A proposal for the design of an European Carbon Border Adjustment Mechanism (‘CBAM’)
1. Why do we need a CBAM?
Multilateral efforts have been hampered by their non-binding nature and lack of mechanisms to avoid free riding.

In spite of 30 years multilateral efforts on climate change, **70% of global carbon emissions are still not subject to any pricing mechanism**, resulting in an unsustainable equilibrium: **global greenhouse gas emissions have increased by more than 40% since 1990**.

**Summary map of implemented carbon pricing initiatives**

- **Implemented initiatives (green = ETS, purple = carbon tax)**

**World greenhouse gas emissions evolution**

- **Mt of CO₂ equivalent**
- **+41% increase (equivalent to an annual 2.2% increase)**

In this context, the EU has set unilateral climate targets

Europe has set unilateral ambitious targets in terms of reduction of greenhouse gas emissions. It has done so by defining emissions targets for key sectors of its economy:

- **The EU's first package of climate and energy measures was agreed in 2008 and sets targets for 2020**:
  - Reducing greenhouse gas emissions by 20% (compared to 1990)
  - Increasing the share of renewable energy to 20%
  - Making a 20% improvement in energy efficiency

- **EU leaders have agreed (in December 2020) on a binding EU target for a net domestic reduction of at least 55% in greenhouse gas emissions by 2030** compared to 1990

- **In December 2019, EU leaders endorsed the objective of achieving a climate-neutral EU by 2050**

To achieve these climate goals, the EU has developed the EU emissions trading system (ETS) which aims to cut down greenhouse gas emissions in particular from energy-intensive industries and power plants.

The EU ETS is the cornerstone of the EU’s policy to combat climate change.

- It is the world’s first major carbon market (created in 2005) and remains the biggest one.
- It operates in all EU countries plus Iceland, Liechtenstein and Norway.
- It limits emissions from more than 11,000 heavy energy-using installations and airlines.
- Overall, it covers around 40% of the EU’s greenhouse gas emissions.
A “cap and trade” carbon market

The EU ETS works on the 'cap and trade' principle, a market based approach to price carbon emissions

How does the EU ETS works?

- A cap is set on the total amount of certain greenhouse gases that can be emitted by installations covered by the system. The cap is reduced over time so that total emissions fall.

- Within the cap, companies receive or buy emission allowances, which they can trade with one another. Trading of allowances brings flexibility that ensures emissions are cut where it costs least to do so.

- As the cap decreases over time, the price CO2 emissions increases. A sufficiently high carbon price promotes investment in clean, low-carbon technologies.

Illustration

- Cap (decreases each year)

- Installation #1

- Installation #2

- SURPLUS → SOLD TO → MEET DEFICIT
A rising carbon price

As the cap decreases over time, the price CO₂ emissions increases. As the price of CO₂ emissions increases, the alternative, investing in decarbonisation technologies, becomes relatively cheaper...

...has lead to an increase in carbon prices

Progressive reduction of the cap ....

Gigatones of CO₂

EU ETS allowance price, in €/tCO₂

In order to meet its objective of climate neutrality by 2050, the EU will need to make significant de-carbonization efforts. As a result, the carbon price is expected to significantly increase, likely well beyond the current price.

Source: EEX, EU primary auction spot data (latest price May 7 2021)
However, in the absence of global price for carbon, unilateral efforts are doomed to accelerate “carbon leakage”

In the absence of a global price on carbon emissions, unilateral efforts are doomed to accelerate “carbon leakage” dynamics: **moving production outside of regions with carbon pricing schemes towards countries with laxer climate policies** (that find themselves at a competitive advantage)

This “offshoring of emissions” trend is already alive and well in Europe

- While the **EU has managed to reduce its carbon emissions by 21%** between 1990 and 2018 (introduction of the EU Emissions Trading Scheme in 2005, the first & largest carbon market)
- This reduction has been **offset by the increase in net imports of carbon** from third countries, by **28%** in the same period

As a result, domestic production is replaced by cheaper and more polluting imported goods, while world carbon emissions increase

Source: Our World in Data, Peters et al. (2012) and the Global Carbon Project (2018), author analysis
A CBAM would help sustain the pricing of carbon emissions while leveling the playing field.

Current system (goods consumed in the EU):
- EU plant
- Non-EU plant

EU plant
Cost of production + CO₂ cost (EU ETS) - Subsidy (free allowances)

Cost of production

Non-EU plant

System with the CBAM (goods consumed in the EU):
- EU plant
- Non-EU plant

EU plant
Cost of production + CO₂ cost (EU ETS) + CBAM

Cost of production

Non-EU plant

Costs are equalized only if CO₂ cost equals subsidy, but then the EU carbon pricing is useless.
- Otherwise, EU plant at a competitive disadvantage

Costs are equalized both inside and outside the EU as long as CBAM mirrors EU CO₂ cost.
- Carbon pricing is applied to all EU consumed goods.
A Carbon Border Adjustment Mechanism (CBAM) is needed

By ensuring that the price of imports reflects their carbon content, the CBAM will reduce the risk of carbon leakage, while providing incentives to our trade partners to start pricing carbon

• In the absence of a CBAM, producers from other regions of the world that are not subject to a carbon price will be increasingly advantaged relative to EU producers. This situation is not sustainable:
  × On the one hand, the planet does not improve, because the Earth does not care where the CO₂ is generated
  × On the other, it creates perverse incentives to move production outside of Europe (where regulation of carbon intensive production is less ambitious or inexistant)

• The CBAM would help assure that the EU’s green objectives are not undermined by the relocation of production or by increased imports from countries with less ambitious climate policies
  ✓ The CBAM is required to support the EU’s unilateral decarbonisation efforts
  ✓ It will also create the incentives to our trading partners to start pricing carbon and/or shift towards greener energy sources
  ✓ Hence helping reduce global greenhouse gas emissions
Towards a Climate Club

As proposed by William Nordhaus during his Nobel prize speech, the development of climate clubs can help solve the free riding problem. The CBAM is the key element to develop such “climate clubs”

Members of the Climate Club

- Have carbon pricing schemes
- Commit to carbon neutrality in the medium term
- Invest in climate abatement

Non members

- Are penalized through “penalty tariffs” on export to the club region
- Such “penalty tariffs” are a CBAM

Through the introduction of these properly designed CBAM, one can envision an end state in which the number of members of such club is sufficiently large, and the tariffs sufficiently high, that all have an incentive to contribute to carbon abatement and “join the club”
2. Key proposed design elements of the CBAM
Key elements of the European Parliament proposal

• On February 15th, the European Parliament approved its proposal for the implementation of a WTO-compatible EU Carbon Border Adjustment Mechanism

• Objectives:
  - Fight climate change by incentivizing investments in green and energy efficient technologies
  - Support the EU’s climate objectives by addressing the risk of carbon leakage

• Constraints:
  - The CBAM should clearly and exclusively be designed to support climate objectives and not be misused as a tool to enhance protectionism
  - It should also be in compliance with World Trade Organization rules
Aim: it needs to have a clear environmental objective

Key design parameters to ensure the environmental objective & WTO compatibility

• The CBAM will mirror the price being charged to EU producers, and cover the same sectors
  ➢ Ensuring fairness and non-discrimination between domestic producers and foreign importers

• It would avoid importers pay twice for the carbon content embedded in their products, taking into consideration existing carbon pricing measures in third countries
  ➢ Incentivizing trade partners to introduce carbon pricing schemes

• It would also allow importers to demonstrate their real carbon emissions level (if they were to be more efficient than carbon intensity benchmarks)
  ➢ Incentivizing decarbonization investments at production plant level
Policy instrument: it should be based on the EU ETS

Between the three main policy options available, the ECON Opinion recommends designing the CBAM as an instrument based on the EU ETS, in order to mirror the carbon costs paid by EU producers.

(i) Excise duty/tax on consumption

❌ It would not fully address the risk of carbon leakage

❌ Technically challenging given the complexity to trace carbon in global value chains (if design in a similar way as the VAT);

❌ Lack of public and political support;

(ii) Customs duty/tax on imports

❌ Fails to ensure WTO compatibility given its fixed nature in relation to the evolving price of the EU ETS;

❌ Could be perceived as a protectionist measure by trade partners;

(iii) Instrument based on the EU ETS

✅ It facilitates WTO-compatibility as a “mirror” system of the EU ETS, hence avoiding discrimination between domestic producers and foreign importers;

✅ It ensures automatic price adjustment at the same level as domestic producers are paying;

✅ It avoids an additional burden on EU producers, who already face de-carbonization policies through the ETS;

✅ It will be easier to approve => qualified majority in the Council unlike the unanimity required by fiscal measures;

✅ It will benefit from stronger public support.
Scope: it should cover the same products as the EU ETS

While it might seem intuitive or preferable to “start small”, we believe that this might be a very dangerous position that might backfire in some sectors

- Potential distortions that might arise if the CBAM does not cover all the same sectors as the EU ETS
  - Distortions between “substitute products” in the domestic market
    - If only a subset of sectors is covered, this might trigger significant substitution effects and competition distortions between sectors
  - Distortions between raw materials and intermediate or end-products:
    - Might exacerbate the risk of carbon leakage in the production of raw materials

- Although it might prove challenging from a technical and administrative perspective, we believe there is a feasible way to implement such a broad scope (through the weight of raw materials in imported products)

- If it were to be too challenging to cover all basic materials covered by the EU ETS as early as 2023, then sectors deemed to be at highest risk of carbon leakage might be prioritised (initial Commission proposal is likely to do this)
Example of distortions that could erase if only a subset of sectors were to be covered by the CBAM

• We use here the cement sector as an example

Basic materials covered by the EU ETS

<table>
<thead>
<tr>
<th>Fuels / refined mineral oil</th>
<th>cement / clinker</th>
<th>paper</th>
<th>ammonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>steel</td>
<td>lime</td>
<td>cardboard</td>
<td>hydrogen</td>
</tr>
<tr>
<td>iron</td>
<td>glass</td>
<td>acids</td>
<td>synthesis gas</td>
</tr>
<tr>
<td>aluminium</td>
<td>ceramics / bricks</td>
<td>chemicals</td>
<td>soda ash</td>
</tr>
<tr>
<td>Metals (ferrous and non-ferrous)</td>
<td>pulp</td>
<td>Mineral wool</td>
<td>sodium bicarbonate</td>
</tr>
<tr>
<td>Coke</td>
<td>fertilizers</td>
<td>Carbon black</td>
<td>Metal ore</td>
</tr>
</tbody>
</table>

Through the cement example we see that if we were only to cover a subset of basic materials covered by the EU ETS (the ones highlighted in orange here), there would be a strong risk of generating distortions and substitution effects among sectors within the EU domestic market (with potentially irreversible damage)

Assessment method (econ opinion only): trade-off between accuracy and feasibility

Obtaining the actual level of carbon emissions for every imported product is unfeasible. This is why a feasible approximation is needed. The proposal is to measure the carbon content of imports using the weight of the raw material embedded in the products and multiplying them by a default carbon intensity values.

<table>
<thead>
<tr>
<th>Carbon content of a product =</th>
<th>Weight of basic materials</th>
<th>Carbon intensity value per product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess the GHG emissions of imported products through the carbon content embedded in the basic materials, excluding from the calculation the emissions related to industrial processes or logistical transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ <strong>Good approximation</strong> (more than c.90% of the emissions are embedded in the basic materials)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ <strong>Feasible</strong> (only traceable elements are considered)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Provides <strong>undisputable evidence</strong> for the determination of the tax base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o <strong>Differentiated carbon intensity values</strong> (by country)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Better approximation, however, issues about the reliability of the data may arise and higher administrative burden (tracing needs)</td>
<td></td>
</tr>
<tr>
<td>o <strong>Uniform default values</strong> (same for all countries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technically and administratively feasible</td>
<td></td>
</tr>
<tr>
<td>o <strong>In parallel, importers should be allowed to demonstrate if their specific production process is more carbon efficient</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assessment method (II)

Application example: imported car

1. Determining the tax base: basic materials under the ETS embedded in the product

<table>
<thead>
<tr>
<th>Basic Materials</th>
<th>Mass</th>
<th>Direct emissions GHG intensity</th>
<th>Indirect emissions GHG intensity</th>
<th>GHG content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit</td>
<td>tonnes</td>
<td>t CO2 equivalent / t of product</td>
<td>t CO2 equivalent / t of product</td>
</tr>
<tr>
<td>Steel</td>
<td></td>
<td>2,50</td>
<td>1,75</td>
<td>1,12</td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td>0,15</td>
<td>0,91</td>
<td>1,23</td>
</tr>
<tr>
<td>Aluminum</td>
<td></td>
<td>0,80</td>
<td>1,44</td>
<td>2,37</td>
</tr>
<tr>
<td>Polyethylene</td>
<td></td>
<td>0,25</td>
<td>0,88</td>
<td>0,42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3,70</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. "Taking" the tax price

<table>
<thead>
<tr>
<th>EU ETS market price</th>
<th>in € / tonne CO2 equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

3. Total CBAM price for the car

| Total CO2 equivalent emissions | tonnes | 10,87 |
| Direct emissions (scope 1)    | tonnes | 5,88  |
| Indirect emissions (scope 2)  | tonnes | 4,99  |
| Price per tonne               | € / tonne CO2 equivalent | 35    |
| Total price                   | €      | 380,42 |
Articulation with existing EU ETS

**Current situation**: in the absence of the CBAM, free allocation of allowances represent the main mechanism to protect sectors at highest risk of carbon leakage.

**Benchmark determination**

- **Free allowances** based on a **production benchmark** based on top 10% performers

Source: European Commission
Articulation with existing EU ETS (II)

The implementation of the CBAM offers, from an environmental and fiscal perspective, the opportunity to abandon the free allocation of allowances (current EU subsidy to resource- and energy-intensive industries). A transition period should be considered for their progressive removal.

Phase out of free allowances

- The original spirit of the text was to clearly call for a removal of free allocation of allowances.
- However, this sentence had to be removed by a last-minute amendment approved in the Plenary Session of the European Parliament.
- The outcome of the vote reflected parliamentarians’ fears that the removal of free allocation of allowances would hurt European producers’ competitiveness.

Coexistence

CBAM and free allowances could coexist during the transition period without representing double compensation, as long as allowances allocated for free are also deducted from the CBAM.

- CBAM
- Paid allowances
- Free allowances
Articulation with existing EU ETS (III)

It is proposed to **couple the removal of free allowances with the introduction of partial export rebates** in order to address the risk of carbon leakage in export-oriented sectors, while keeping strong decarbonisation incentives.

**Rationale for the introduction of partial export rebates**

- The CBAM ensures a level playing field in the domestic EU market. However, the position of EU producers will be exacerbated in foreign markets as free allowances are removed.

- The phase out of free allowances should be accompanied by the introduction of export rebates, in order to address the risk of carbon leakage in export-oriented sectors.
Articulation with existing EU ETS (IV)

During the transition period free allowances would be phased out and partial export rebates would be "symmetrically" introduced \(\text{(dates are just for reference – non-binding – just an example)}\)

**Domestic EU Market** -> progressive phase out of free allowances as CBAM ensures level playing field

**EU Exports** -> progressive introduction of partial export rebates (up to the current level of free allowances)
WTO compatibility

We believe the proposal complies with the 1994 General Agreement on Tariffs and Trade ("GATT") and its two main basic principles

1. **Non-discrimination between imported and domestic goods** (art. III.2 GATT)

   - The extension of the EU ETS ensures that the proposed CBAM applies to "like" domestic products;
   - Both domestic producers and importers would pay exactly the same carbon price;
   - The transition period for ending the allocation of free allowances does not entail a discriminatory treatment, as those free allowances would also be deducted from CBAM;
   - Importers have the opportunity to demonstrate the specific carbon content of their imports in order to avoid a discriminatory treatment in the assessment process (Gasoline case, WTO 1996);

2. **The Most-Favoured Nation clause** (art. I.1 GATT)

   - The method to determine the carbon content is the same for all imports (i.e. weight of each basic material in the final product multiplied by a carbon intensity value);
   - Allowing importers to deduce the carbon price already paid in their home country is not discriminatory, given that the same conditions do not prevail in third countries.
WTO compatibility (II)

Should some of the proposed design features of the CBAM be challenged, we can resort to Article XX

Art XX: “Nothing in the GATT shall prevent the adoption of measures”:

• b) “necessary to protect human, animal or plant life or health”

• g) “relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption”

Art. XX also requires that measures are not applied in a manner that would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade

✓ Importers can prove that they perform better than the default values => incentives to reduce their emissions;

✓ Importers do not pay twice for the carbon content of their product (thus, not a disguised protection of EU industries);

✓ The proposed design implements the phasing out of free allowances;

✓ Export rebates, as designed in this proposal, will help prevent carbon leakage while at the same time provide incentives to EU producers to be more carbon efficient

✓ A significant % of the revenues will be devoted to climate measures through the EU budget
Thank you for listening
Appendix
Articulation with existing EU ETS – focus on export rebates

The proposed mechanism will never provide a higher level of free allowances than the already existing system

<table>
<thead>
<tr>
<th>Percentage of production being exported</th>
<th>Existing mechanism (free allocation of allowances)</th>
<th>Proposed mechanism (partial export rebates)</th>
<th>Alternative (full export rebates)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
</tr>
<tr>
<td>50%</td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
</tr>
<tr>
<td>100%</td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
<td><img src="#" alt="Exports" /> <img src="#" alt="Domestic market" /></td>
</tr>
</tbody>
</table>

Percentage of emissions paid by the average European producer depending on the selected mechanism and percentage of exports *

<table>
<thead>
<tr>
<th>Percentage of production being exported</th>
<th>Free</th>
<th>Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>50%</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>100%</td>
<td>20%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Note: *assuming that the benchmark level based on top 10% performers represents 20% of the emissions level of the “EU average producer”