Allocating emission allowances:
some lessons from the EU ETS experience

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Outline

- From ‘Allocation Doesn’t matter..’
- Outline evolution:
  - Phase I: focus on market design and allocation sovereignty
  - Phase II: the cap, the cap: and a bit of auctioning ..
  - Phase III: over to you, Commission ….
- The fundamental allocation issues:
  - Comparative *vs* collective politics of allocation
  - ‘Windfall’ profits
  - Efficiency and perverse incentives
- Other power, leakage and benchmarks
- .. to Core Conclusions: allocation, allocation ..

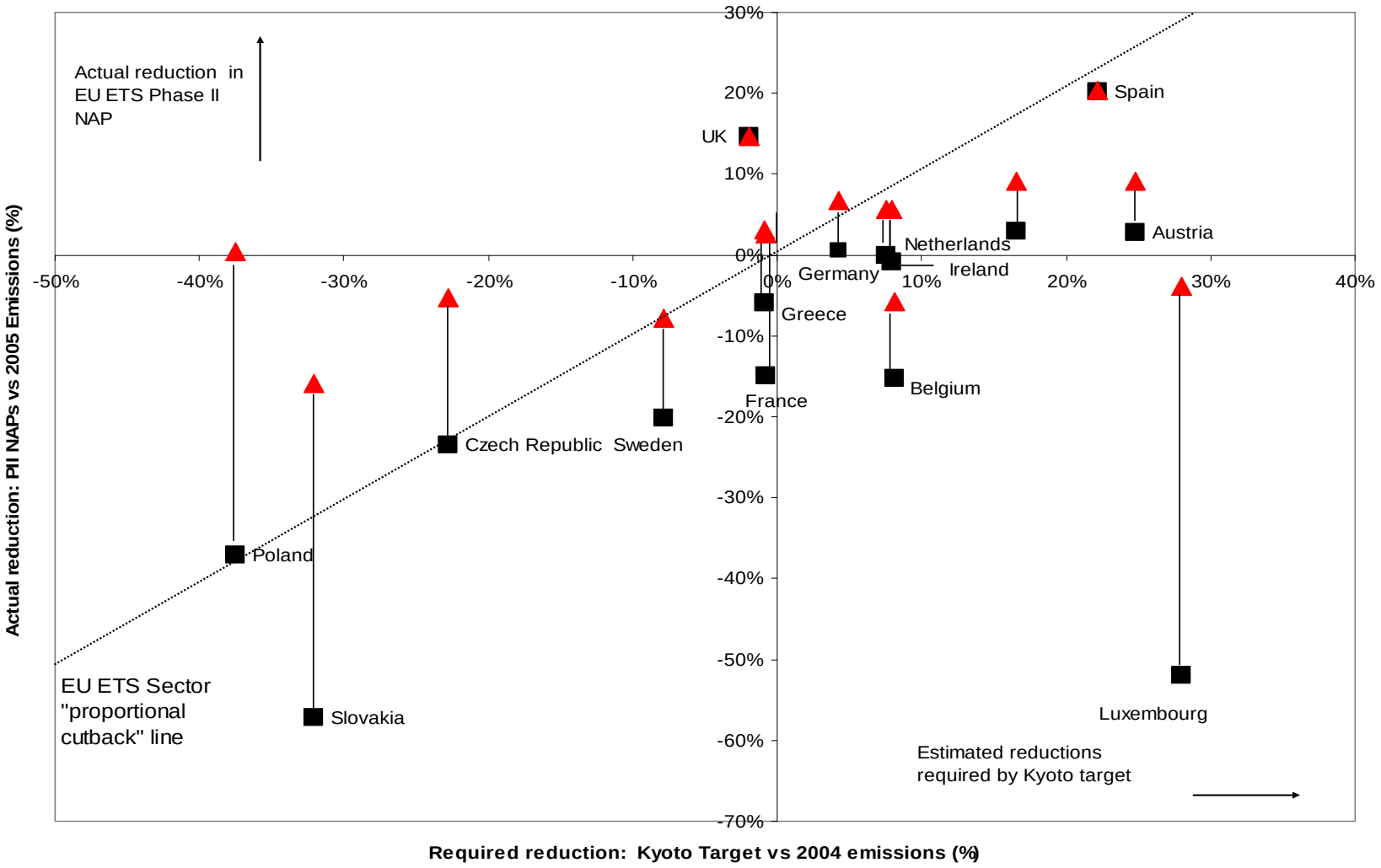
Thumbnail sketch of EU ETS cap-setting evolution

Phase I: broad success in market design and verification, important lessons on profits and allocation

- Unambiguous data revealed large windfall profits to power companies
- Disputes continue over the reasons for the surplus in 2005 – and why people were so surprised
- .. but it is some combination of overallocation and greater than predicted abatement (eg. in cement sector)
  - 2005 Surplus was 5%
  - Abatement represented … how much .. 25-75% of this ?
  - Some found where not expected (eg. lignite, cement …)
- Power sector support for ETS helps to secure its future

Phase II: Commission intervention cut more than 10% from Member State proposals

based on Kyoto consistency & anti-subsidy provisions



Phase II: the cap, the cap - and a bit of auctioning ..

- Threat of a ‘race to the bottom’ as Member States faced intense lobbying pressures
- Defining struggle as the Commission wielded the big stick, in context of:
  - Phase 1 collapse
  - Kyoto targets
  - German EU and G8 Presidencies
- *Three major consequences:*
  - Significant centralisation of cap-setting powers
  - Allocation battles exposed
  - Stronger Parliamentary involvement and first auctioning in the major powers
- Still very low auctioning and little use of benchmarking

Fundamental issues in allocation

- Comparative *vs* collective politics of allocation
- **Costs and 'Windfall' profits**
- Efficiency and perverse incentives

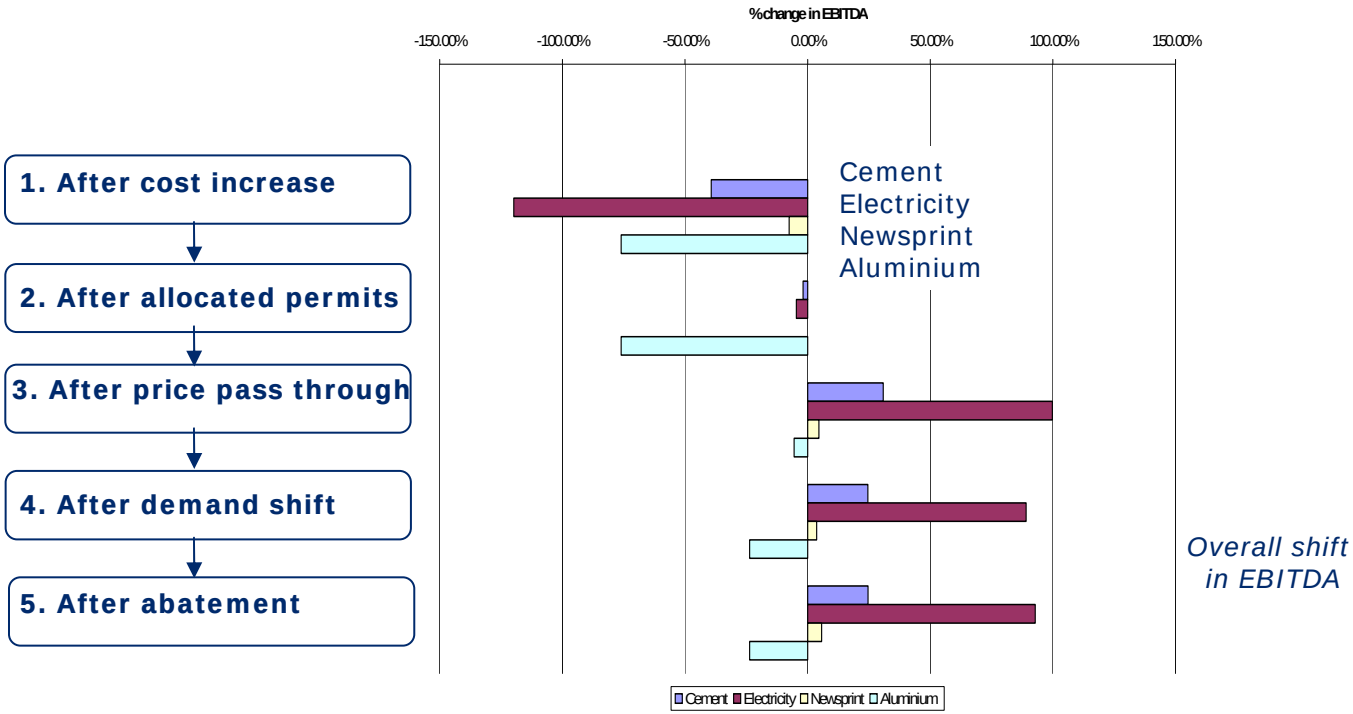
‘Windfall’ profits:
Impact of CO2 prices on electricity prices

- **In countries with liberalised markets and competition:**
  - Empirical evidence confirms that generators add opportunity costs
  - CO2 price of 20Euro/tCO2 increases electricity price by 10-16 Euro/MWh
- This is neither an aberration nor unfair - it is a natural consequence of efficient pricing in a competitive market
- **In countries *without* competitive retail prices:**
  - Regulation or threat of regulation can prevent pass through of opportunity costs to domestic consumers
  - If governments intervene to prevent pass through to industrial contracts, then transparency/liberalisation further reduced
  - Likely to undermine incentive structure of ETS towards efficient investment and operation as CO2 prices are not internalised

The phenomenon *is not confined to power generators, though each sector has specific characteristics*

Depends on allocation & cost pass-through, varies by sector

Sequential shift in profit (EBITDA) through key influences on sector profitability, %



Modeling Basis

- Cournot model (standard oligopoly assumptions)
- EU ETS has an impact on both marginal and fixed costs of EU companies
- Extent of cost pass through determined endogenously
- Demand adjustment determined by elasticities taken from academic journals
- Marginal Abatement Cost Curves taken from previous ENTEC work

The money matters – *who gets the rents?*

- Power sector profits from EU ETS €5bn+ during 2005
- Likely aggregate Phase II profits €5-10bn/yr @ €20/tCO2
- UK & Germany raising €100ms from auctions in Phase II
- International and sectoral investment linkages emerging through the CDM

The extent to which carbon costs feed through into product prices determine the next impact

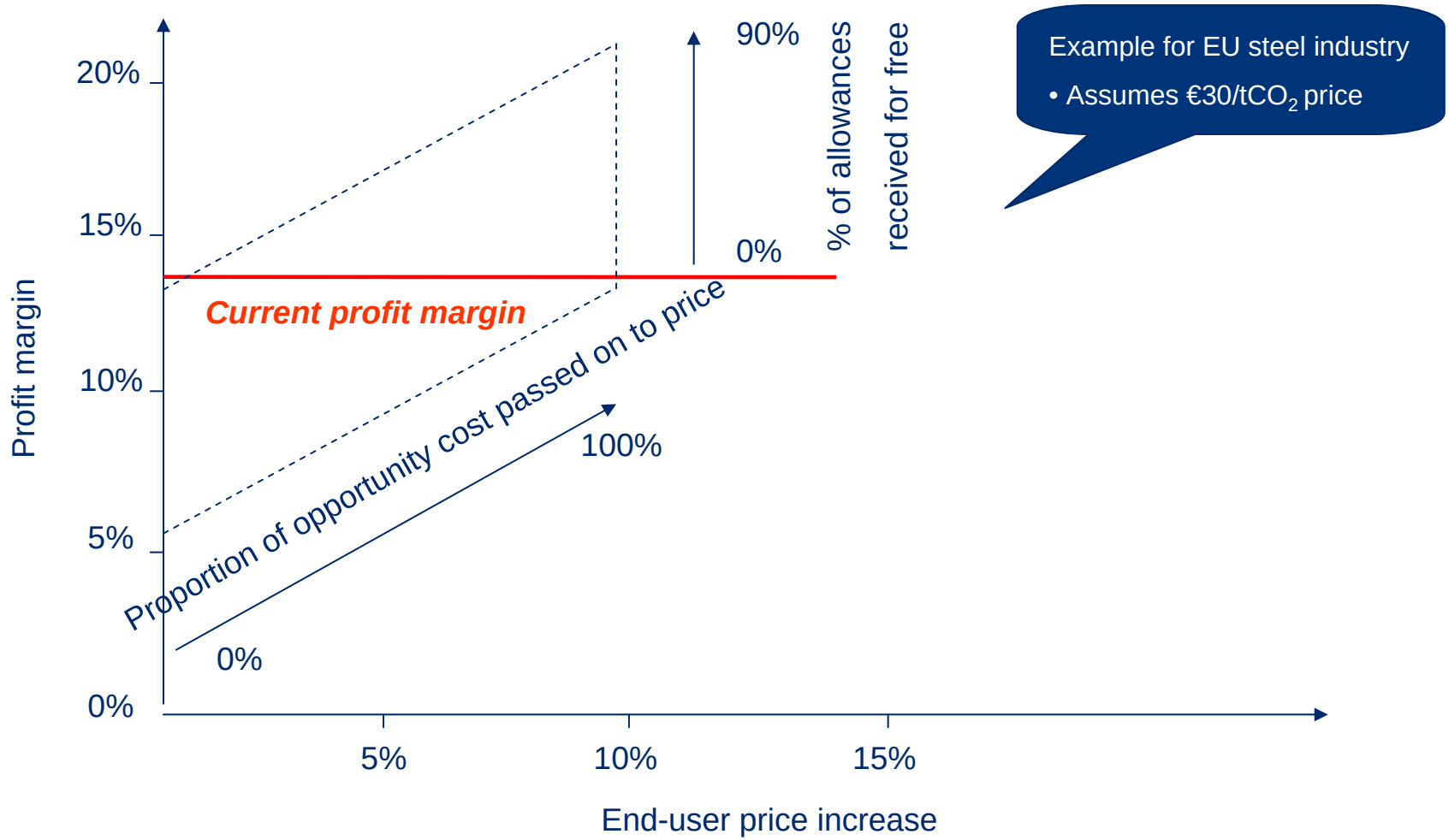
e.g. cement: modest pass through needed to maintain profits but marginal cost change makes imports competitive near coastal ports

	Increase in marginal production cost, % of profits*	Cost pass-through required to maintain sector operating profits: Proportion of increase in marginal cost passed through to prices, %	Cost pass-through required to maintain sector operating profits: Increase in wholesale cement price, %
€15/tCO_2 no cutback –elec cost only	70.5%	7.5%	2.0%
€30/tCO_2 15% cutback	141%	25%	10%

** Cost expressed relative to profits are about twice costs relative to value-added for cement production; cement production forms about 12% of construction materials sector value-added*

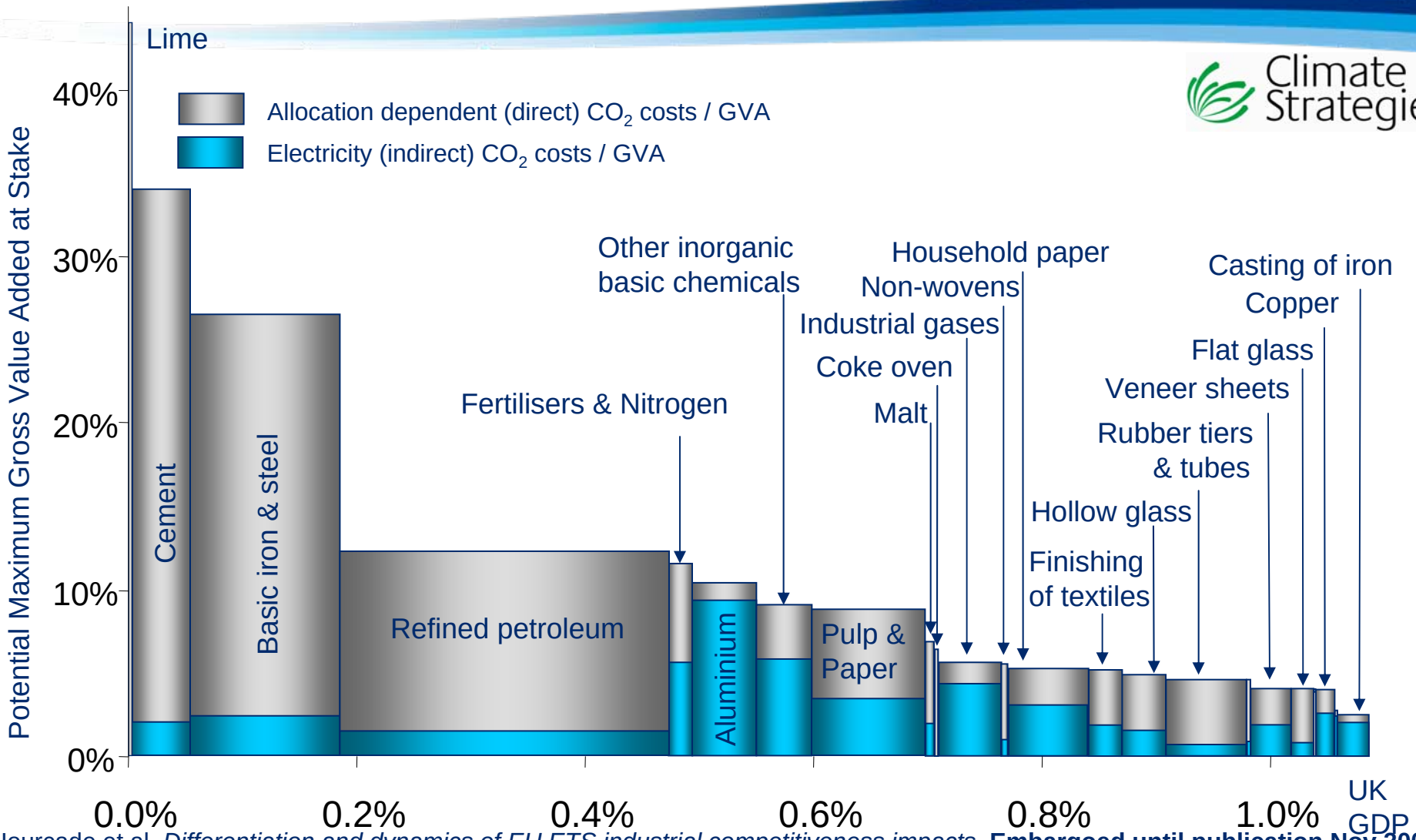
Profit-maximising pass-through predicted by Cournot modeling: >50%

Free allowances combined with cost pass-through decisions determine profit or loss relative to current situation …



There is a tension between profit-maximisation and market protection to 2020

Competitiveness impacts in a world of unequal action are small macroeconomic, but significant for a few specific sub-sector production activities



Hourcade et.al. *Differentiation and dynamics of EU ETS industrial competitiveness impacts.* **Embargoed until publication Nov 2007.**

CO_2 = €20/t CO_2; Electricity = €10/MWh

Allocation, profit and competitiveness: understanding the Five Principles

- *In general,* the economic rents associated with CO2 constraints mean that free allocation gives *potential* to profit, subject to:

  (a) degree of alignment of allowances with costs (eg. Not sectors outside EU ETS or affected primarily by electricity pass-through costs)

  (b) constraints on cost pass-through due to imports and other factors

- Profit and market share are not synonymous, and *in short term they are usually in opposition*
- Accumulated evidence confirms that where there are competitive power markets, power sector is passing through bulk of opportunity costs, resulting in substantial profits and downstream costs
- Most other sectors within EU ETS can be expected to profit but to much less degree, with some loss of market share over time, details complicated by details of market regulation, by international trade, and by downstream company, regional and product differentiation
- New entrant, closure, and incumbent allocation rules all affect the incentives, pricing and efficiency of the scheme

Fundamental issues in allocation (ctd)

- Comparative *vs* collective politics of allocation
- Costs and 'Windfall' profits
- **Efficiency and perverse incentives**

Repeated allocations to incumbents can lead to significant distortions

- degree and nature depends on allocation method

Allocation method

Allocation method	Discourage closure of plants	Discourage closure of inefficient plant	Increase operation of inefficient plants	Reduce incentives for Efficiency-improving investment
Auction				
Capacity	X			
Capacity and technology	X	X		
Historic output	X		X	
Historic output and technology	X	X	X	
Historic emissions	X	X	X	X

Distortions

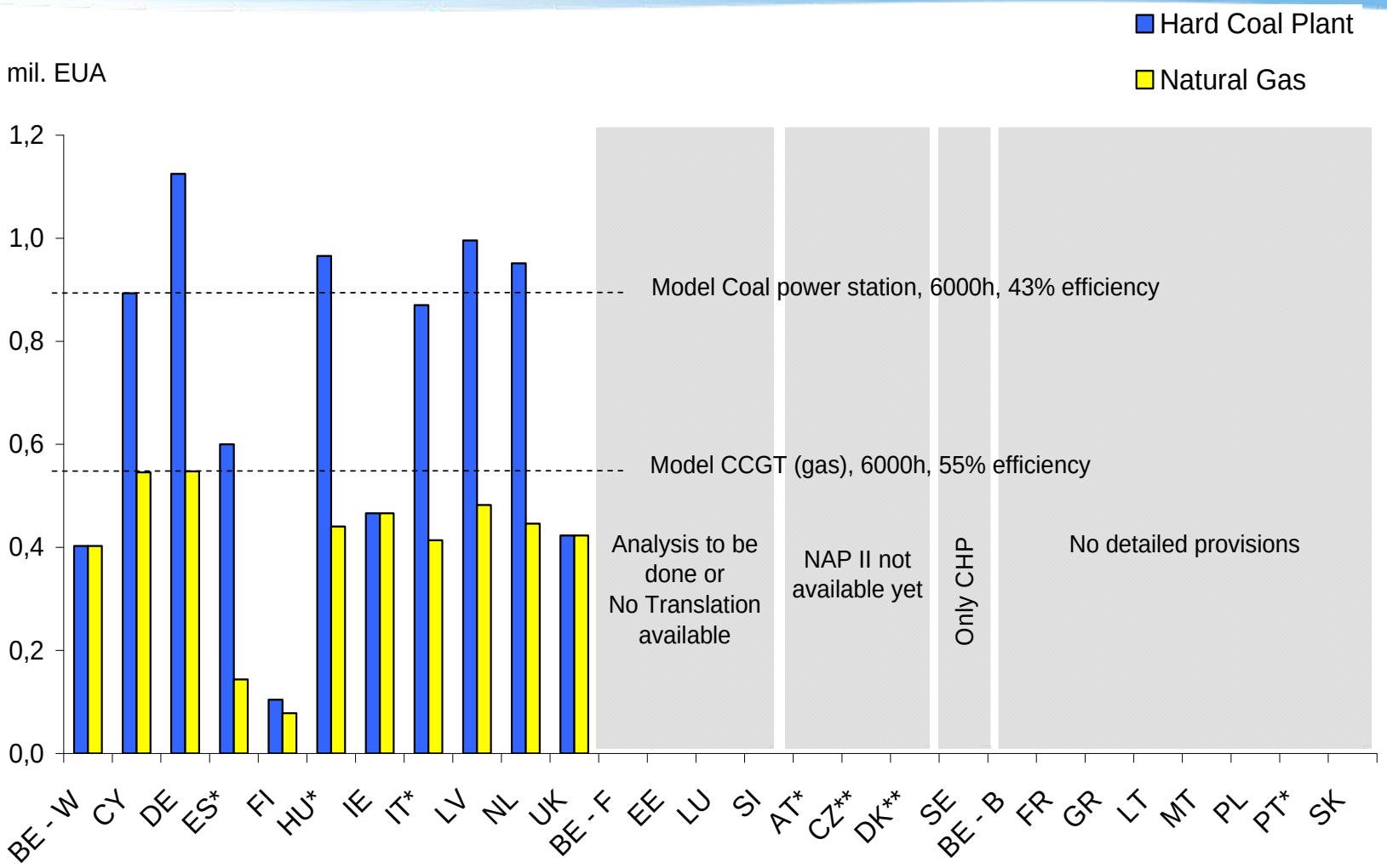
Distortions increase emissions and/or price impacts

Excess carbon-intensive capacity

Inefficient fuel choice

Less energy-efficiency investment

The new entrant details matter: the German NAP provides the biggest subsidies for new coal plant (the more it emits, the bigger the subsidy)



Phase II: the fallout

- An ‘major updating’ of the simple theory that allocation doesn’t matter
  - Overall cap is crucial
  - Who gets the money matters!
  - … overall, and relative between countries
  - Risk of perverse incentives from free new entrants and ‘updating’ free allocations
- Focus on allocation as the critical determinant
  - Viability of market
  - Complexity of the system
  - Modest moves to benchmarking
- Commission intervention big *de facto* centralisation of powers
- Reminder of the centrality of international context

EU ETS Phase III: Cap setting & allocation

EU-wide cap to be agreed up-front

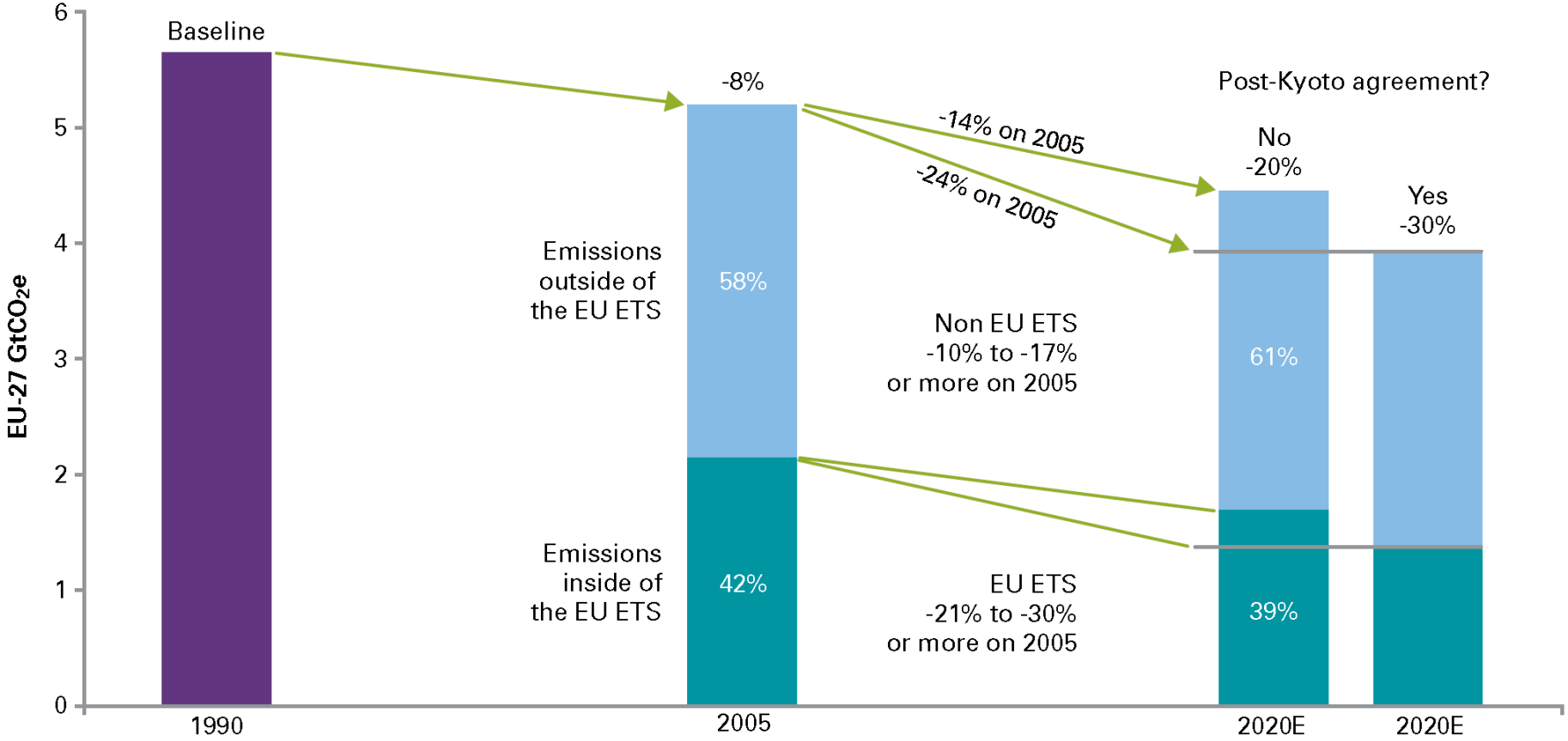
- Linear decrease project to continue
  - predictable trend-line to 2020 ***and beyond*** (annual decrease by 1.74%)
  - review by 2025

Harmonised allocation rules to ensure level playing field:

- Auctioning as the general principle with transitional free allocation, three categories:
  - No free allocation (i.e. full auctioning) – power sector
  - Partial free allocation, starting at 80% rel.to 2005 base declining to 30% by 2020
  - Up to 100% free allocation for 'internationally exposed ….' with 2010 review on which sectors and 2011 on options..
- EU-wide rules, e.g. benchmarking, taking into account most efficient techniques, substitutes, alternative production processes, use of biomass and CCS

EU greenhouse gas emissions split roughly 40:60 between ETS and other sectors

- component 2020 targets fall more heavily on ETS

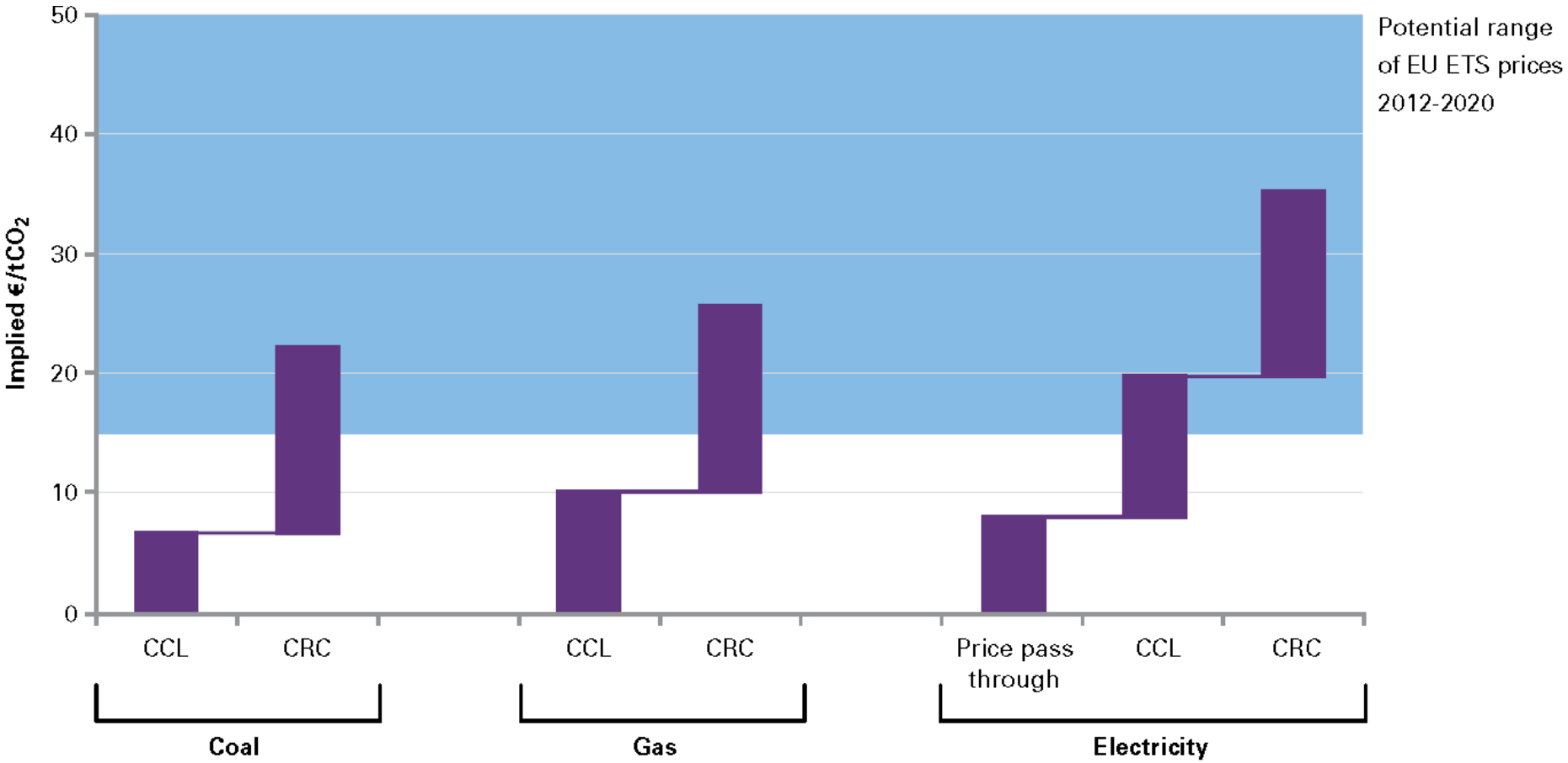


Source: European Commission; Carbon Trust analysis. Note, EU ETS based on phase II scope, does not reflect proposed expansion in scope of the EU ETS. This expansion will have the effect of maintaining, or even growing the EU ETS share of emissions out to 2020.

Note: The proposals do not exactly specify how the extra abatement to reach a 30% target would be split between emissions inside and outside the EU ETS.

Small facility opt-outs require demonstrating 'equivalence of effort'

- In UK, Carbon Reduction Commitment (for less energy-intensive sectors) may be crucial in this and offers much lower transaction costs



Source: Carbon Trust analysis based on currently suggested starting Carbon Reduction Commitment (CRC) price of £12/tCO_2, 2008 CCL rates, an exchange rate of 1.3 €/£, 30% electricity CO_2 price pass through and using DEFRA 2008 emissions factors.

EU ETS prices, auctions and money

- Commission projection of EU ETS price rising to €39/tCO2 by 2020 in absence of an international agreement
- In liberalised power markets, this feeds though to power prices (c. €10-30/MWh)
- EU ETS Auctions could raise around €50bn/yr by 2020
- Auctioning rights distributed to Member States, but relatively more rights to MS with lower GDP/capita
- Commission proposed 20% of auction revenues to be used for wide range of climate change activities including technology, avoided deforestation and international assistance for adaptation
  - tentative shift in emphasis about what's required to solve climate
  - still strongly contested

Conclusions

Some ‘internal design’ policy lessons

- **It can be done**, but no practical economic instrument is ‘pure’ - changing relative prices creates struggles and some distortions inevitable
- **Industry attitudes change** once the instrument is adopted: lobbying then focuses upon ‘getting the best’, and ‘the best’ has been large aggregate profits for some sectors
- **A ‘first phase’** relatively short trial period is invaluable – many actors just don’t understand the system, or believe economic analysis, until it starts happening..
- Don’t be too ambitious about the **lower size threshold** or **extent** initially
- **Greater auctioning** over time can address many of the imperfections (particularly if introduced with a ‘reserve price’)

Evolution has been essential, and interesting

- Phase I
  - proved market design and allocation problems,
  - gave actors expertise and demonstrated
  - revealed serious problems around caps (excessive) and allocations (windfall profits and perverse incentives)
- Phase II
  - tackled aggregate caps with *de facto* centralisation of *caps*
  - fuelled debates around perverse incentives,
  - allows most participating sectors to profit and build up reserves to help fund low carbon adjustment,
  - will give auctioning experience
- Phase III
  - The unlamented death of 'national allocation plans'
  - The somersault on allocation goals and application to power sector, barely resisted
  - Encroaching auctions, reluctant move to accept as a 'default' goal subject to leakage concerns
  - Cracks in the dam around 'downstream allocation' – through revenue
  - .. And the other continuing struggles:
    - What is a benchmark?
    - What sectors are 'at risk of carbon leakage'
    - The use of revenues

Grubb, Pollit and Jamasb (2008): *A low carbon electricity system for the UK – technology, policy and economics*, CUP.

Carbon Trust (2008): *Cutting carbon in Europe: the 2020 plans and future of EU ETS.* www.carbontrust.co.uk

Climate Strategies research & website as a public source of information and analysis. www.climate-strategies.org

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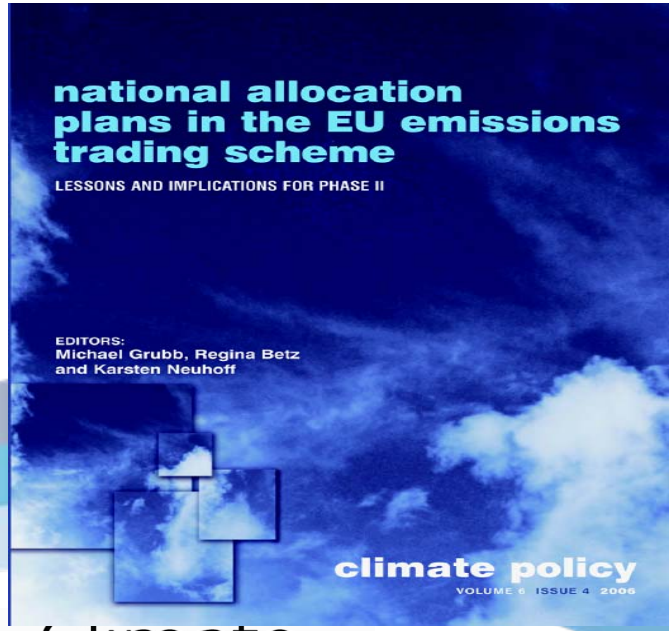
Vol 6.1: Allocation and competitiveness
Vol 6.4: Phase I Lessons & Phase II analysis



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