Cutting carbon in the European Trading Scheme:
lessons, prospects and implications

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Outline

- The evolution of the European Emissions Trading Scheme to date
- Phase II allocation battle
- Profits and Competitiveness
- Beyond 2012: the new package
- Core Conclusions

Evolution of the EU ETS

Emissions cap-and-trade has emerged as the 'economic instrument of choice' ..

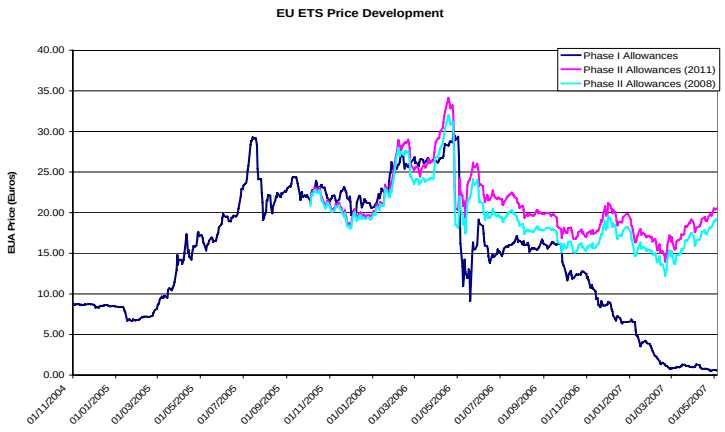
A limit is set on total allowed emissions in a given period, allocated between participating companies as initial *allowances* that can then be freely traded, so that:

- Imposes direct cap on *aggregate* emissions – the source of the problem
- Efficiency emerges from free trading – companies have the freedom of choice to seek out lowest cost abatement opportunities
- Market-based, lowest-cost 'price of carbon' emerges from the trading market
- Unlike a carbon tax, the carbon price is achieved without a large transfer of money from industry to government – indeed, allowances become an asset on balance books

EU Emissions Trading Scheme –
the central instrument for emission reduction and 'backbone' of Kyoto implementation

Participants	• All EU 27 countries • All electricity, ferrous metals, cement, refineries, pulp & paper, glass and all facilities > 20MW, total >40% of EU emissions • Aviation to be included from 2011 (internal) and 2012 (external) • International links through Kyoto project crediting
Allocation	• Member states develop National Allocation Plans (NAPs) by sector and installation • To be consistent with Kyoto target and anti-subsidy provisions
Timing	• 2005-7: phase 1, no national target, opt-out provisions • 2008-12: governed by Kyoto target, opt-in possibilities • 2013+: Design proposals now in consultation process
Key issues	• Market price – uncertainty – driven by NAPs, relative coal-gas pricing, and emerging nature of market • Specific allocation & incentive issues – including new plant, plant closure, etc • Competitiveness and leakage concerns • Linkage to other emerging trading schemes

EU ETS Phase I prices volatile, complex determinants, and ended with slide towards zero whilst forward market for Phase II took over at price €20-25/tCO2



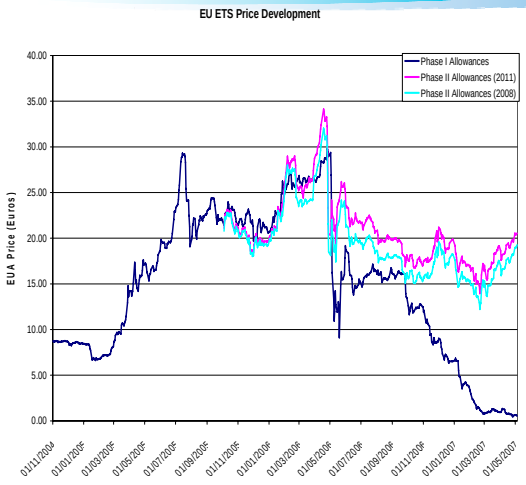
€20-25/tCO2 = c.US$25-33/tCO2 = c. US$100/tC

Phase I, intended as the initial, trial phase, proves success in market design and verification, reveals important lessons on profits and allocation

- An EU-wide market that gives value to company efforts to reduce CO2 emissions, and incentivises them to seek out the least-cost means of doing so
- The market mechanics have worked well – extensive trading through various mechanisms
- The stringent verification requirements have proved effective and valuable
- .. But raise questions about whether the threshold of 20MW thermal is too low, increasing transaction costs for small environmental gain
- Disputes continue over the reasons for the surplus in 2005 - but it is some combination of overallocation and greater than predicted abatement (eg. in cement sector)
  - 2005 Surplus was 5%
  - Abatement represented … how much .. best estimates c. (c. 25-75% of surplus) 50-100MtCO2 in 2005

Lessons from Phase I – complex price incentives and big profits for power generators

- also link emerging between rents and technology investment

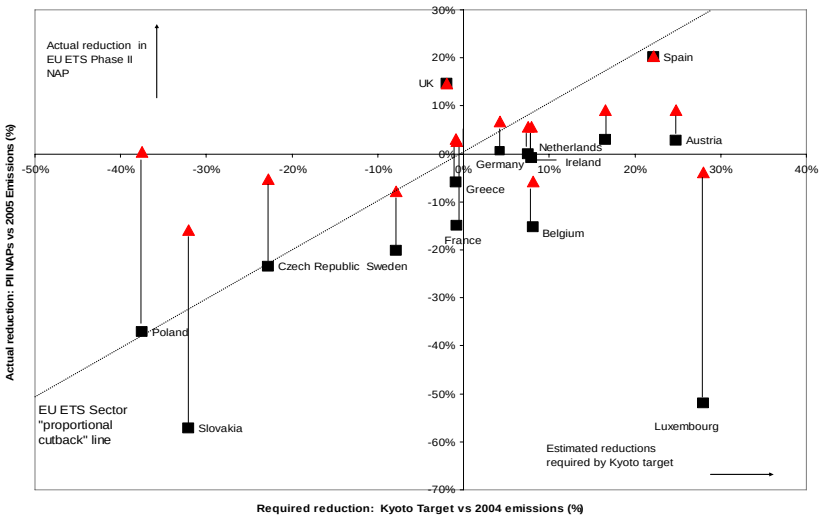


- Power sector profits from EU ETS €5bn+ during 2005
- Likely aggregate Phase II profits €5-10bn/yr @ €20/tCO2
- International and sectoral investment linkages emerging through the CDM
- **Also funding technology**
- E.On announce €100m R&D Centre
- UK Environmental Transformation Fund announced 'co-incident' with Auctioning decision
- UK €1bn National Institute for Energy Technologies (NIET) announced to be 50:50 co-funded with private sector, initial sponsors E.On, EdF, Shell, BP.

The Phase II allocation battle

Commission intervention cut more than 10% from Member State proposals

based on Kyoto consistency & anti-subsidy provisions



Implications of the Phase II allocation battle

- EU ETS allocation c 200MtCO2 below projected "business as usual" – potential to save c.1000MtCO2 during 2008-12
- A 'robust market' – prices around €20-25/tCO2, real incentive to cut emissions by participants
- Substantial international investment in emission-reducing projects in developing countries
- Interesting insight into "bottom-up vs top-down/Kyoto" debates: "top down rescued the bottom-up"
- A remarkable centralisation of allocation powers in Europe

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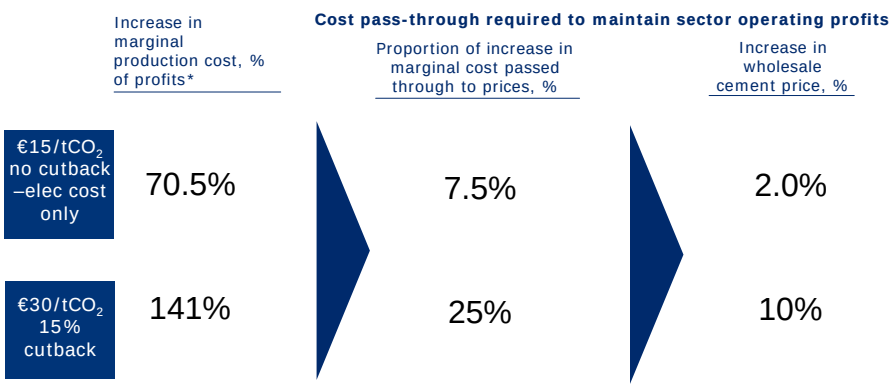
Profits and competitiveness

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**



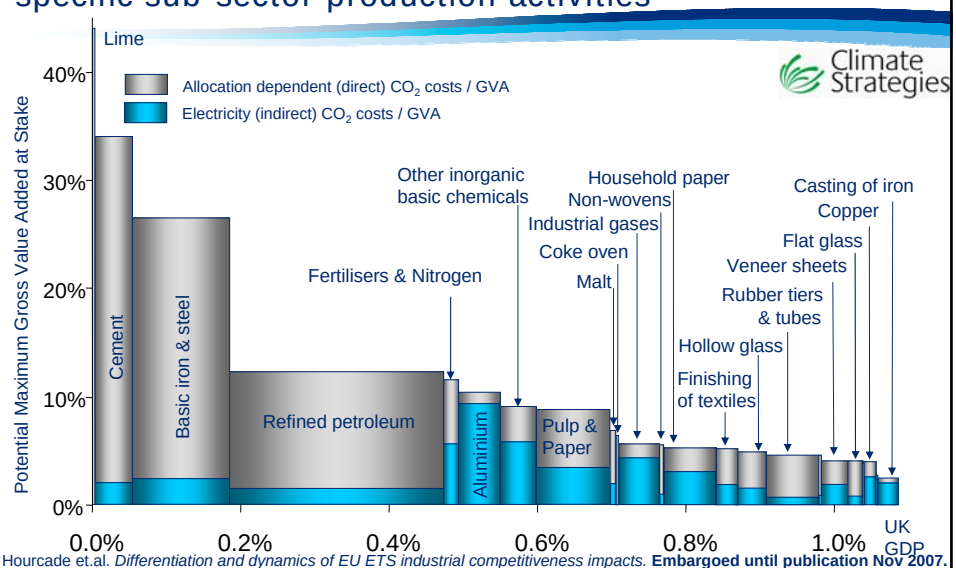
**** Cost expressed relative to profits are about twice costs relative to value-added for cement production; cement production forms about 12% of construction materials sector value-added***

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

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

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



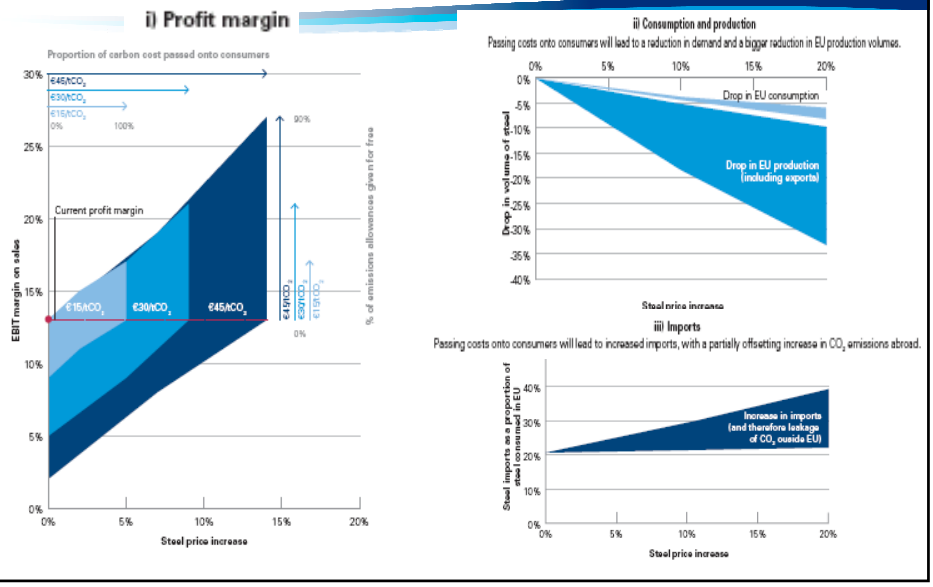
Hourcade et.al. *Differentiation and dynamics of EU ETS industrial competitiveness impacts.* **Embargoed until publication Nov 2007.**
CO_2 = €20/t CO_2, Electricity = €10/MWh

Out of 159 UK manufacturing activities studied, only a few are potentially exposed: *classification & responses*

Significantly: cement/clinker; steel from blast oxygen furnaces; aluminium.	EU cement and steel producers could lose up to 8% market share to overseas production in central price cases with highest trade sensitivities. Sufficient free allocation to maintain their profits can buy time to negotiate a multilateral response to trade exposure.
Plausibly : fertilisers & nitrogen compounds; 'other' inorganic basic chemicals; pulp and paper	Should be in the EU ETS with a compensating rate of free allocation, combined with others measures to help them tackle their exposure to carbon and electricity costs.
Potentially at higher C prices: some refineries; manufacture of glass; household paper; tyres; copper; possibly 1-2 other basic chemicals	At higher carbon prices some products from some refineries and from a few other big activities could face trade impacts. Should be in the EU ETS; modest free allocation in Phase III, particularly for new sectors. would protect profits and give time to invest in lower carbon solutions, but should not extend beyond that.
Exposed, but very small: Notably lime production	Loss of market share to overseas production would involve tiny absolute carbon leakage. A political decision as to whether to ignore, offer protection, or exempt.

Combination of allocation and cost pass-through decisions drive profit or loss

- latter drives consumption, leakage & hence production impact



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Design of the EU ETS post 2012

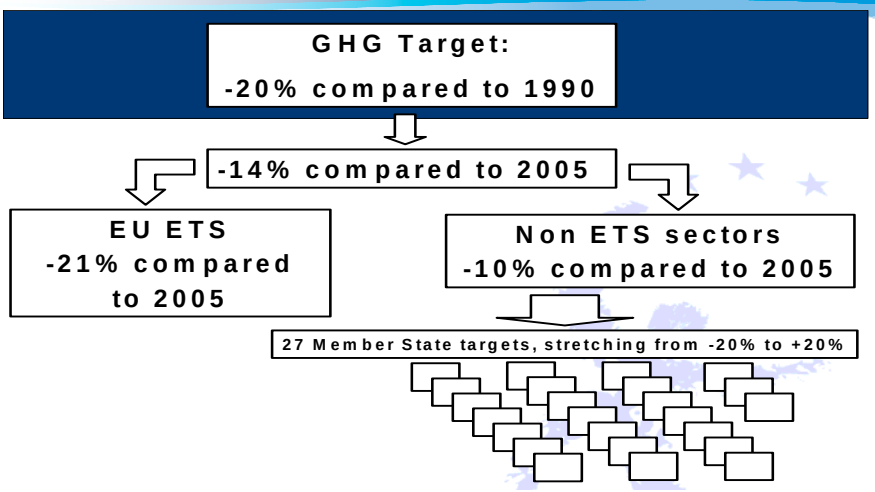
Setting the scene

- the EU Council of Ministers '20:20:20 by 2020' targets:
  - 20% GHG below 1990
  - 20% improvement in energy intensity
  - 20% of EU-27 *final energy consumption* from renewables
- responsibility of Commission to bring forward implementation proposals, released 23 Jan:
  - Phase III design of the EU ETS
  - National CO2 emission targets for rest of economy
  - Renewables Directive devolving renewables obligations for each Member State with 'origin' flexibility
- The goal of Europe as a leader in low carbon, high efficiency and renewables towards deep mid-Century reductions

Key points of the Commission EU ETS proposal

- Scope, definitions and legal bases
  - Definitional clarifications & thresholds – combustion plants; small installations
  - New sectors
    - Deletion of "ferrous" – Aluminium & other non-ferrous included
    - Rock wool, gypsum – for 'balance' with glass wool
    - Chemical industry the big one (basic organic; nitric, adipic, glyoxal and clyoxoylic acid; ammonia..)
    - H2 production, soda ash and sodium bicarbonate
    - + CCS-related technologies
- Harmonised allocations – the disappearance of National Allocation Plans and shift to auctioning as the 'default' with no free allocation to power sector, to avoid profit-making and distortions
- Auction rights to remain with Member States but with some internal redistribution

GHG target – two-tier approach



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 and phased out 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 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. €20-30/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 proposes 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

The many roles of the 'flexible mechanisms'

- Complex rules around use of the CDM
  - Unused project credits in system banked from 2012
  - Automatic post 2012-crediting for projects from Least Developed Countries
  - Non-traded sector access
  - 'Community projects'
  - More expansive rules in event of international agreement
- Incentives to participation
  - Much more generous rules
  - To match much stronger commitment, -30% below 1990, in event of international agreement
- The balancing act:
  - Flexibility without undermining domestic effort
  - Efficiency without unacceptable levels of international transfers
  - CDM as political glue
  - reference to crediting rules even in absence of international deal, etc
- Use of revenues for international cohesion

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 until it starts operating
- 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’)

Capacity to evolve is essential

- Phase I
  - proved market design and allocation problems,
  - gave actors expertise
  - Revealed serious problems around allocation
- Phase II
  - tackled allocation
  - will reveal the problems of perverse incentives,
  - allows most participating sectors to profit and build up reserves to help fund low carbon adjustment,
  - will give auctioning experience
- The Phase III proposals reflect these lessons and mark a new level of ambition with a more explicit view to the international dimensions

Climate Strategies research & website as a public source of information and analysis

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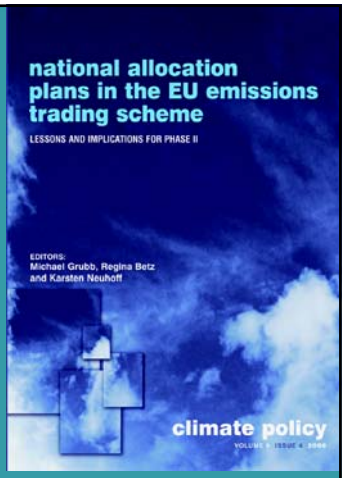

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Making business sense of climate change