Toulouse School of Economics

Can Europe plug its carbon leaks with the CBAM?

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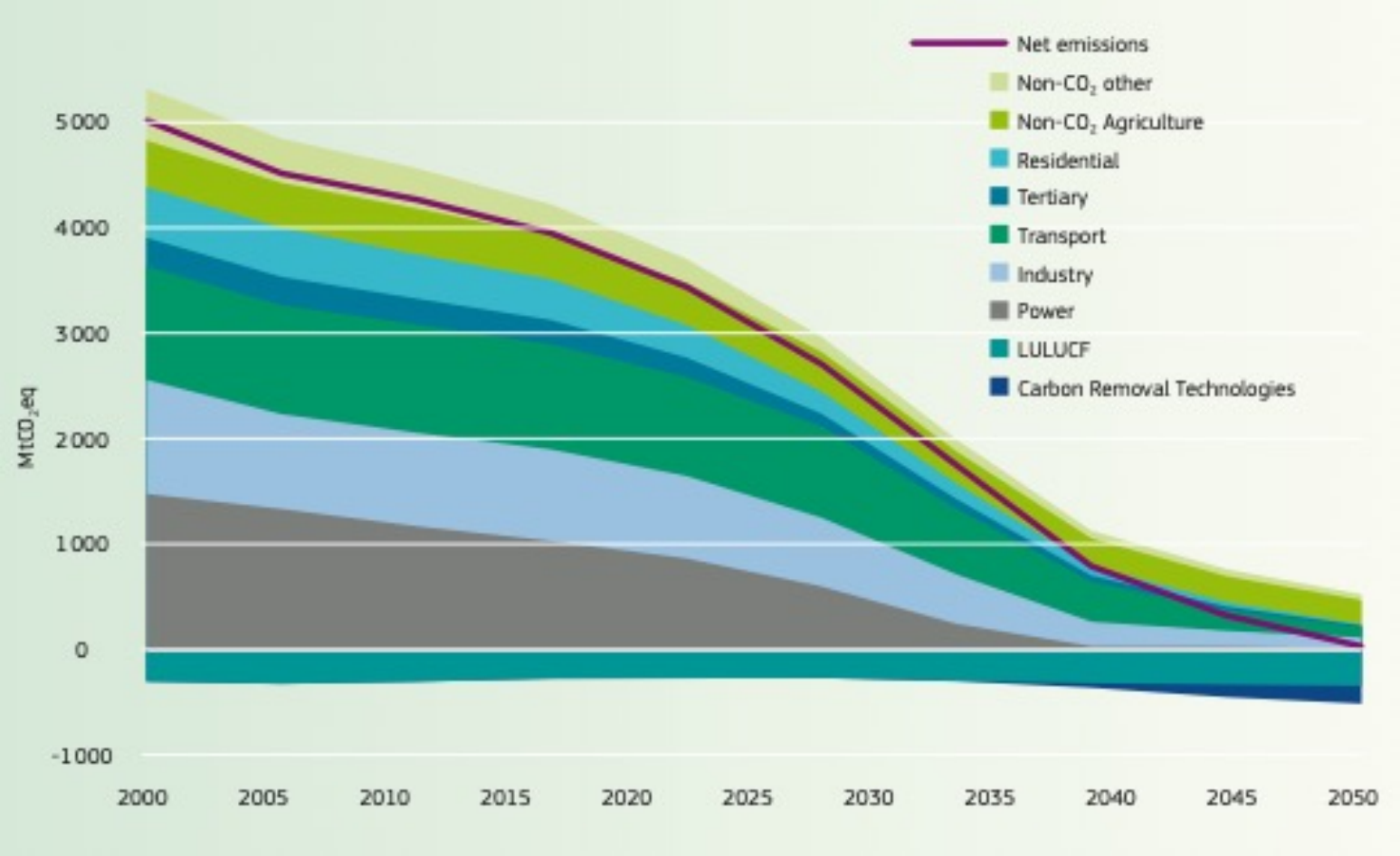
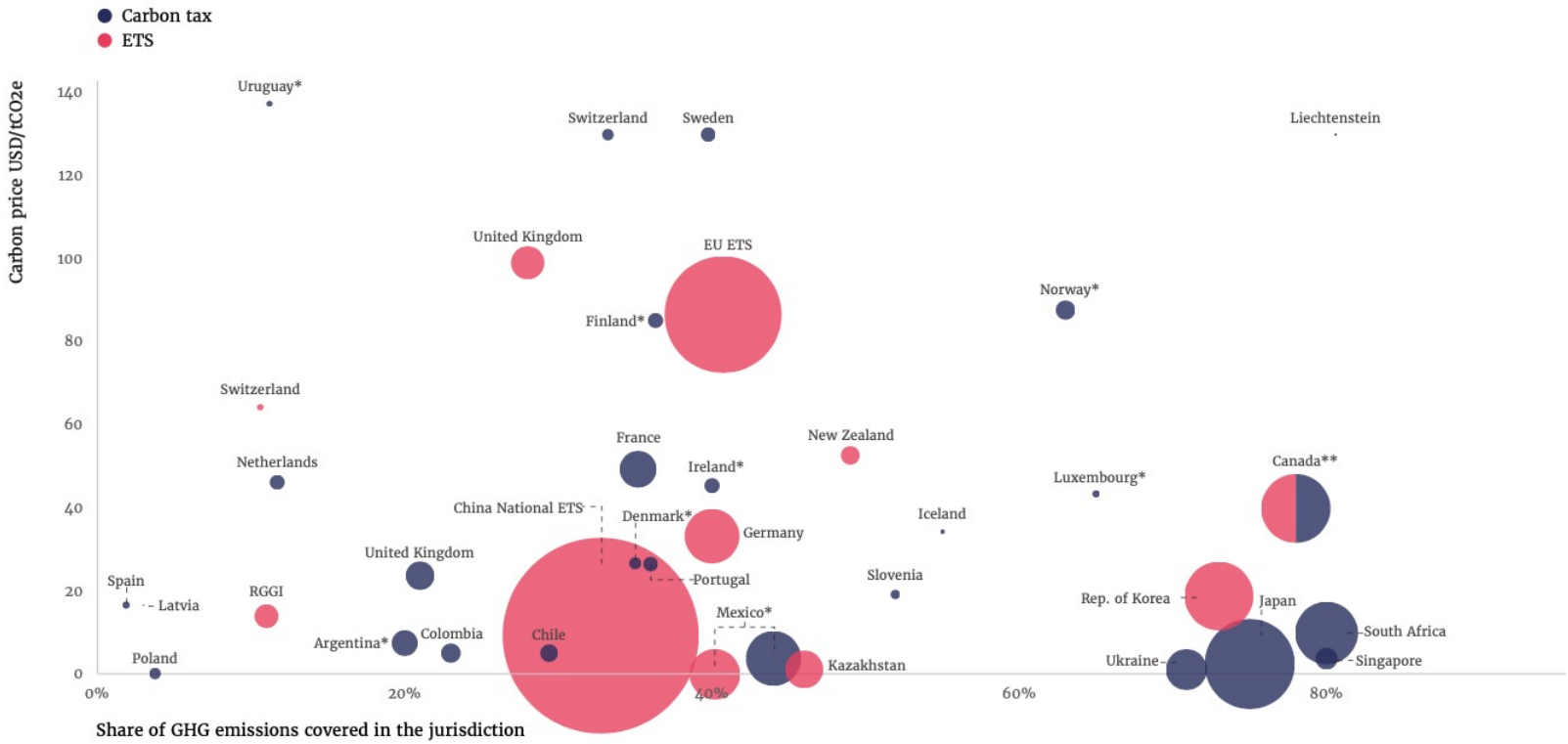
The EU's road map

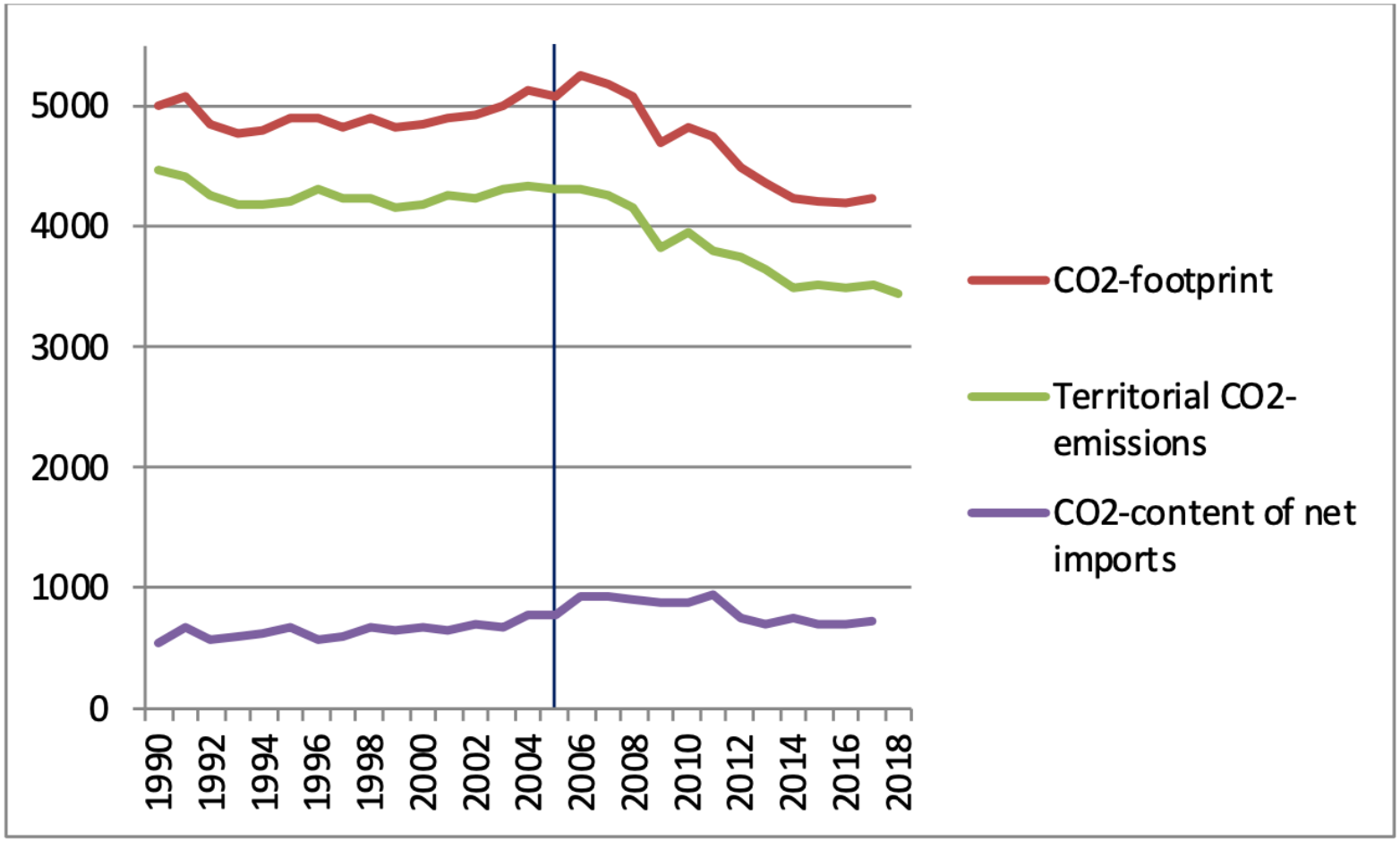


Carbon pricing worldwide



Source: State and trends in carbon pricing 2023, The World Bank

Yearly CO2 emissions in the EU



Source: EU parliament briefing

Carbon emissions leakage

- Cost of unilateral carbon pricing such as EU ETS
- Loss of competitiveness and emissions not capped
- Policy instruments to address leakage:
  - Domestic rebates (subsidies, free allowances)
  - Border charge on imports
  - Border rebates on exports

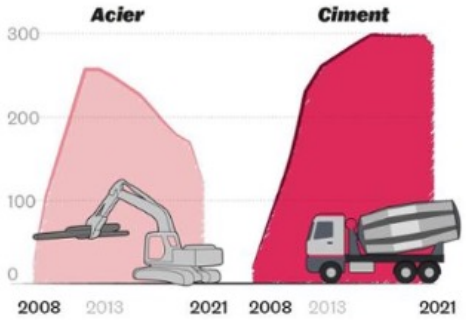
The EU's Carbon Border Adjustment Mechanism (CBAM)

- Targeted sectors: aluminum, cement, electricity, fertilizers, hydrogen and iron & steel
- Emission allowances at the EU ETS price but not from the EU ETS market
- Price differential if carbon price in the country of origin
- Based on emission intensity of products
- Direct and indirect emissions (Scope 2)
- Reported emission intensity (default if not)
- Free allowances phased out progressively over ten years, while the CBAM is phased in

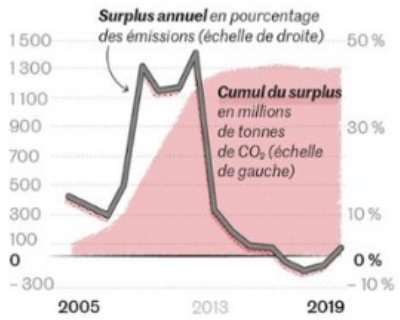
From Le Monde

Les quotas gratuits, une mine d'or pour les industriels

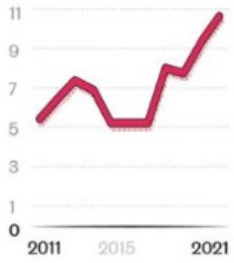
Stocks de quotas cumulés
pour l'acier et le ciment,
en millions de tonnes de CO_2



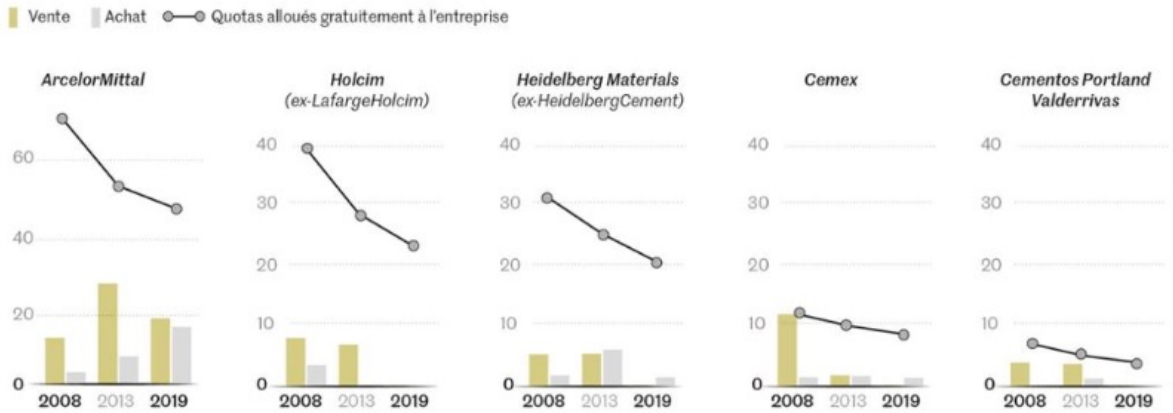
Excédents de quotas
(différence entre les quotas reçus et le CO_2 émis,
tous secteurs industriels,
sauf combustion de carburants)



Volume de quotas échangés sur le marché du carbone
en milliards d'euros



Comparatif entre les ventes et les achats de quotas
en millions de tonnes de CO_2



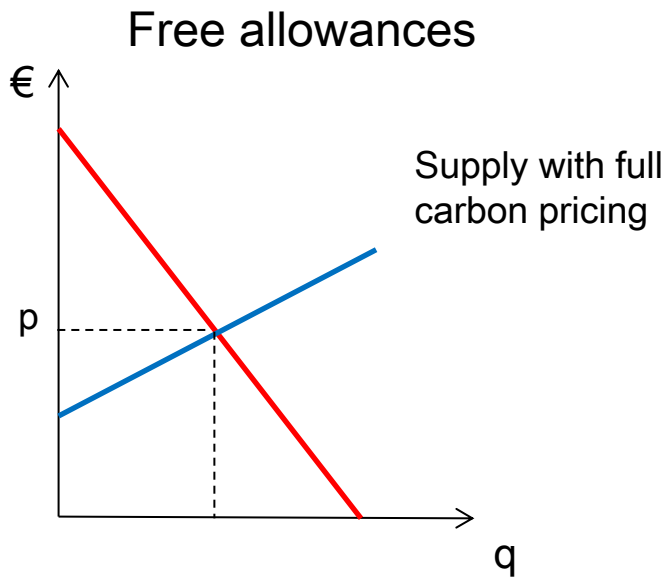
Infographie *Le Monde*
Sources : EUTL ; EUETS.info ; ERCST ; Centre Wegener ; Eurostat ; Prodcom ; EcoAct ; EEA ; ICE ; EEX ; Bloomberg

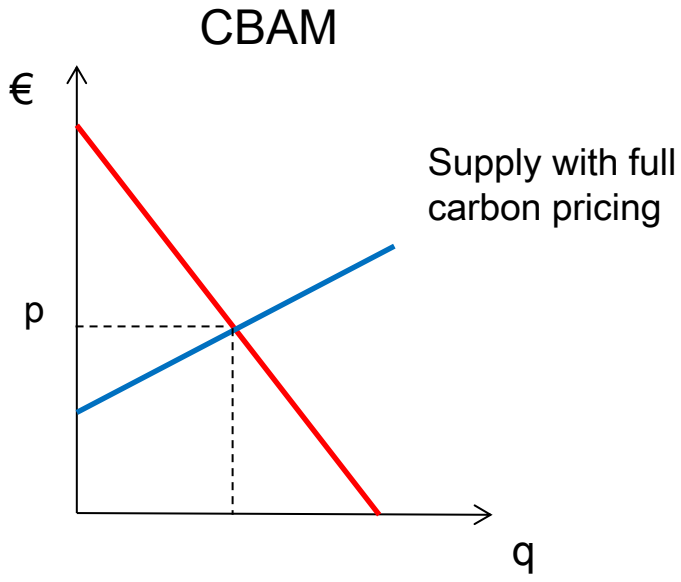
Economic analysis of the CBAM, free allowances, and export rebates

Research question in Ambec S., F. Esposito and A. Pacelli

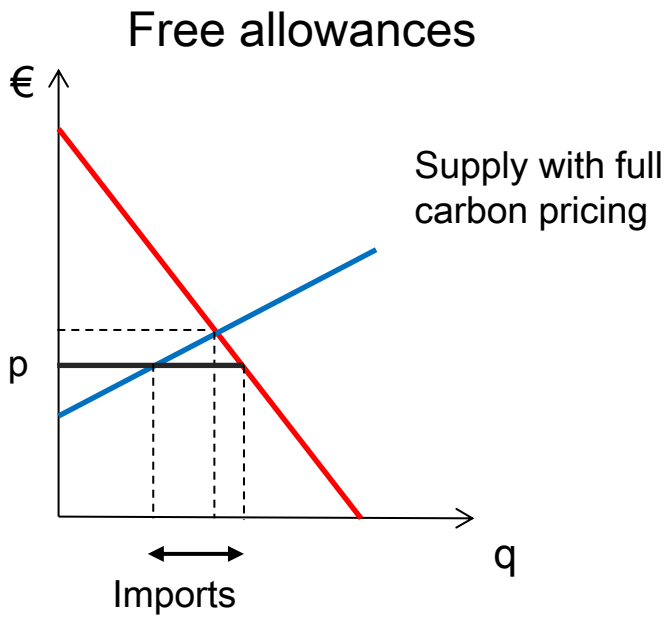
- Equilibrium and welfare impact of carbon-leakage mitigation policies:
  - Free allowances (or output subsidies)
  - CBAM (border charge)
  - Export rebates (or free allowances on exports)

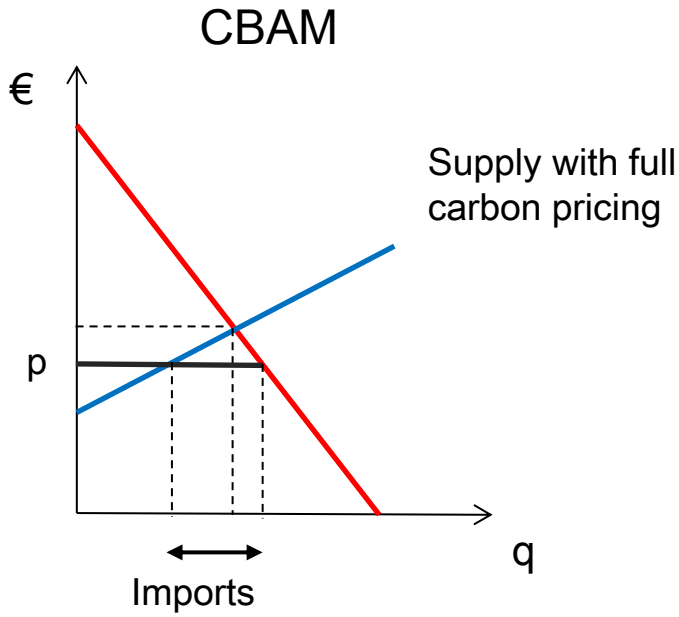
Free allowances versus CBAM



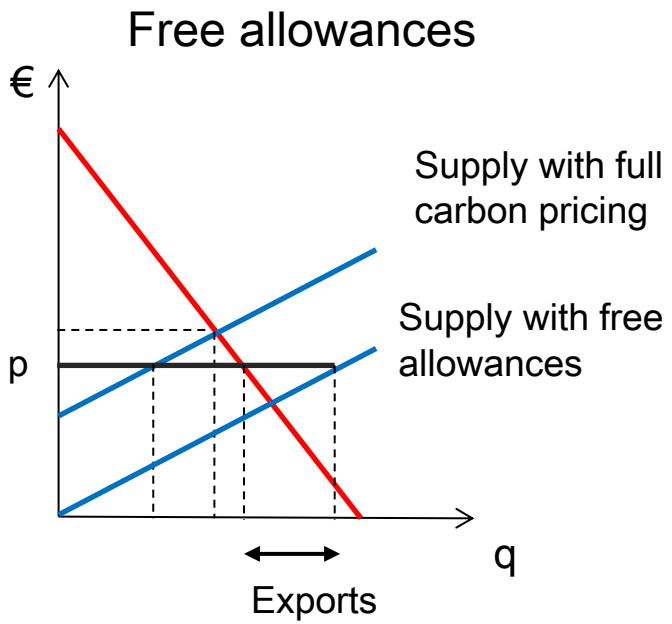


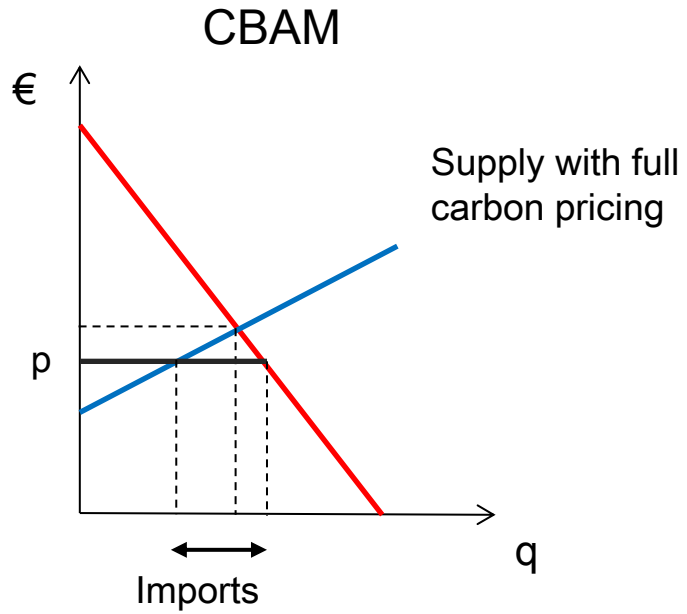
Free allowances versus CBAM



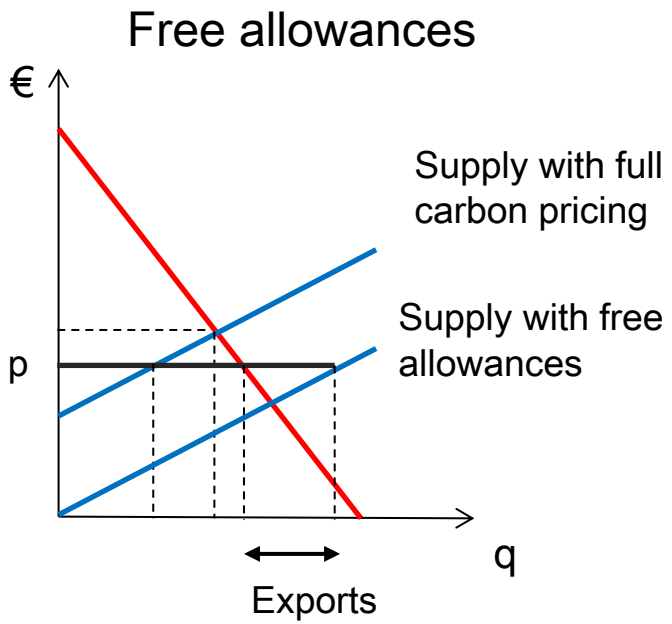


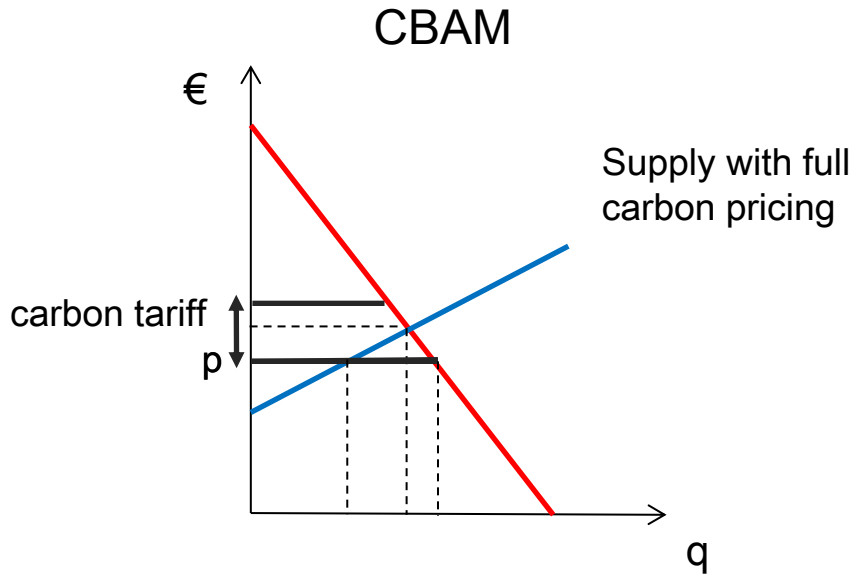
Free allowances versus CBAM



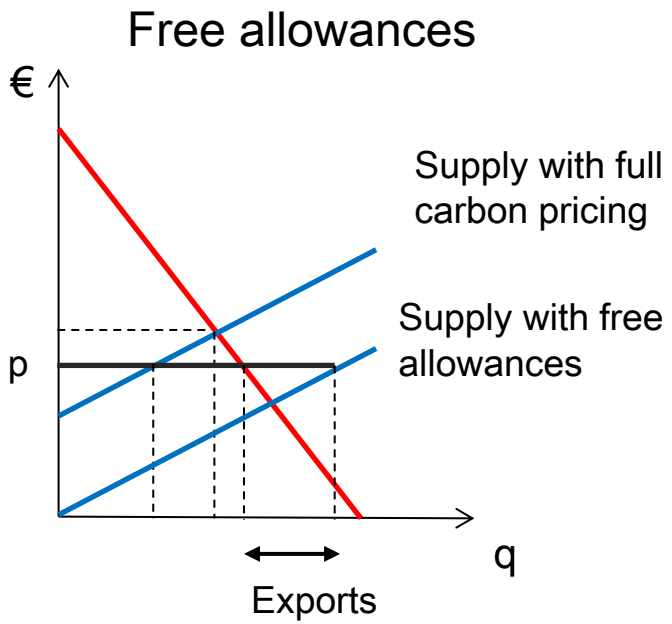


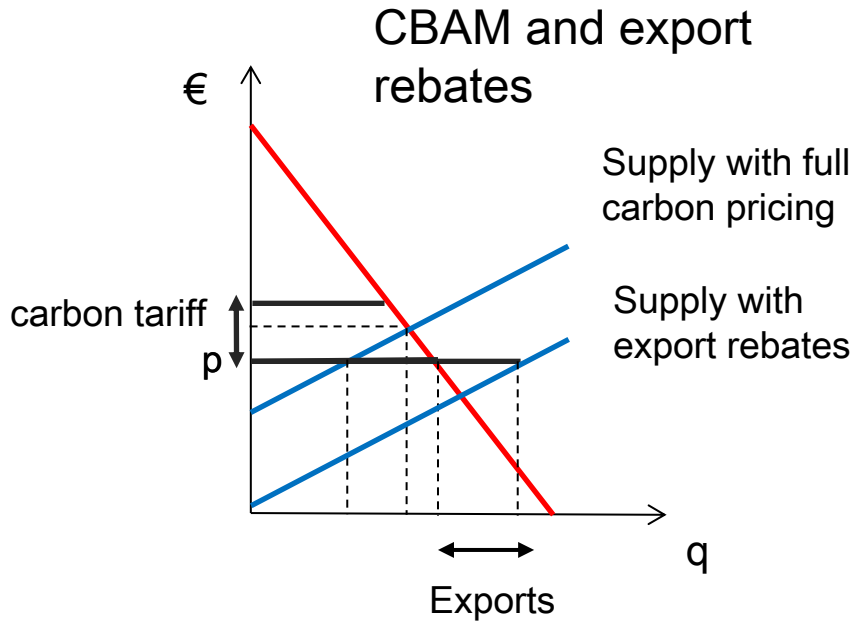
Free allowances versus CBAM





Free allowances versus CBAM

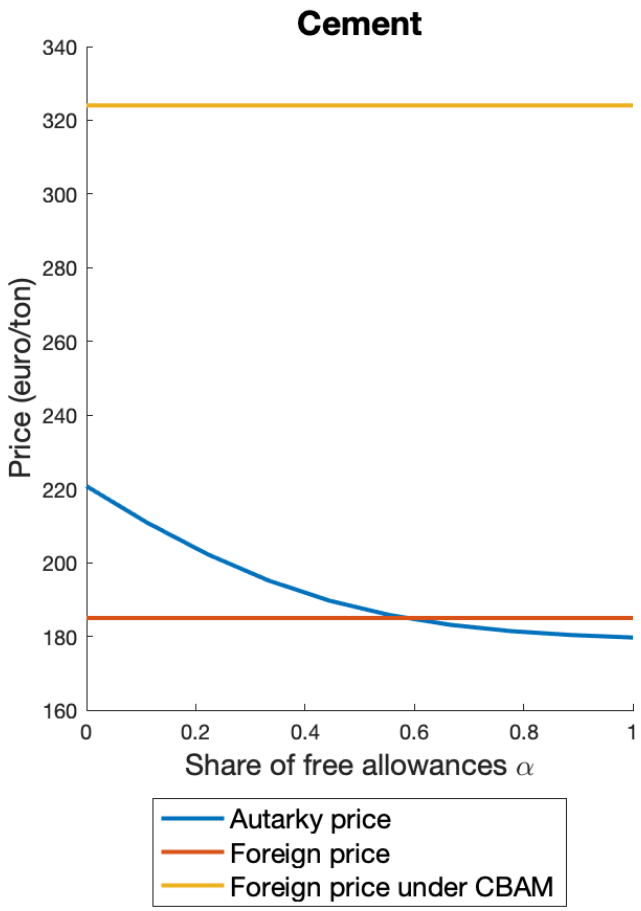


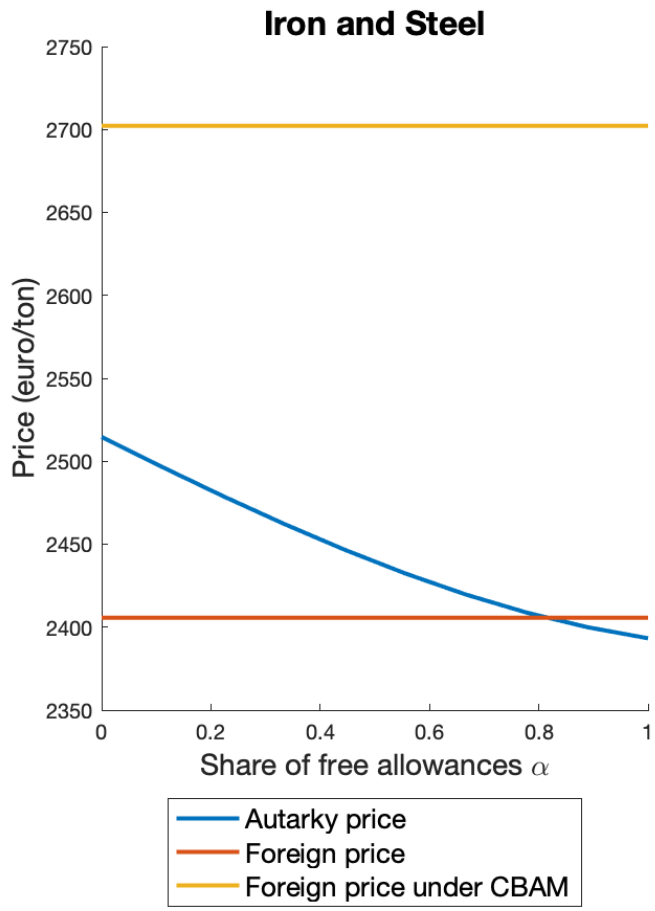


Results in Ambec, Esposito and Pacelli (2024)

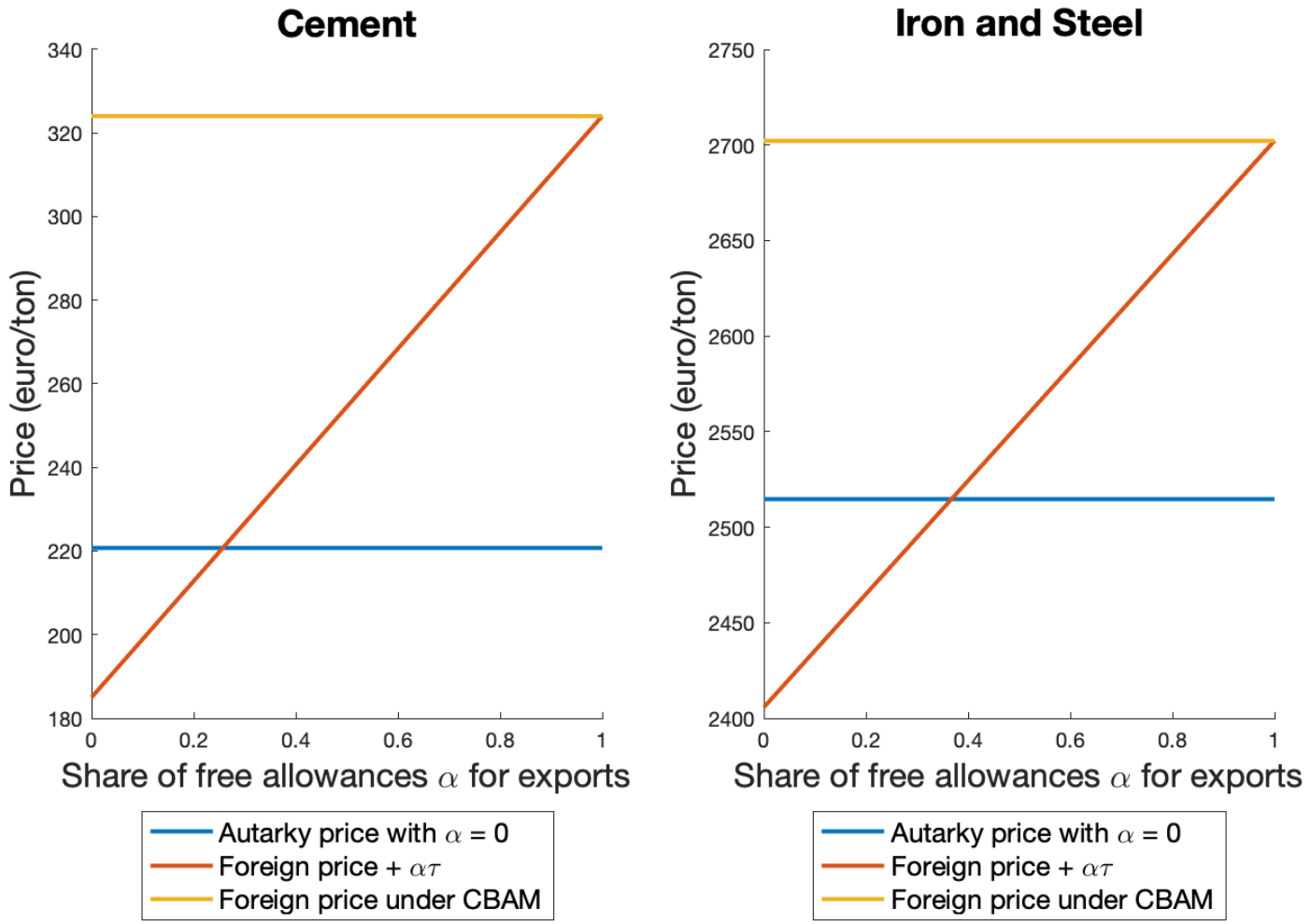
- With only free allowances
  - Autarky price>Foreign price: imports (leakage)
  - Autarky price<Foreign price: exports (reverse leakage)
- With CBAM
  - Autarky price>Foreign price + import charge: imports (leakage)
  - Foreign price+ import charge >Autarky price >Foreign price : no trade (no leakage)
  - Foreign price>Autarky price: exports (reverse leakage)
- With CBAM and export rebates
  - Autarky price>Foreign price + import charge: imports (leakage)
  - Foreign price+ import charge >Autarky price> Foreign price + export rebate : no trade (no leakage)
  - Foreign price+ export rebate > Autarky price: exports (reverse leakage)

Simulations prices with CBAM carbon price 162 €





Simulation prices with CBAM and export rebate carbon price 162 €



Summary of the equilibrium analysis

- Free allowances
  - increases production by subsidizing output
  - levels the playing field within and outside the EU

- CBAM
  - consistent with the polluter-pays principle and Pigouvian taxation
  - levels the playing field only within the EU unless complemented with export rebates
  - reduces trade

Welfare analysis

- Welfare:

Consumer surplus + Profits – Social cost of carbon x Emissions

- The CBAM increases the welfare even if carbon is underpriced and some allowances are free

- The welfare is further increased with export rebates

Issues raised by the CBAM: From theory to practice

Targeting only a subset of sectors

- Aluminum, cement, fertilizers, iron and steel, hydrogen, power targeted in the EU CBAM
- Pros:
  - Administrative feasibility
  - Carbon intensive sectors
  - Upstream industries have lower import tariffs and non-tariff barrier (Shapiro 2021)
- Cons:
  - Leakage with close substitutes
  - Leakage downstream the supply chain

Scope of emissions covered by the CBAM

- Scope 1: direct emissions from manufacturing
- Scope 2: indirect emissions from manufacturing
- Scope 3: indirect emissions along the supply chain
- EU Commission : Scope 1
- EU Parliament: Scope 2
- Administrative simplicity versus leakage by switching from direct to indirect emissions
- Example: outsourcing power generation

Incentives and policy spillovers

- Reporting of emission intensity versus default
  - Incentives to reduces emissions for foreign producers but potential “resource shuffling”
  - Self-selection of less-carbon intensive foreign producers (Cicalla et al. 2022)

- Charge carbon price differential with foreign countries
  - Policy spillovers toward a uniform carbon price
  - Difficult to implement because different rules

  Example: ETS based on emission intensity in China rather nominal emissions like in the EU

What to do with the revenues?

- General budget + decarbonation of industries in less developed countries

- Other options:
  - Transfers to households
  - Investment in low carbon technologies
  - Tax cuts
  - Investment in infrastructures
  - Reduction of public debt
  - Transitional support to the industries

WTO compatibility

- To comply with the ‘most favoured nation treatment’, products should be categorized differently based on their carbon footprint
- Adjusting to national carbon pricing might violates the ‘national treatment’
- Exception for environmental protection might apply

On international trade and the environment

- Inflation Reduction Act (IRA): massive subsidies to low-carbon investment and technologies
- How the US's IRA and the EU's CBAM modify trade and carbon emissions?
- Environmental standard instead border tax
- Environmental provisions in free trade agreements

Thank you!

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References

- Ambec S. “The European Union’s Carbon Border Adjustment Mechanism: Challenges and Perspectives”

  TSE working paper, 2022

- Ambec S., F. Esposito and A. Pacelli “The Economics of Carbon Leakage Mitigation Policies” *Journal of Environmental Economics and Management*, 2024