with countries that are parties to EU trade agreements) and multilaterally at the WTO and within the framework of the Paris Agreement.

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