Tackling Leakage in a World of Unequal Carbon Prices - Addressing a Multilateral Challenge

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16 September 2008

Climate Strategies

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Overview

- Introduction
- Carbon leakage channels and evidence
- Addressing Carbon Leakage

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The EU ETS Directive Proposal Phase III (2012 - 2020)

The Issue

- Preferred long term option: full **auctioning**, **less** certificates
- **Free allocation** during a transitional period (Art 10a) until 2020
- **Postponed** decision for installations in **energy-intensive sectors** exposed to international competition.
- Taking into account **progress in reaching an international agreement** to avoid net carbon leakage
  - **2010**: Commission will determine which sectors are concerned
  - **2011:** in-depth assessment of energy-intensive industries qualifying for free allocation
- The message: **the regional carbon price will increase**

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Impacts of the EU ETS on industrial cost structures

The Issue

- EU ETS Phase I and II: free allocation and windfall profits; Phase III with auctioning
- Effects from carbon pricing: **direct** and **indirect** operation cost increase
- Cost recovery depends on ability to **pass** them **through**
- Pass-through depends on:
  - International/national **competition**
  - Regulation (indirect costs)
  - **Market structures**
  - Abatement costs
  - Share of carbon costs in overall cost structure, elasticities (demand, substitutes)

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Carbon Leakage

The Issue

- Defined as the change in GHG emissions outside the country or region taking domestic mitigation action. The leakage rate relates this change to the reduction in the emissions of the country or region (e.g. Barker et al. 2007)

$$\frac{\Delta \text{ GHG outside EU}}{\Delta \text{ GHG reduction in EU}}$$

- Meaning: 30 percent leakage out of 100 units avoided emissions under the EU ETS would limit the actual contribution of the EU ETS to the **global** emissions reductions to 70 units.

- Climate policy challenge: undermines effectiveness

- Territorial approach to emission accounting (Kyoto)

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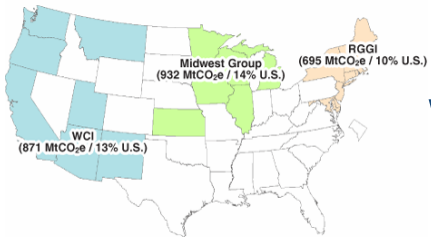

Emission Trading Schemes in Other World Regions

The Issue

- New ETS established by **Australia** and **New Zealand**, starting 2009
- Regional ETS in the **US** (and **Canada**): RGGI, WCI
- **Japan**: debating a switch from voluntary to mandatory ETS
- → **short- to mid-term**: regional carbon pricing prevails
- **Linking** of Schemes: EU and Norway; (International Carbon Action Partnership (ICAP Initiative): EU COM, France, Germany, Greece, Ireland, Italy, NL, Portugal, Spain, UK; WCI members, RGGI members, AUS, Norway

→ **long-term goal:** international carbon trading

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Addressing Carbon Leakage

The Issue

Levelling the different carbon prices among world regions

- **Mid- to Long-term:**
  - Striving for an global allowance market (see ICAP)
  - Striving for a global climate deal on carbon pricing
  - Striving for sectoral agreements

- **Short-term:**
  Cost equalisation for actors contributing to the leakage phenomenon
  - **Within the ETS design: free allocation**
  - **Within or outside the ETS design: subsidies/state aid**
  - **At the border: taxes, allowance rules**

- **What drives decisions? Leakage or competitiveness concerns?**

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Channels and Evidence

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Energy-Intensive Industries (EII)

Channels and Evidence

- Defined as business entities whose purchases of energy products and electricity amounts to **at least 3.0%** of the **production value** or where more than 0.5% of value added is spend on energy taxes. (Art 17, Council Directive 2003/96/EC, 27 October 2003, Community framework for the taxation of energy products and electricity)

- **Other** definitions possible (e.g. Value added per energy unit below a certain treshold)

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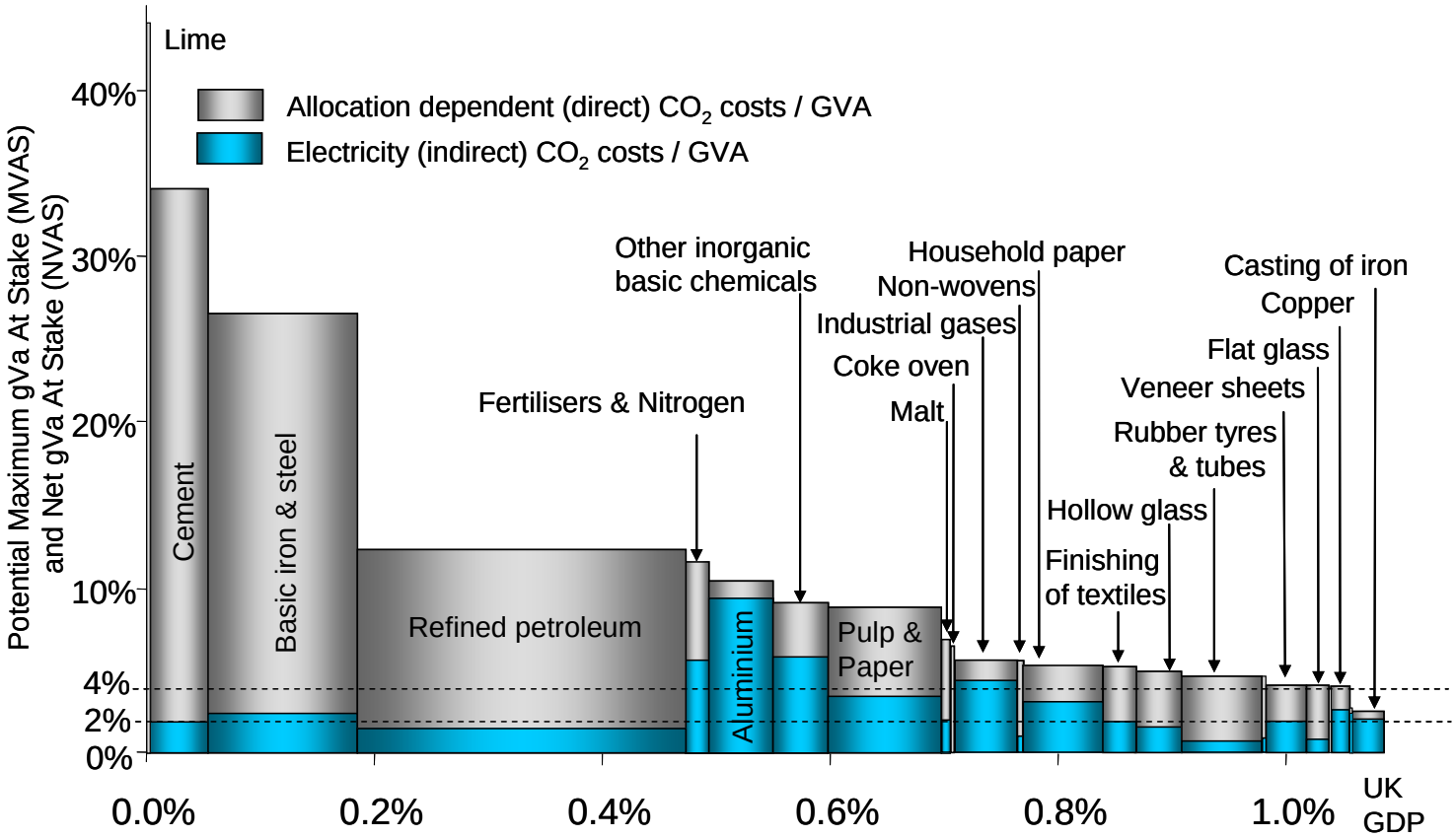
Cost screen: Sectors potentially exposed to unilateral CO_2 pricing (€20 t/CO2) - UK

Channels and Evidence



Price increase assumption: CO_2 = €20/t CO_2; Electricity = €10/MWh

Source: Hourcade Demailly, Neuhoff and Sato:
Differentiation and dynamics of EU ETS industrial competitiveness impacts. 2007. Data: 2004

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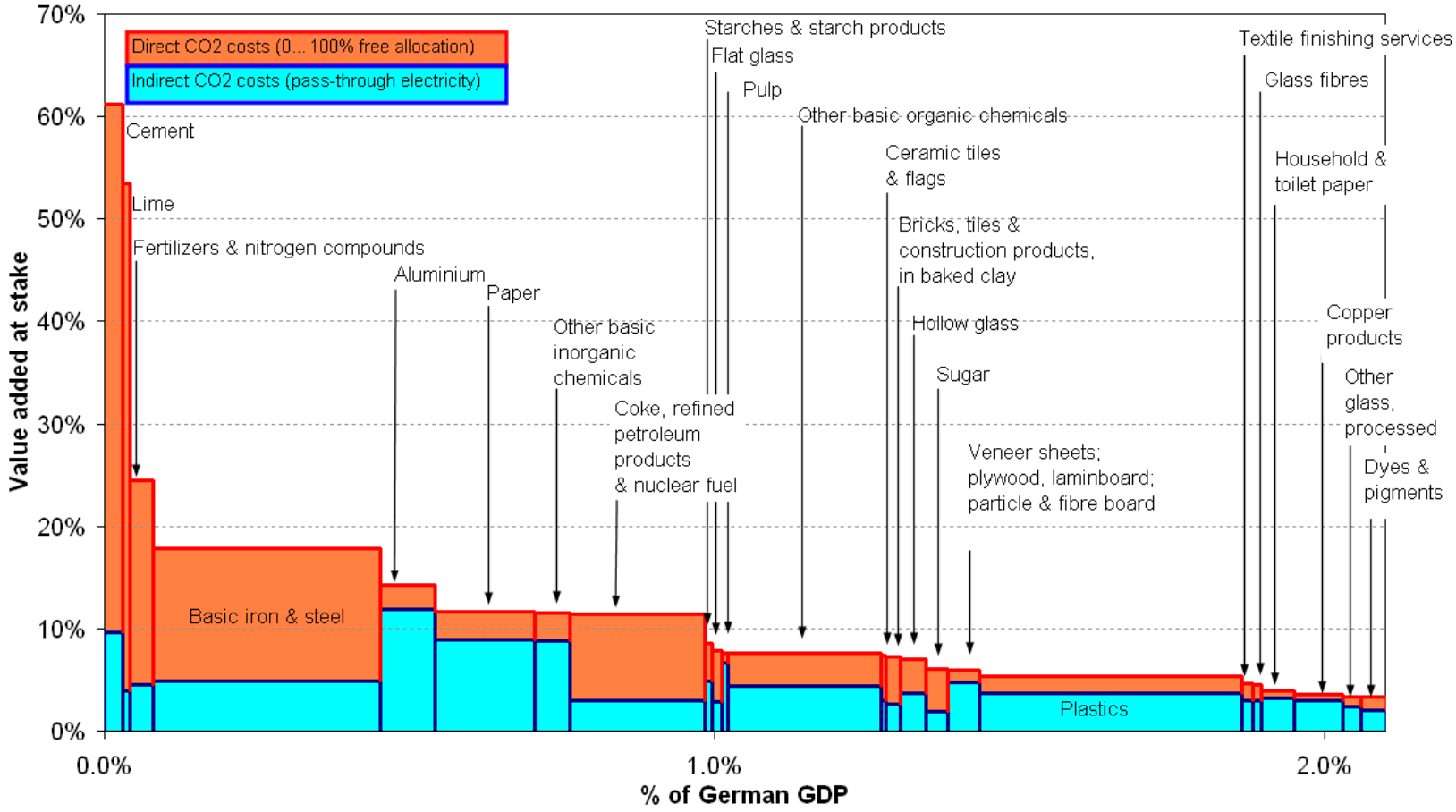
Cost screen: Sectors potentially exposed to unilateral CO2 pricing (€20 t/CO2) - Germany

Channels and Evidence



Source: Graichen et al. 2008, Data Base: 2005

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From Competitiveness to Carbon Leakage

- Competitiveness effects determined by **profits** and **market shares** of producers
- Translate into **investment and production** decisions under carbon pricing

Leakage determined by:

→ (A) **Relocation** potential of carbon-intensive producers

→ (B) **Substitution** of production through imports

→ (C) **International markets**, mainly energy markets, depending on substitution elasticities → feedback loops

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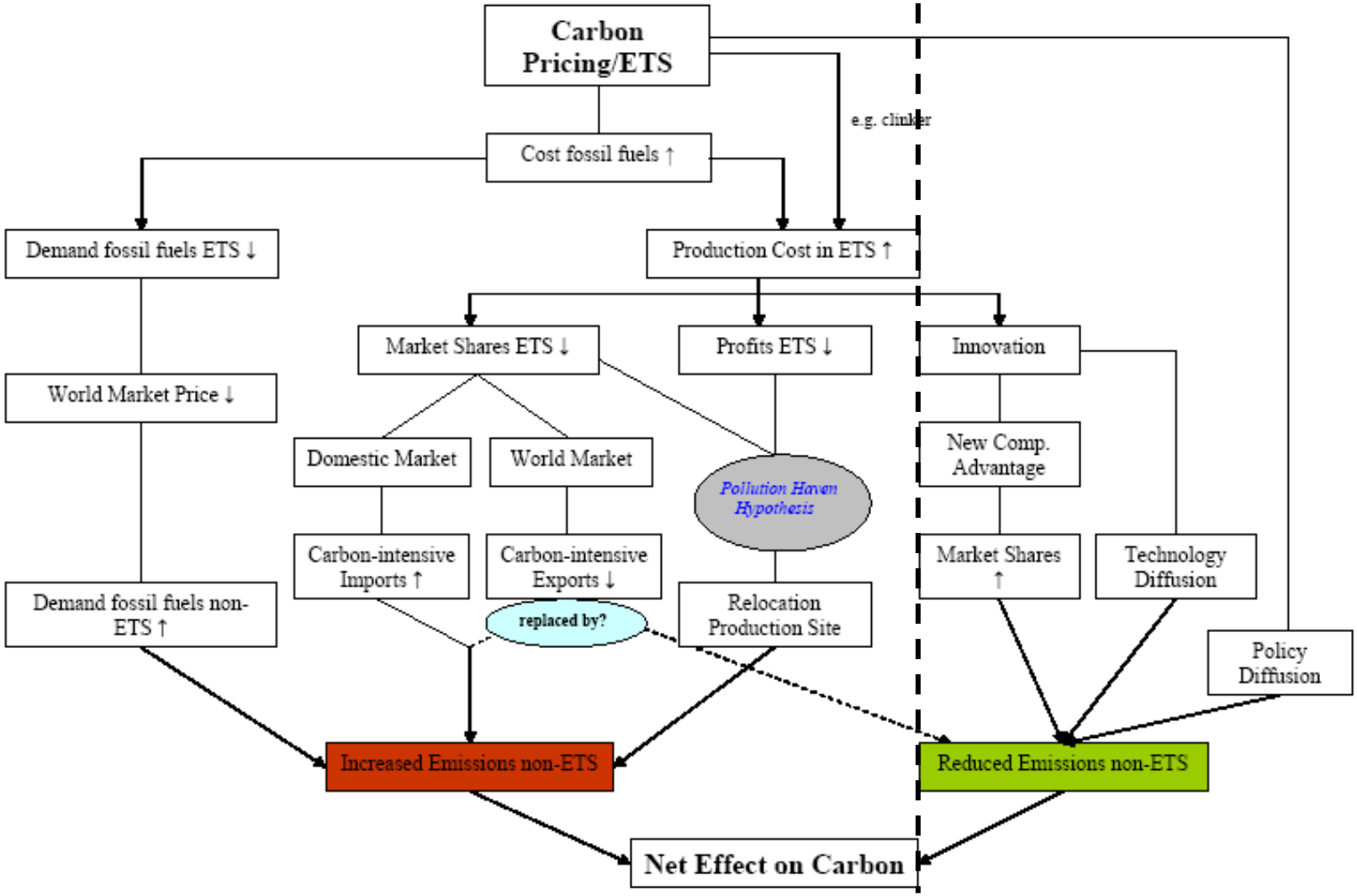
The Leakage Maze:
Potential Effects from Unilateral Carbon Pricing



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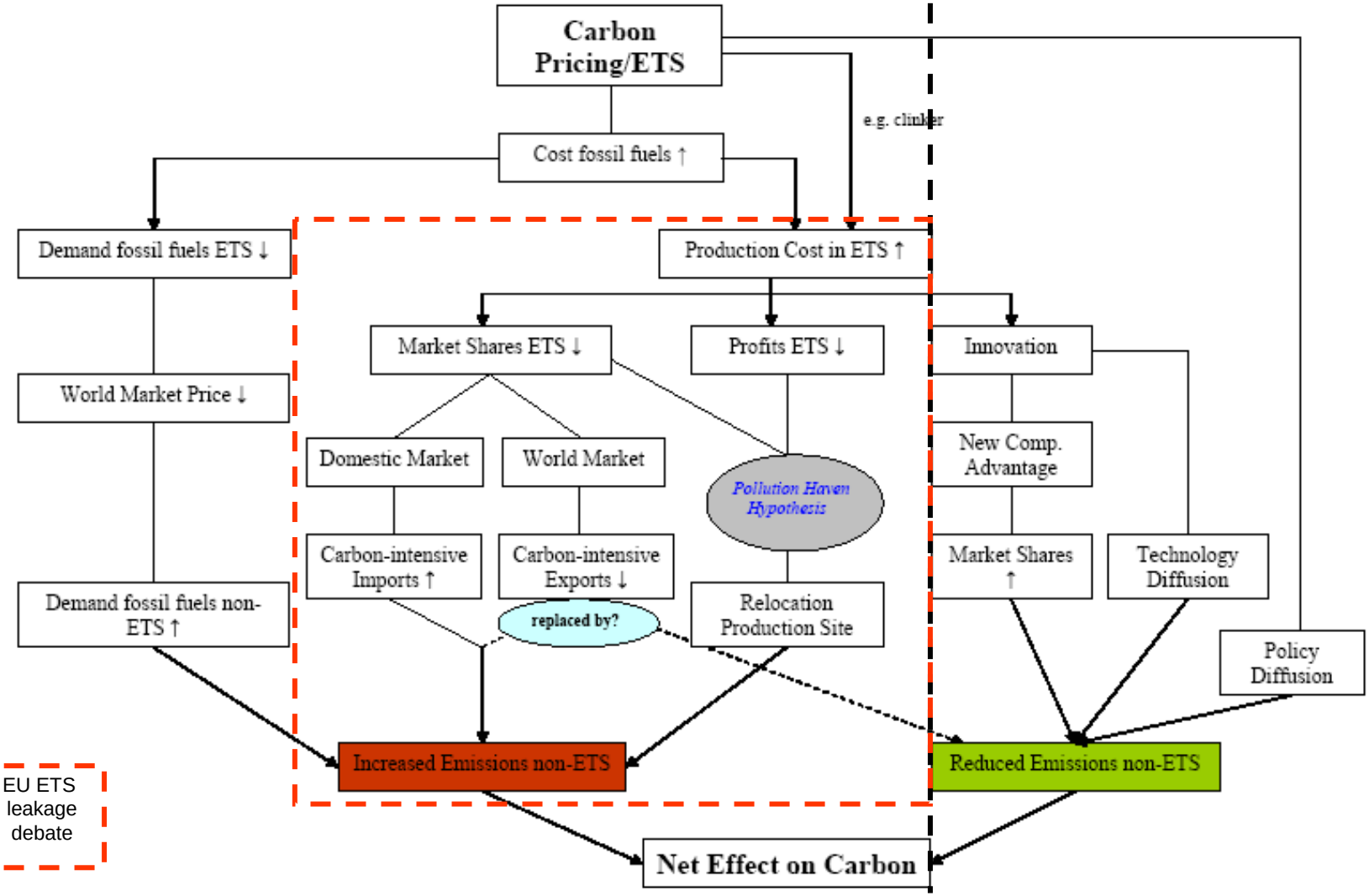

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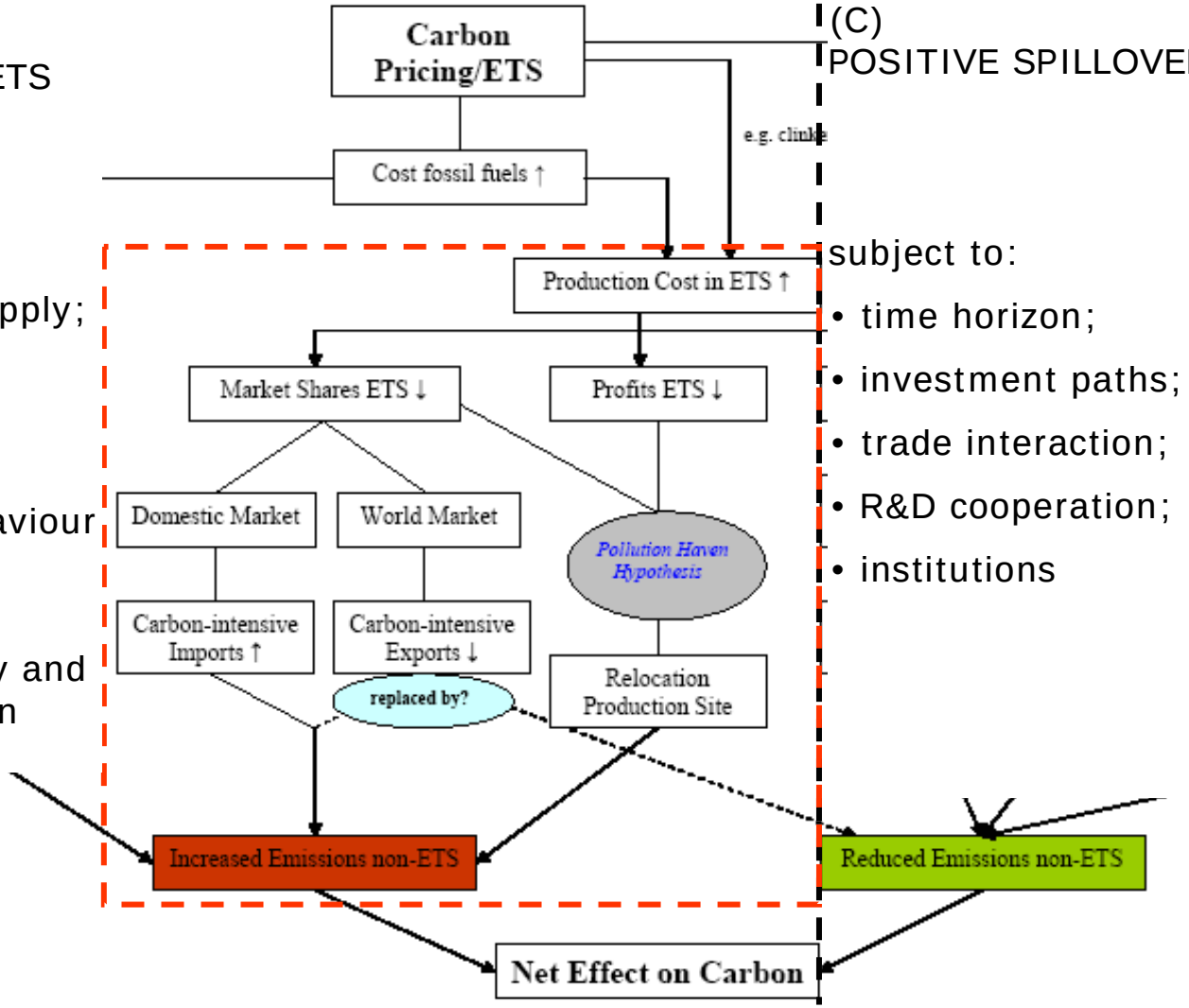
The Leakage Maze:
Potential Effects from Unilateral Carbon Pricing

(C)
ENERGY MARKETS

subject to:

- elasticity of demand and supply;
- inter-fuel substitution elasticity;
- strategic behaviour of OPEC;
- substitution between energy and other production factors



(C)
POSITIVE SPILLOVERS

subject to:

- time horizon;
- investment paths;
- trade interaction;
- R&D cooperation;
- institutions

EU ETS leakage debate

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The Leakage Maze:
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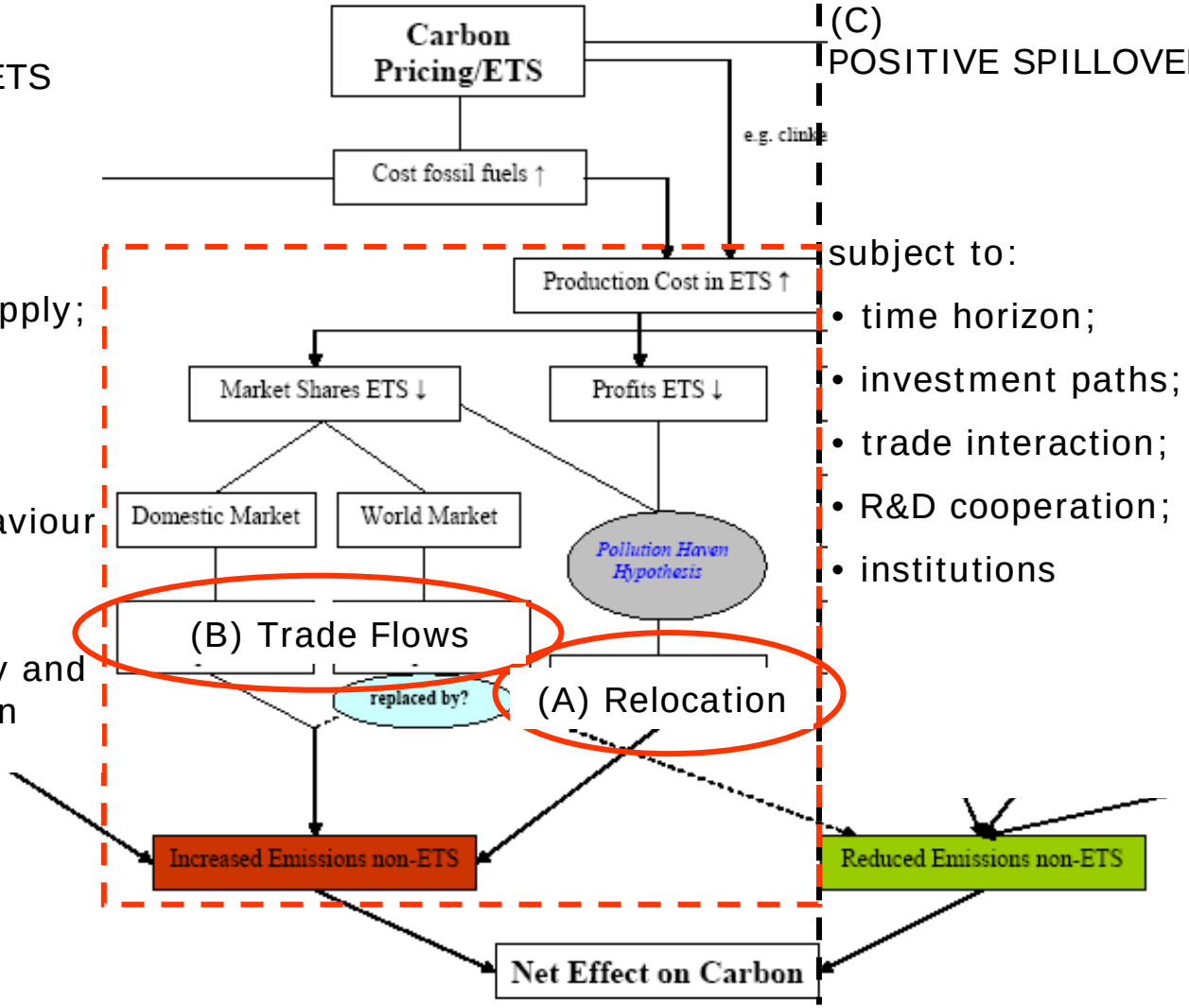

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EU ETS leakage debate

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Quantification of Investment Relocation

Channels and Evidence

- Switch **capital investment** from within to outside Europe
- Relevant **now**, depending on **expectations** of *significant sustained differential* in regional carbon prices ('Invest abroad for import to EU' might not pay if carbon price equalises)
- Few new *greenfield* investment in EU manufacturing, bigger issue is upgrading investment
- But: **set** of factors drive location decisions
- Information needed: carbon pricing impact on fixed and variable costs in an industry; expectation of investors.

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Quantification of Production Leakage

Channels and Evidence

- Decision to reduce output from facility within the EU, and **replace it by imports**
- Relevant for Phase III design decisions (now!)
- Contingent upon adequate capacity and infrastructure to facilitate imports
- Risk? Confined to impact on customer networks in the industries
- Information needed: impact of carbon prices on different levels of the value chain

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Analyses of EEI under the EU ETS

Channels and Evidence

- IEA: output growth in heavy industry 1981 – 2005 took place outside Europe
- *Simulations on Cement: 40 – 70% at 20€/t Co2;
  *Simulations on Iron and Steel: 0.5 – 25% at 20€t/Co2
- **Aluminium**: affected through electricity prices, given long-term contracts with power suppliers and booming demand during the last years – forecast of Co2 pricing difficult

- *Sources: Gielen et al 2000, Demailly et al 2006, 2008, Ponssard et al 2008, Reinaud 2008; Reinaud&Quirion (forthcomin), Walker&Quirion (forthcoming).

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Finding Criteria for Leakage from the EU ETS

Channels and Evidence

- **energy-intensive industries definition**
  business entities whose purchases of energy products and electricity amounts to at least 3.0% of the production value or where more than 0.5% of value added is spend on energy taxes. (Art 17, Council Directive 2003/96/EC, 27 October 2003, Community framework for the taxation of energy products and electricity)

- Other definitions possible (e.g. Value added per energy unit below a certain treshold)

- **Leakage potential** could be related to:
  - **Cost impacts** from carbon pricing
  - **Trade intensities** of sectors and sub-sectors

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Identification of Sectors „significantly at risk“ (Art 10a, 10b)

Channels and Evidence

- How big is ‘significant’?
- Do criteria apply only at EU aggregate level and conditions, or for different EU member countries? Different dependencies (e.g. power sources)? Different facilities (e.g. geographical location) ?
- At what carbon prices?
  - at €20/tCO2, list confined to top 2-4 sectors, but might expand rapidly at much higher carbon prices

→ **difficult and contentious task, prone to political judgements on definitions and boundaries**

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Addressing Carbon Leakage

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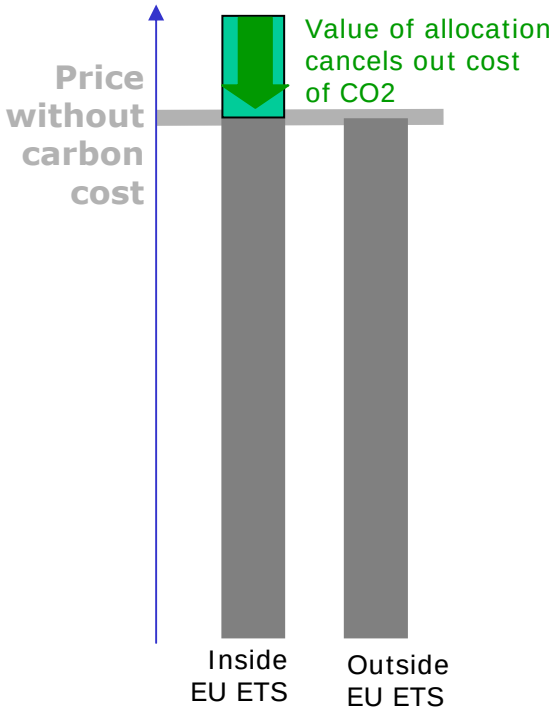
Options for Tackling Leakage

No mechanism (fixed free allocation)

Levelise at non-carbon costs

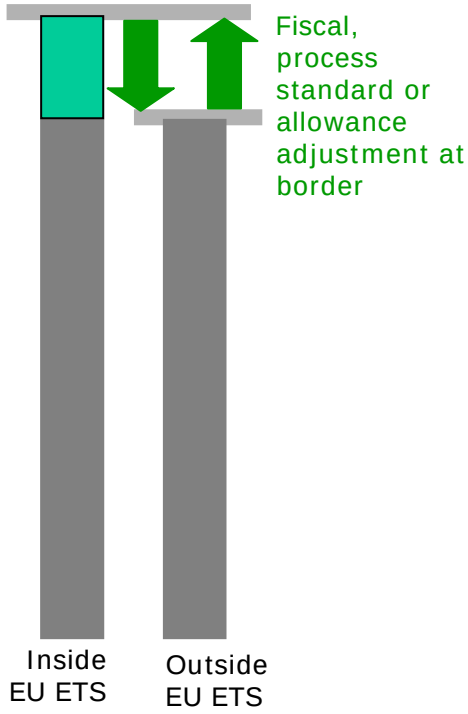
Conditional allocation/ revenue recycling



- Little substitution to low carbon products/services
- Distorts investment
- May constrain innovation
- Risk of lock-in

Support consistent differential

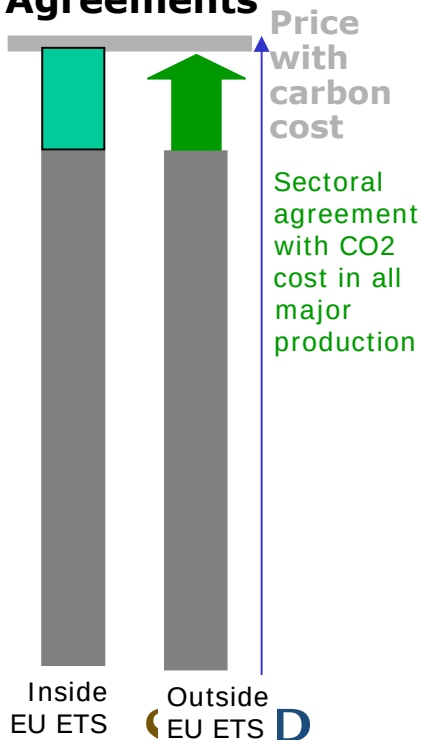
Border adjustments



- Potential problems with WTO/trade relations
- Requires at least informal international cooperation

Globalise carbon costs

Full-cost sectoral Agreements

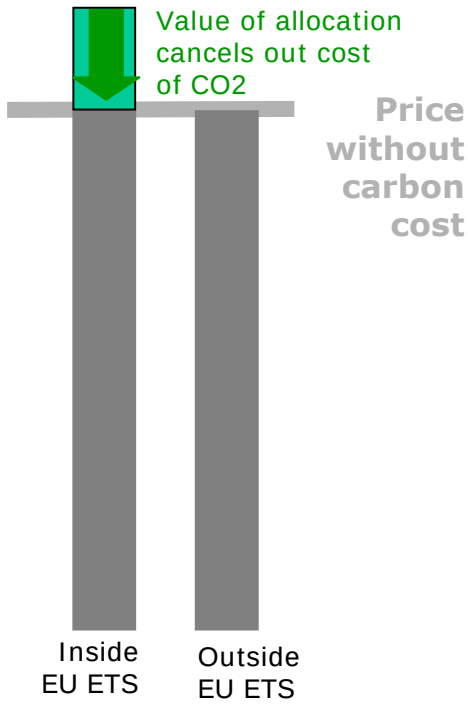


- Requires strong policies of developing countries
- Risk of CO2 price set by lowest common denominator

Free Allocation and State Aid: Level the Carbon Price Downwards

Addressing Carbon Leakage

Levelise at
non-carbon costs
Conditional allocation/ revenue recycling



Critical Issues

- Little substitution to low carbon products/services
- Distorts investment
- May constrain innovation
- Risk of lock-in

→ free allocation or revenue recycling can prevent leakage only if conditional on the activity that the system is trying to deter

→ … third best

!

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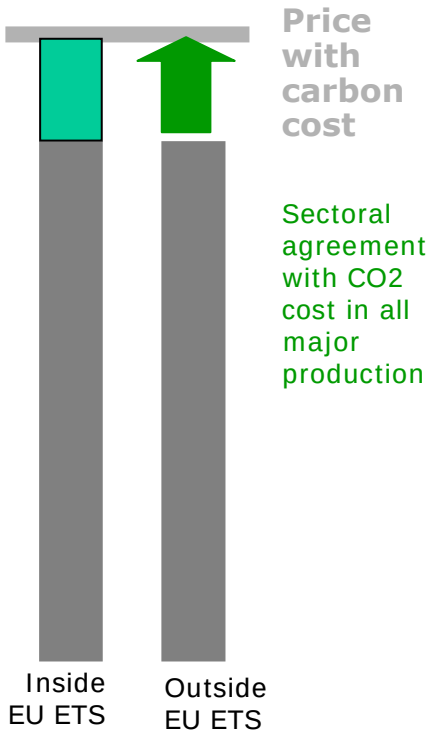
Sectoral Agreements: Level the Carbon Price Upwards

Globalise carbon costs
Full-cost sectoral agreements



Critical Issues

- Requires strong policies of developing countries
- Risk of lowest common denominator
- Not credible for most governments to make, implement and enforce such long-term binding commitment

→ ... first best

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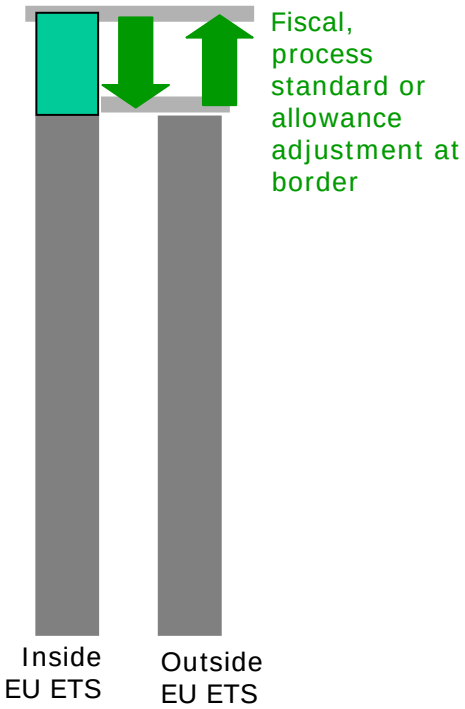
Border Adjustments: Level the Carbon Price Flexibly

Addressing Carbon Leakage

Support consistent differential **Border adjustments**



Critical Issues

- Potential problems with WTO
- Perceived as a threat in international trade negotiations
- Requires at least informal international cooperation if not multilateral agreement
- Common technological standards needed

→ … second best

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Cost Adjustment Measures for Trade Exposed EEI

Addressing Carbon Leakage

Policy Instrument	Trade Policy Aspects	Climate Policy Aspects
I: Taxes/Tariffs		
On carbon-intensive imports	Levelling of carbon costs vis-a-vis third parties Similar to VAT destination principle; Revenues remain with importer	A stick for engaging free riders (?)
Rebates for carbon-taxed exports		No carbon price effect for consumers abroad
Export taxes	Levelling, Revenues remain with exporter	Way to address financial needs of major exporters from emerging and developing countries
II: Allowances		
Importers to the ETS need to buy and surrender allowances	Mandatory rule, extraterritorial application of national/regional climate policy	Which allowances are eligible? International offsets, Allowances from other ETS?
Exporters from EU ETS are exempt from surrendering allowances		Relates to free allocation (III)
III: Other Cost Adjustments for Exports		
Exporters receive reimbursement for allowances	Subsidy?	Revenue recycling at national/regional level
Free allocation for trade-exposed exporters	No trade distortion (?)	Undermines incentives for internalisation of carbon costs

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Border (Tax) Adjustments: Technicalities and Important Ingredients

- Technicalities:
  - **Where to apply border adjustment:** products, benchmarks, how far down in the production chain?
  - **Level of adjustment:** Who determines it, symmetric / asymmetric, also electricity price increases?
  - **Compensation** financial / physical terms: Tax or certificates
  - Compensation of **trade** with every other country, Non Annex 1 countries, countries with/out climate policy?

- Important Ingredients:
  - Focus on **specific sector characteristics**, not generalised protection of a 'carbon pricing' zone
  - **Recognise** the debate in other regions – notably the US
  - Pursue in a **multilateral** setting, not a unilateral protection of EU (or US, other) industry: link to sectoral negotiations
  - Engage the **trade community** from the outset and not burden the WTO

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The EU ETS after 2012

- **Current** debate: **downward** adjustments
  - Grandfathering
  - Revenue recycling
  - Output-based allocation

- In the light of international negotiations: **upward and flexible adjustments**?
  - sectoral agreements on cement, steel, others?
  - Agreement on limiting the use of border adjustments?

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Portfolio of Measures Needed (?)

- What **type** of leakage (production, investment)? Combine tools?
- **Synergies** with competitiveness concerns?
- Prepare for **international** agreements (keep it flexible)

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Many thanks for your attention

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