GIZ – Carbon Pricing Training for Members of the Energy Community

Carbon tax vs. ETS

Dr. Constanze Haug, Dr. Lina Li
25 February 2022
Outline

1. Recap: Functioning of carbon tax and ETS
2. Similarities of carbon tax and ETS in design, functioning, and effects
3. Differences carbon tax vs ETS in design, functioning, and effects
4. ETS vs. carbon tax
5. Hybrid systems
6. CBAM
ETS and carbon taxes have in common that...

A. They require robust MRV  
B. They rely on the principle of supply and demand in the carbon market  
C. They guarantee a certain emissions outcome

The voting code 3403 9219
ETS and carbon taxes differ in that...

A. ETSs do not always generate government revenue
B. ETS is always popular with stakeholders
C. Only carbon taxes require an emissions registry
Recap: Functioning of carbon tax and ETS
How do emissions trading system (ETS) and a carbon tax work

**ETS**
- Government imposes a **limit on total emissions** in one or more sectors
- Regulated companies need to submit **one permit for every ton of emissions**
- Government allocates or auctions permits to companies,
- Regulated companies **can trade permits** with one another

**Carbon tax**
- Government sets a **tax rate for every ton of CO₂ emitted** in one or more sectors
- Regulated companies are **obliged to pay the carbon tax associated with their annual CO₂ emissions**
ETS and Carbon Tax in Europe

Source: World Bank, Carbon Pricing 2021
Case study: EU ETS and Slovenian carbon tax

**INSTRUMENTS** – Slovenia has applied a carbon tax (transport and buildings primarily) since 1996 and joined the EU ETS (energy, industry) upon accession to the EU in 2004.

**PRICE** – Price in EU ETS: now >80EUR/ton; average price of carbon tax: 17,3 euro/ton. Earlier declarations have indicated that CO2 tax should increase (at least 5% per year) to approach the ETS price by 2030.
Similarities of carbon tax and ETS
Similarities between carbon tax and ETS – function and effects

1. Impose an explicit price on carbon
2. Cost effectiveness and flexibility for covered entities
3. Fit different economic and political profiles
4. Stimulate low-carbon technology innovation
5. Co-benefits (environmental, health, economic, social)
6. Raise government revenue
### Similarities of carbon tax and ETS – design

Many of the building blocks for tax and ETS are the same:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sector coverage:</strong></td>
<td>Cover specific sectors and greenhouse gases</td>
</tr>
<tr>
<td><strong>Cover entities at a point</strong></td>
<td>along the production chain (downstream vs. upstream)</td>
</tr>
<tr>
<td><strong>Exclude small entities via thresholds</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Monitoring, reporting and verification (MRV)</strong></td>
<td>of emissions, and enforcement</td>
</tr>
<tr>
<td><strong>Enable offsets to replace some of the compliance obligations</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Provisions to prevent unwanted impacts for the economy and consumers (leakage)</strong></td>
<td></td>
</tr>
</tbody>
</table>
Differences of carbon tax and ETS
After having learned about the similarities of carbon taxes and ETS, what differences between both instruments can you think of?
## Differences of carbon tax and ETS – function and effects

<table>
<thead>
<tr>
<th>Carbon tax</th>
<th>ETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Government sets the price of emissions by setting a tax rate</td>
<td>• Government sets the quantity of emissions by setting the cap</td>
</tr>
<tr>
<td>➢ Provides a predictable carbon price, but less certainty about the overall emissions</td>
<td>➢ Provides certainty to meet a mitigation target, but less certainty about the price</td>
</tr>
</tbody>
</table>
Differences of carbon tax and ETS – objectives

Objectives for introducing a carbon tax or an ETS can be many and diverse, there are some typical differences:

**Carbon tax**
- Internalizing the externality (social cost of carbon)
- Making the tax system more efficient and effective
- Generating tax revenue

**ETS**
- Achieving a set pathway for future emission levels
- Introduction of an “economically friendlier” climate mitigation instrument than a carbon tax
- Opportunity to cooperate in a global carbon market through linking or aligning carbon markets
## Differences of carbon tax and ETS - design

<table>
<thead>
<tr>
<th>Carbon tax</th>
<th>ETS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope and coverage:</strong></td>
<td><strong>Scope and coverage:</strong></td>
</tr>
<tr>
<td>- Fossil fuels or sector-specific emissions</td>
<td>- Sector-specific emissions are covered</td>
</tr>
<tr>
<td>- Reporting at company level</td>
<td>- Reporting at company or installation level</td>
</tr>
<tr>
<td><strong>Setting the tax rate</strong></td>
<td><strong>Setting the cap</strong></td>
</tr>
<tr>
<td><strong>Flexibility provisions:</strong> Only offsets</td>
<td><strong>Flexibility provisions:</strong> Offsets, banking and borrowing of allowances, multi year compliance periods</td>
</tr>
<tr>
<td><strong>Competitiveness:</strong> Exemptions, reduced rates, rebates, revenue recycling</td>
<td><strong>Competitiveness:</strong> Free allowance allocation, revenue recycling</td>
</tr>
<tr>
<td><strong>MRV:</strong> When covering upstream fuels, MRV framework often already in place</td>
<td><strong>MRV:</strong> Robust MRV always needed to ensure compliance</td>
</tr>
</tbody>
</table>
ETS vs carbon tax
ETS versus carbon tax

**Carbon tax**
- **Stable price** - uncertainty about of emissions reductions
- **Limited flexibility** for regulated entities
- More difficult to adjust for economic and external conditions since tax rate has to be changed
- International cooperation difficult – linking carbon taxes not yet an option

**ETS**
- **Certainty of reaching emissions targets** - fluctuating price
- Greater flexibility in reducing emissions (offsets, banking, borrowing)
- Carbon price adjusts automatically for economic and external conditions, but might lead to price volatility
- ETSs can be linked enabling international cooperation through larger markets
ETS vs. Carbon tax – capacity requirements

Figure 8  Capacity requirements may differ for different CPIs

- **Compliance**
  - Credible enforcement mechanisms and punishments for emissions liabilities
  - Clear lines of responsibility
  - Access to emissions verification or auditing service providers

- **MRV**
  - Monitoring and reporting institutions for other policies (such as taxes) or standalone data gathering and reporting system
  - Established data collection processes
  - Access to verification services

- **Market oversight**
  - Financial market regulation that provides stability and punishes misconduct
  - Businesses’ ability and willingness to comply with regulation

- **Trade infrastructure**
  - Registry for holding/trading units
  - Liquid market, operating through exchange based trading
  - Internal carbon risk management processes

- **Allocations**
  - Production and emissions data for determining free allocations
  - Understanding of allocation design and competitiveness implications

Transitioning from the tax to the ETS

*Introducing a carbon tax can provide a strong contribution to the preconditions of an ETS:*

<table>
<thead>
<tr>
<th>Contributions of a carbon price to the preconditions of an ETS</th>
<th>Options to increase contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity to involve stakeholders</strong></td>
<td>The stakeholder involvement processes can be used to gather views on ETS and gain insights into existing trading capacities.</td>
</tr>
<tr>
<td><strong>Institutional capacities</strong></td>
<td>When establishing new institutions and delegating authority to existing ones, functions and tasks that are relevant in the ETS context could be taken into account. Ensure tax rates properly reflect carbon content and that that is also monitored accordingly.</td>
</tr>
<tr>
<td><strong>Sectoral data and processing capacities</strong></td>
<td>Contribution can be strengthened if the tax processes high resolution data which can be translated into emissions data.</td>
</tr>
<tr>
<td><strong>MRV capacities/experience</strong></td>
<td>Ensure tax rates reflect actual carbon content (with sufficient fuel diversification) and that MRV requirements allow for tracking the actual carbon content of fuels.</td>
</tr>
<tr>
<td><strong>Trading capabilities</strong></td>
<td>Consider introduction of tradable tax credits. Introduction of such credits would allow development of trading capacities.</td>
</tr>
<tr>
<td><strong>IT infrastructure and capacities</strong></td>
<td>Record MRV data in database. Ensure database can technically be used as a basis for a registry at a later point in time by adding additional features.</td>
</tr>
</tbody>
</table>

Source: adapted from UBA, How can existing national climate policy instruments contribute to ETS development?, 2019
Exercise: carbon tax or ETS - which instrument would you consider (more) suitable for your home country and why?

<table>
<thead>
<tr>
<th>Assessment</th>
<th>... reinforces tendency for tax or ETS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic profile, sector structure - potential number of entities</td>
<td></td>
</tr>
<tr>
<td>Institutional capacity and readiness</td>
<td></td>
</tr>
<tr>
<td>Political feasibility of introducing carbon pricing</td>
<td></td>
</tr>
<tr>
<td>Sectors suitable for carbon pricing and possible market size – considering international cooperation</td>
<td></td>
</tr>
<tr>
<td>Prior domestic experience with market-based instruments</td>
<td></td>
</tr>
</tbody>
</table>

**Recommendation on instrument:**
Hybrid systems
Trend toward hybrid systems

ETS bears problem of price uncertainty
- the price of allowances is determined by market

Growing trend toward hybrid systems with ETS and carbon tax design elements

• “Price containment” and “market stability” measures as hybrid solution

Tax bears problem of emissions uncertainty
- the amount of emissions depends on how companies react to the fixed price

• “Emissions assurance” such as targets as a hybrid solution

25.02.2022
Key take-aways

- There are many similarities and differences in carbon tax and ETS function, effects, objectives, and design.
- Each instrument has its benefits and drawbacks, but both are mandatory market-based mitigation policies that impose an explicit price on carbon.
- The choice of the policy and design options depends on circumstances, e.g. emissions profile, climate ambition, legal framework, and political considerations/objectives.
- There is a growing trend toward hybrid systems that aim to manage price uncertainty in ETS and emissions uncertainty in carbon tax design.
The Fit for 55 Package and where CBAM fits

**PRICING**
- Stronger ETS including aviation
- Extending emissions trading to maritime, road transport, and buildings
- Updated Energy Taxation Directive
- New Carbon Border Adjustment Mechanism

**TARGETS**
- Updated Effort-Sharing Regulation
- Updated Land Use Land Use Change and Forestry Regulation
- Updated Renewable Energy Directive
- Updated Energy Efficiency Directive

**RULES**
- Stricter CO₂ performance for cars and vans
- New infrastructure for alternative fuels
- ReFuelEU: More sustainable aviation fuels
- Fuel EU: Cleaner maritime fuels

**SUPPORT MEASURES**
Using revenues and regulations to promote innovation, build solidarity and mitigate impacts for the vulnerable, notably through the new Social Climate Fund and enhanced Modernisation and Innovation Funds

Source: European Commission, 2021
Rationale for CBAM

AVOID CARBON LEAKAGE
- Greater emission reductions increase risk of carbon leakage and loss of competitiveness for the EU

CURRENT LEAKAGE PROTECTION
- Free allocation and indirect cost compensation
- Incompatible with long-term deep decarbonization

ROLE FOR CBAM
- Level playing filed between EU and foreign producers
- Ensure effectiveness of EU’s decarbonization
- Incentivize trading partners to increase domestic emissions reductions
CBAM design features

**TYPE OF POLICY INSTRUMENT**
- Tax
- Customs duty
- Extension of ETS

**COVERED SECTORS**
- Focus on selected sectors
- Wider scope regarding sector and products

**EMISSIONS SCOPE**
1) Direct emissions
2) Indirect from purchased electricity and heat
3) Other indirect from inputs/transportation

**DETERMINATION OF EMBEDDED CARBON**
- Actual emissions data VS. default values

**CREDITING FOR FOREIGN POLICIES**
- Explicit carbon prices VS. explicit and implicit policies
- Continuation of free allocation VS. CBAM as replacement

**LEAKAGE PROTECTION**
- EU general budget
- Domestic climate action
- Returned to trading partners

**REVENUE USE**
EU CBAM: design features based on the EC proposal

**TYPE OF POLICY INSTRUMENT**
- Extension of ETS but with parallel pool of allowances (‘CBAM certificates’) fixed to recent price of an EUA and no cap
- Coverage of trade flows: imports only

**COVERED SECTORS**
- Products from the cement, iron and steel, fertilizer, electricity and aluminium sectors (47% of direct industrial emissions)

**EMISSIONS SCOPE**
- Direct emissions (Scope 1)
- To some extent, Scope 3—“complex” goods
EU CBAM: design features based on the EC proposal

DETERMINATION OF EMBEDDED CARBON
AND ADJUSTMENT LEVEL

For goods:
• Based on actual emissions of the producer
• Fallbacks: default values based on average emissions intensity of exporting country-or 10% worst performing EU installations

For electricity:
• Based on the average emissions factor in each exporting country, group of countries, or region within a third country of the price-setting sources (fossil fuels)
• Actual emissions could be used under narrow circumstances (e.g. a power purchase agreement or where flows are clearly identified/nominated along all points in the interconnection)

Defining the adjustment level:
• the embedded emissions would be multiplied by a price that aligns with the value of an EU ETS allowance and would deduct the costs of carbon pricing in the country of origin
• The price would reflect the average closing price of EU ETS allowances during auctions for each calendar week
EU CBAM: design features based on the EC proposal

CREDITING FOR FOREIGN POLICIES
- Explicit carbon prices only
- **Effective** rather than **nominal** carbon prices because importers must demonstrate the carbon costs actually paid

STATUS OF EXISTING LEAKAGE PROTECTION
- Clear pathway to phase out free allocation in the EU ETS – phasedown free allocation for the covered sectors by 10% per year starting 2026 (50% reduction in free allocation by 2030 and the elimination of free allocation around 2035)

REVENUE USE
- Legal text does not designate how revenue will be used, but introductory text states that “most” revenues will go to the EU budget
EU CBAM: design features based on the EC proposal

EXEMPTIONS

- Countries that have joined the EU ETS: Iceland, Norway, Liechtenstein
- Countries that have linked with EU ETS: Switzerland
- EU territories (e.g., Ceuta)
- Limited exemptions on electricity imports from non-EU countries integrated with the EU’s internal electricity market where technical barriers to CBAM exist (no countries currently listed)
- No special treatment for any other countries, including least developed countries
Legislative process – past steps

**Preparatory work by the Commission**
- Adoption of a communication on the EU Green Deal (2019)
- Impact assessment (March 2020)
- Public consultation (July 2020 to October 2020)

**16 September 2020**
- Commission President Ursula von der Leyen announced a legislative proposal on the CBAM among the key new initiatives for 2021

**5 February 2021**
- Report from the EU Parliament “Towards a WTO-compatible EU carbon border adjustment mechanism” calling for the introduction of CBAM

**10 March 2021**
- Parliament adopted the resolution on a WTO-compatible CBAM

**14 July 2021**
- Proposal of the CBAM by the Commission
- Public feedback open from 15 July until 18 November 2021
A legislative process that is ongoing

In addition, a series of implementing acts and dedicated acts to be set up to specify the operationalisation of the CBAM.
Indicative timeline as proposed

2023-2025

- Transition phase
- Importers will have to report emissions embedded in their goods without paying a financial adjustment

2026-2035

- System is fully operational, with gradual phasing out of free allocation
- EU importers will have to declare annually the quantity of goods and the amount of embedded emissions in the total goods in the preceding year and surrender the corresponding amount of CBAM certificates.
References on ETS vs. tax


• UBA (2019): How can existing national climate policy instruments contribute to ETS development?, Report No. (UBA-FB) FB000039


References on CBAM


• European Commission (EC), Ramboll, DIW, UBA, FAU, ecologic (2021): Study on the possibility to set up a carbon border adjustment mechanism on selected sectors, TAXUD/2020/AO-14.

• Kardish, Christopher, Maosheng Duan, Mary Hellmich, and Maia Hall (2021): Which countries are most exposed to the EU’s proposed carbon tariffs? Berlin: adelphi.

• Kardish, Christopher, Maosheng Duan, Lina Li, Yujie Tao and Mary Hellmich (2021): The EU carbon border adjustment mechanism (CBAM) and China. Unpacking options on policy design, potential responses, and possible impacts. Berlin: adelphi.

• Marcu Andrei, Mehling Michael, Cosbey Aaron (2021): Border Carbon Adjustments in the EU, ERCST.

• Risteska Sonja, Redl Christian, Ecke Julius, Kunert Rita (2022): The EU’s Carbon Border Adjustment Mechanism, Challenges and Opportunities for the Western Balkan Countries, Agora Energiewende and enervis.