

# Allocation and competitiveness In the EU ETS

Issues & Options for Phase II allocation and beyond

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# EU ETS allocation and competitiveness: Collaboration between researchers in UK, Netherlands, Germany and France

Allocation and competitiveness in the EU Emissions Trading System: <b>policy overview</b>	Grubb, Neuhoff  
Emissions, firm profits, and market prices: the consequences from emissions trading	Smale, Hartley, Hepburn, Ward, Grubb
CO2 cost pass through and windfall profits in the power sector	Sijm, Neuhoff, Chen
Allocation, incentives and distortions: the impact of EU ETS emissions allowance allocations to the electricity sector	Neuhoff, Keats, Sato
CO2 abatement, competitiveness and leakage in the European cement industry under the EU ETS	Demailly, Quirion
Free Allocation of allowances under the EU Emissions Trading System – legal issues	Johnston
Auctioning of EU ETS Phase II allocations: how and why?	Hepburn, Grubb, Neuhoff, Matthes, Tse



## Headline conclusions for Phase II (2008-12): Three recommendations

- Substantial overall cutback required, differentiated according to competitiveness exposure, auctions used to re-inject supply
  - Bigger cutback for power sector but some cutback for all
  - Reduces exposure to gaming & state aid problems and increases management attention
  - Reduces wide range of perverse incentives
- Encourage diverse approaches to benchmarking for incumbents but seek harmonised undifferentiated benchmark for new entrants
  - Benchmarking reduces perverse incentives but is complex, experience is required, and must be differentiated to reflect diverse asset base
  - Differentiating new entrant rules risks highly perverse *investment* incentives and 'race to the bottom'
- Auctions crucial, coordinate some % with minimum bid price
  - Revenues to support implementation and adjustment
  - Provides hedge against systemic error in emission projections
  - Provides security for investment

# Headline conclusions for post-2012: Three options and their implications

- Competitiveness is a *strategic* issue about investment location: investment security and efficient operation require EU governments to commit unambiguously to continuation of the EU ETS, but in ways that do not drive investment abroad
- To be credible, design and allocation should be based upon joint exploration with other Kyoto Parties of three contingent options:
  1. Sectoral agreements covering all significant trade partners
  2. Sector- and carbon-specific border tax adjustments
  3. Output-based (intensity) allocation and downstream allocation
- These will require revisions to Directive for post 2012, but not before
- Continued free allocation will also require new institutional foundations analogous to the creation of Central Banks

# Outline and Core principles

Making business sense of climate change

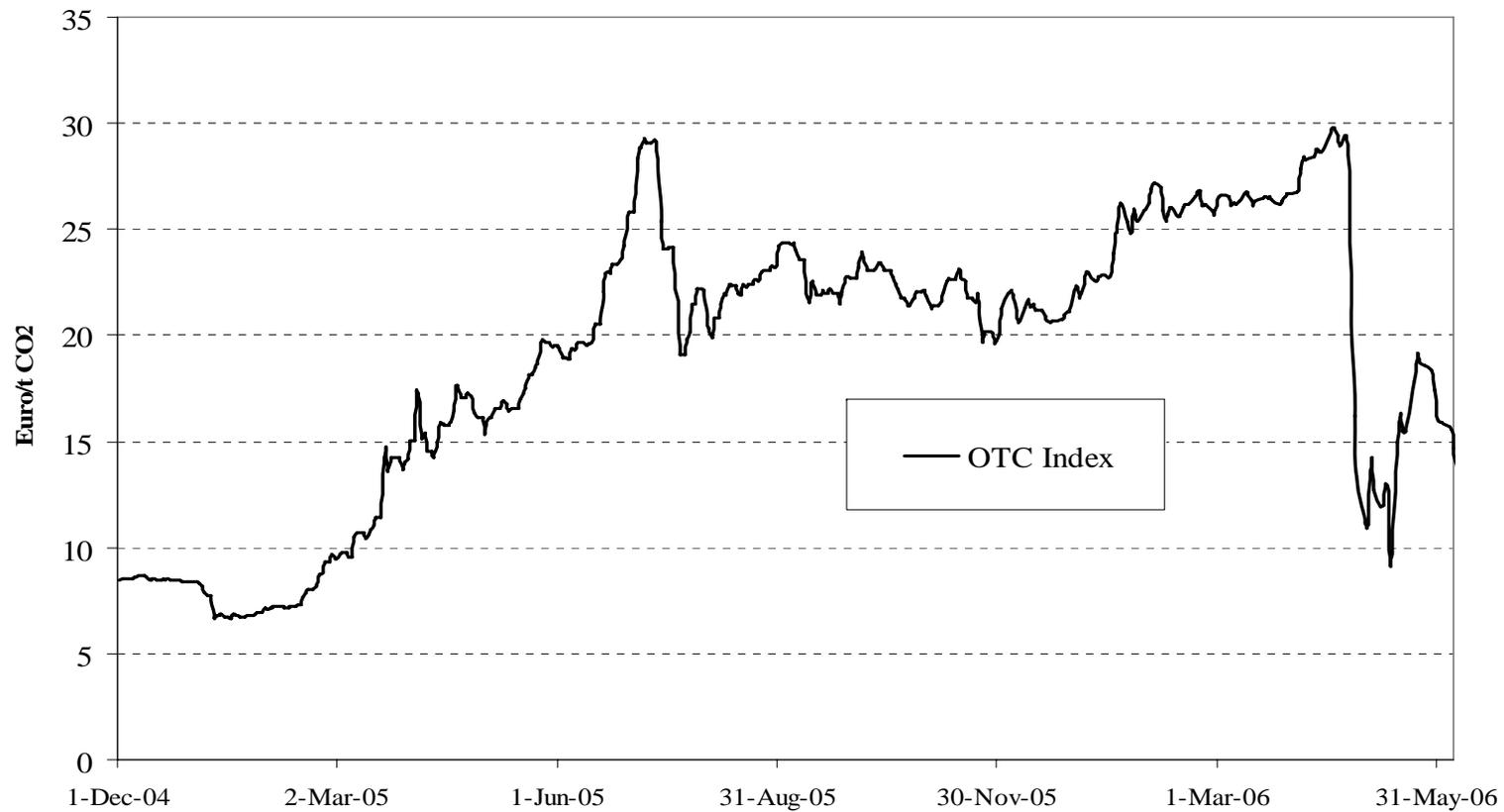


The EU ETS is the focal point of EU and of global mechanisms to incentivise emission reductions  
– *and the collapse of the present market shows that allocation is the Achilles Heel*

- Introduction and core principles
- Electricity sector insights
- Energy intensive consuming industries
- Uncertainty, instability and the role of auctioning
- Core Conclusions

# Price uncertainty and volatility have been problems for the EU ETS ...

**EUA price 1 December 2004-15 June 2006**



Phase I was intended as the initial, trial phase.  
It 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 essential in the light of recent events
- Phase I confirms the predictions that some sectors (notably electricity) profit from the combination of free allowances and passing through the opportunity costs
- The recent market crash underlines that the market is working, but that there are significant problems around the whole process of emissions allocation and projections
  - Inherently unstable price due to cutbacks less than range of uncertainty
  - Risk of very low price arising from weak allocations prompted by concerns and lobbying around international competitiveness and comparison across EU
  - This, associated incentives, and lack of post 2012 certainty are looming concerns

# The recent market crash – and reactions - says it all

- “Allocation, allocation, and allocation ....”
  - The danger of small cutbacks combined with projection uncertainties
  - Gaming of the system given asymmetric information
  - lack of harmonisation makes it a problem of EU coordination
- .. And the response:
- Retrospective political interference undermining market confidence (German proposal)
  - Perverse updating incentives (2005 baseline)
  - The potential shambles for Phase II (banking)

Focusing only on **volume** of allocation is shortsighted and misses issues more important to long-run incentives and competitiveness, ie. influence on prices

	Approx <b>UK</b> domestic output, 2001	Relative impact on value- added of 10% allocation change	Relative impact on value- added of 30% elec pass- through change
Pulp, paper etc	£8bn	0.12%	0.59%
Glass & Ceramics	£4bn	0.07%	0.27%
Cement & construct	£6bn	0.38%	0.46%
Iron & Steel	£8bn	0.73%	0.80%
Electricity	£30bn	1-2%	5%

**Total value of these commodity sales in EU over 2008-12 > €2000bn**

**A 1 or 2% change in product prices generally matters more than the current struggles over allocation and pass-through**

Key is to understand the difference between

⇒ *marginal incentives* – which affect prices and long-run competitiveness

⇒ and *allocation transfers* – which determine short run cash flows

# 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

# Context for Phase II allocations

- At least 90% free allocation (unless successful State Aids challenge forces revision)
- Continued diverse perspectives on prospects with big downside potential on prices
  - Large volume of CDM / JI credits (100-200 MtCO<sub>2</sub>/yr through period from CDM alone)
  - Additional potential supply associated with Kyoto surplus in eastern Europe and other Transition Economies
  - Baselines have been universally readjusted to world of high gas prices: fall in gas prices could remove 10s MtCO<sub>2</sub> from market
- Competitiveness unlikely to be problem in course of Phase II but is a *strategic* issue about expected future revenue streams from investment in different regions
- Investment security and efficient operation require continuation post 2012, but situation likely to take several years to resolve

# Electricity sector insights

Making business sense of climate change



# Impact of CO<sub>2</sub> allowance prices on electricity prices

- **In countries with liberalised markets and competition:**
  - Empirical evidence confirms that generators add opportunity costs
  - CO<sub>2</sub> price of 20Euro/tCO<sub>2</sub> 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 CO<sub>2</sub> prices are not internalised
- And with competitive markets, price pass-through *is* affected both by electricity market structure and CO<sub>2</sub> allocation methods

# Repeated allocations to power sector incumbents can lead to significant distortions, - degree and nature depends on allocation method

## Allocation method

Auction			<input type="checkbox"/>	<input type="checkbox"/>
Capacity	X		<input type="checkbox"/>	<input type="checkbox"/>
Capacity and technology	X	X	<input type="checkbox"/>	<input type="checkbox"/>
Historic output	X		X	<input type="checkbox"/>
Historic output and technology	X	X	X	<input type="checkbox"/>
Historic emissions	X	X	X	X

**Distortions increase emissions and/or price impacts**

Excess carbon-intensive capacity

Inefficient fuel choice

Less energy-efficiency investment

Discourage closure of plants  
 Discourage closure of inefficient plant  
 Increase operation of inefficient plants  
 Reduce incentives for  
 Efficiency-improving investment

**Distortions**

## Is free allowance allocation state aid?

- Free allocation under NAPs involves an element of state aid
- Not been notified or cleared by Commission
- Some aid may be justifiable, e.g. on environmental grounds
- Windfall profits indicate that extent granted unlikely to satisfy proportionality principle
- Phase I experience to be considered in phase II evaluation

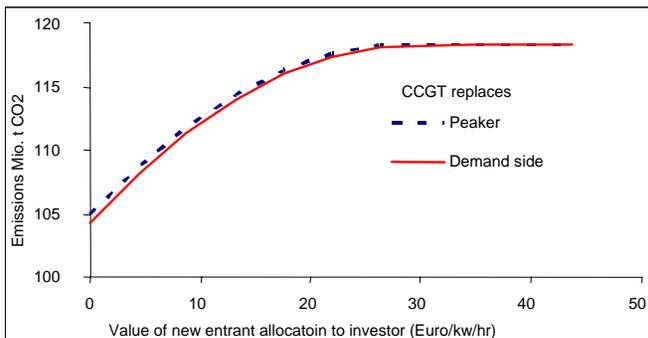
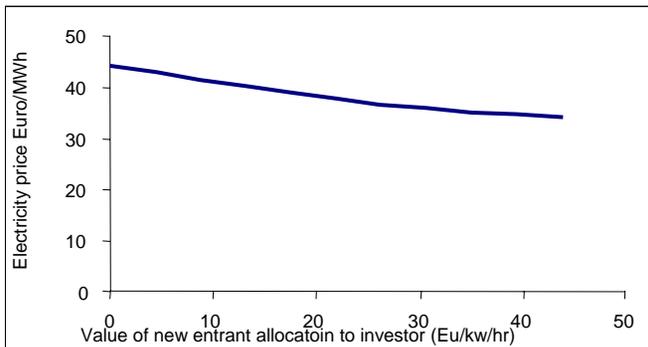
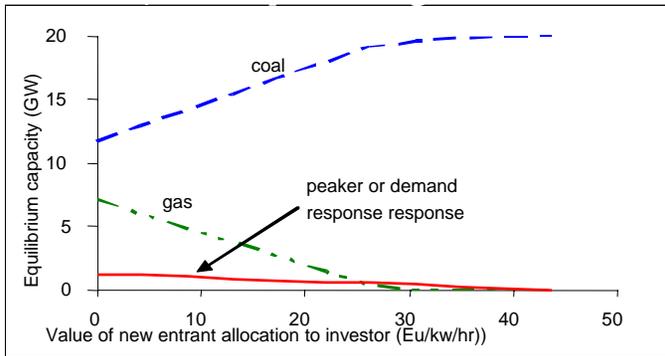
## Closure and new entrant allocation rules can induce additional investment-related distortions

- Withdrawing allocations upon power station closure (“contingent” allocation”) leads to unwarranted life-time extensions (relative to new build), increasing system costs and allowance prices
- Allocation plans grant free allowances to new entrants partly to compensate for distortions created by closure conditions
- If new entrant allocation is fuel or technology-specific
  - The more CO<sub>2</sub>-intensive technology is shielded from CO<sub>2</sub> costs but benefits disproportionately from price uplift
  - Leads to inefficient *additional* investment in carbon-intensive plants, extra costs, and higher long term electricity prices
- If new entrant allocation is based on uniform benchmark (tCO<sub>2</sub>/kWe)
  - Acts as a capacity payment supporting all new investment
  - Can reduce electricity prices as it reduces scarcity premium and lowers marginal carbon intensity over time

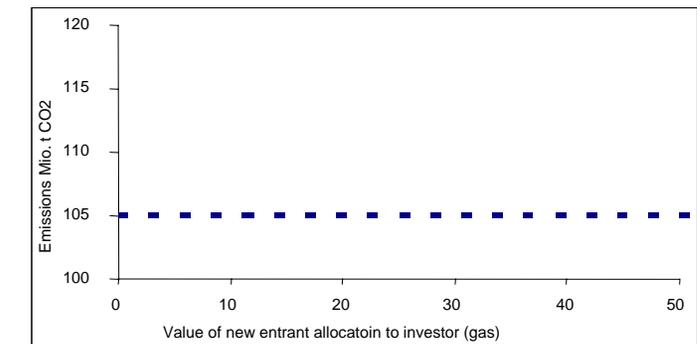
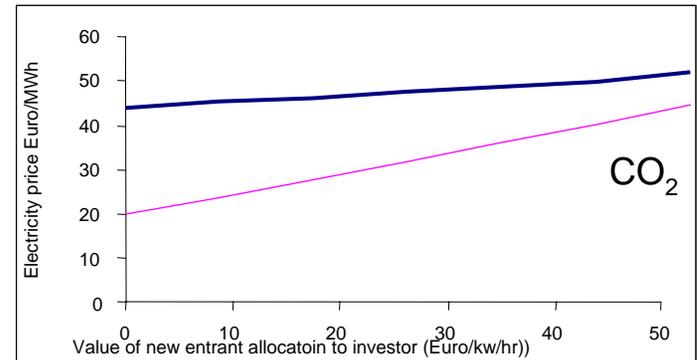
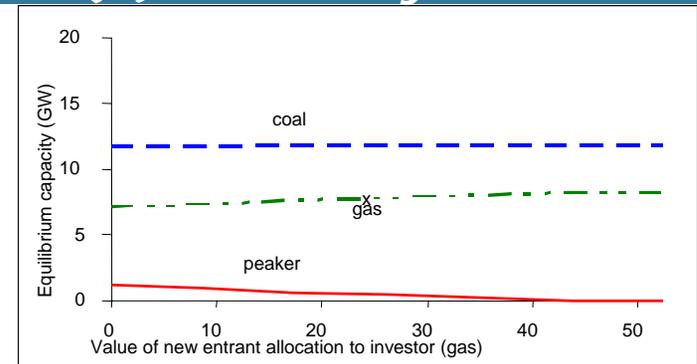
## 2a Avoid fuel specific new entrant allocation

... generates some mix of increased emissions and increased costs

(a) Open system



(b) Closed system



Installed capacity

Electricity & CO<sub>2</sub> Price

Emissions

# How much do these theoretical distortions matter?

- If power sector expects gas prices at levels up to c.2003, or expects free allocations to decline substantially across all technologies, perverse incentives may be short-run but not long-run / investment problem
- But many companies really “believe” the most recent evidence – and under current gas prices and allocations, if projected forward, allowance updating results in construction of new coal fired power stations
- *... even if these coal plants are subsequently rarely used, the value of allowance sales (opportunity cost) makes investment profitable and inflates future electricity prices*

*An inherent logic must minimise special closure rules and drive new entrant allocation rules towards capacity-based benchmark across EU*

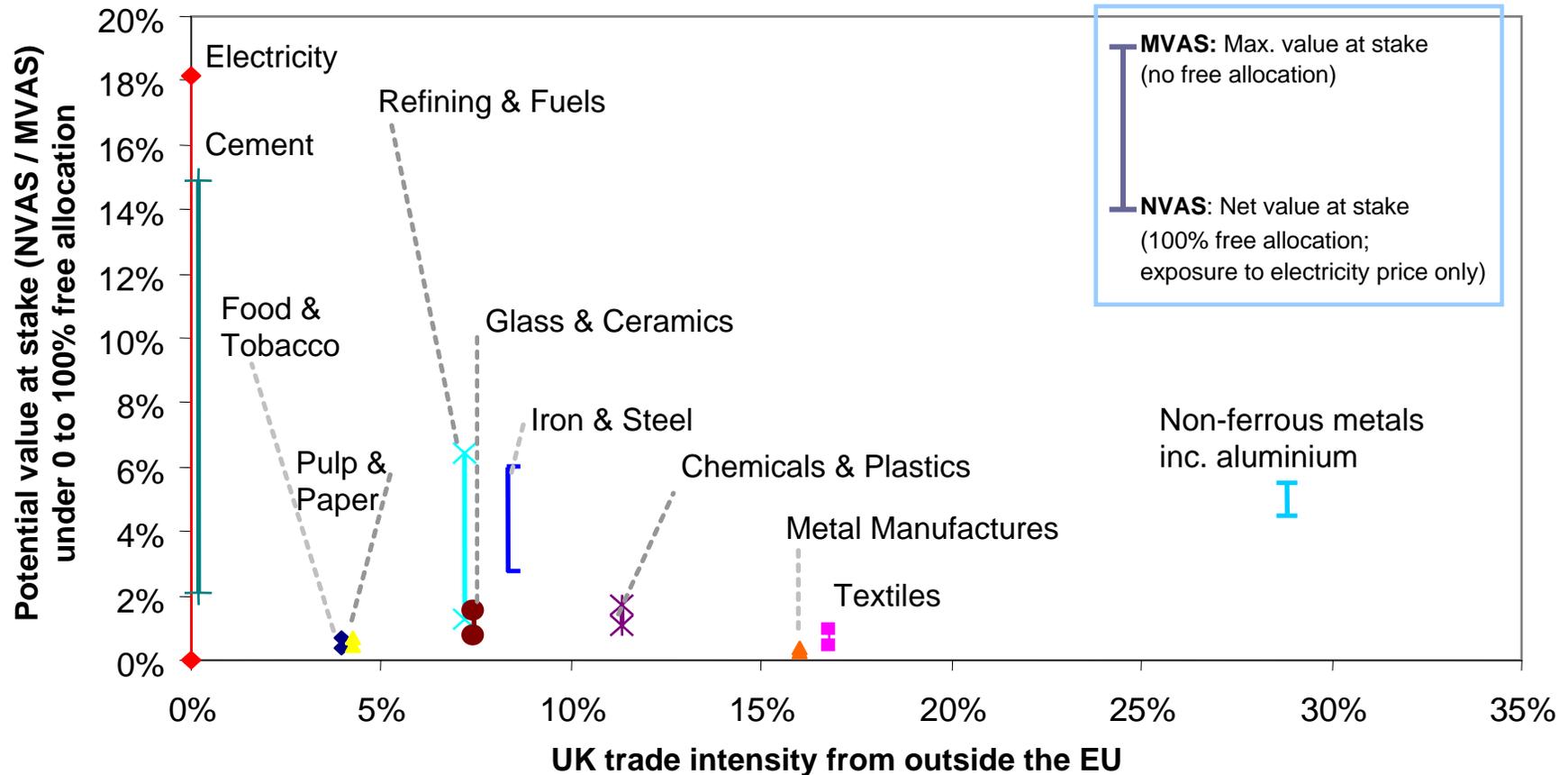
# Energy intensive consuming industries

Making business sense of climate change



# Costs & competitiveness: profit/loss depends upon pricing policies and incentives, allocation, and trade situation

*net value-at-stake insufficient for major Phase II problems*

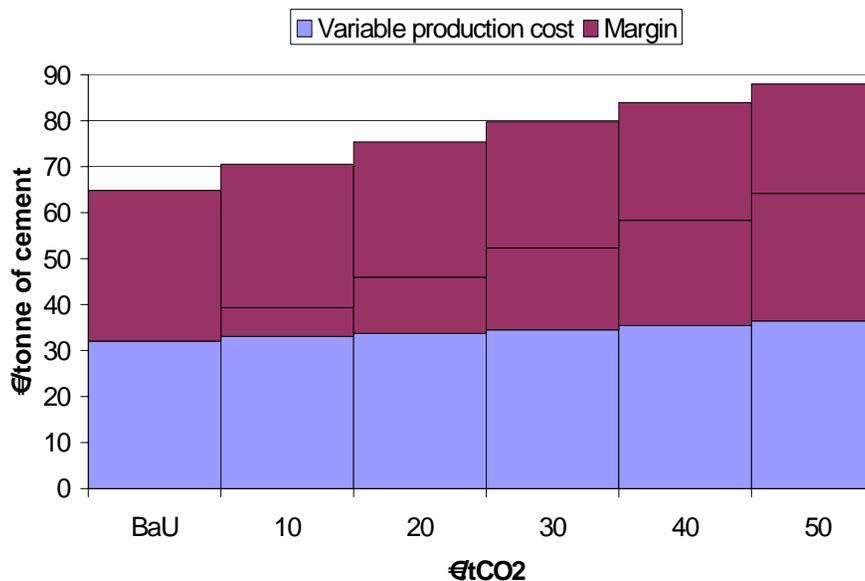


- **Upper end of range:** zero free allocation
- **Lower end of range:** 100% free allowances (effect of €10/MWh electricity price increase to sectors)
- Assumes allowance price of €15/tCO<sub>2</sub> and no CO<sub>2</sub> price pass through in sector

With fixed allocation, domestic cement costs rise and profit-maximisation leads to big profits with erosion of market share

### COSTS

Variable production cost increases;  
 → CO<sub>2</sub> opportunity cost increases but less than proportionally.

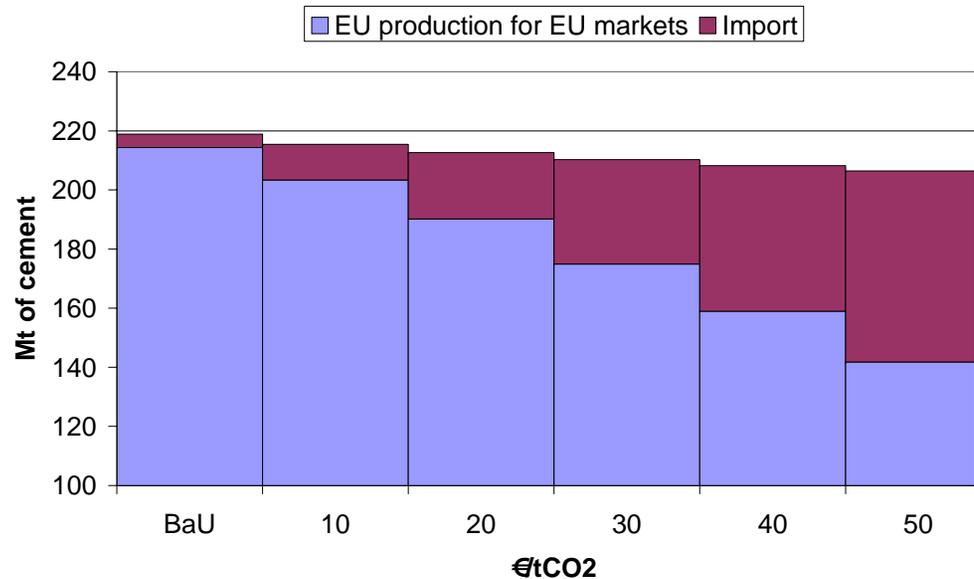


Margin over variable production cost increases, large aggregate sector profit

For 20€/tCO<sub>2</sub>, extended cost: +14€/t cement (~200km by road) domestic price: +15%

### VOLUMES

consumption not highly hit (-3% for 20€/tCO<sub>2</sub>) but big rise of imports  
 → Exports collapse.

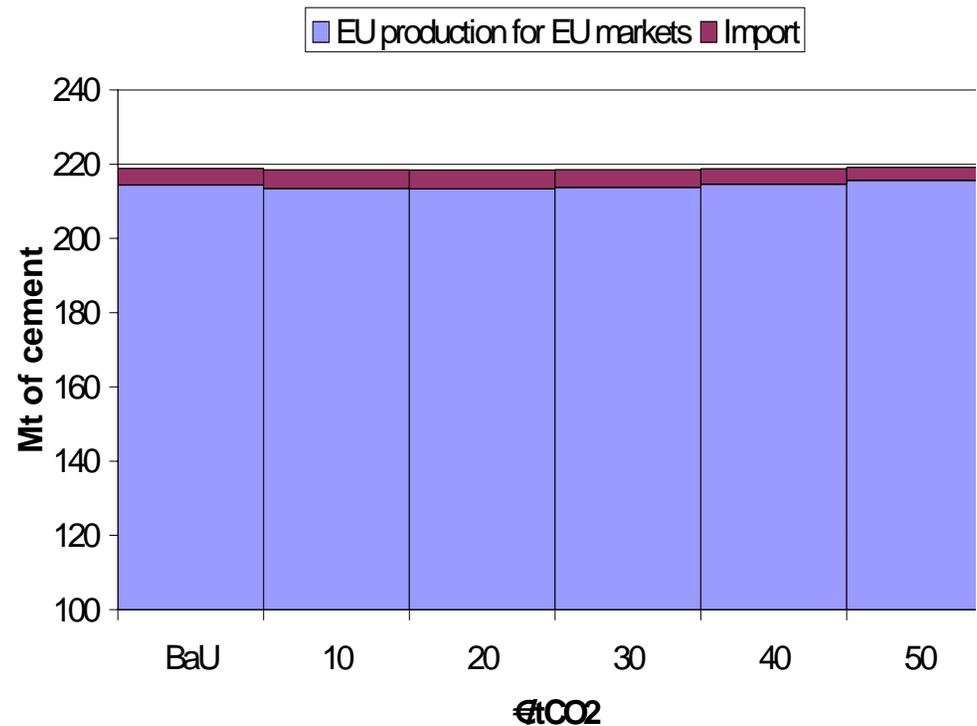
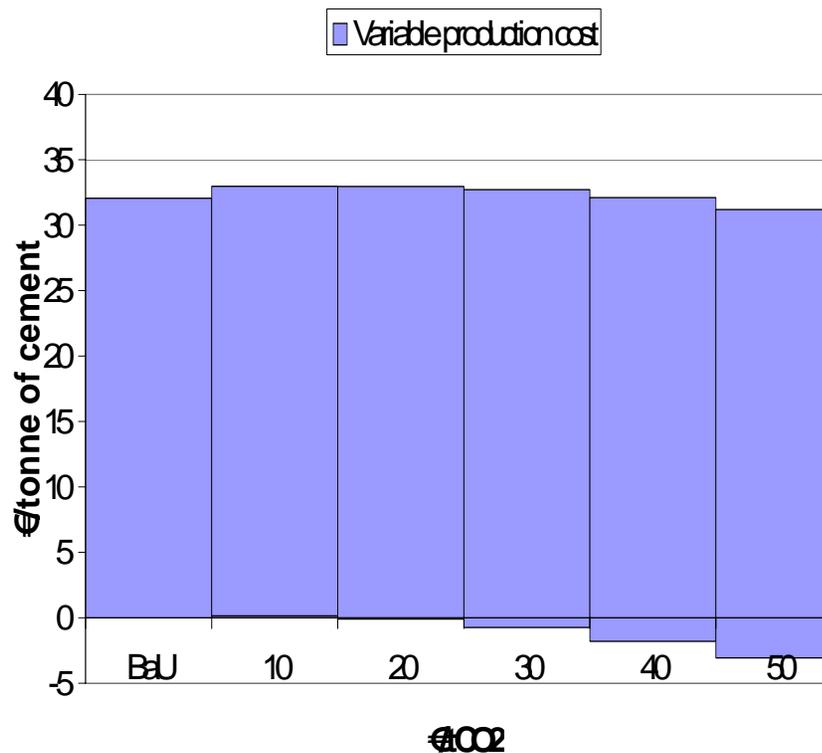


EU aggregate imports rise from 2% in BaU to 10% of consumption for 20€/tCO<sub>2</sub>

Output-based (intensity) allocation, per tonne of cement produced, changes picture dramatically by aligning marginal (opportunity) costs to average costs

### COSTS

### VOLUMES



.... But shields the economy from the true cost of carbon and incentives for radical process innovation that avoid carbon-intensive intermediates ...

# Cement sector studies highlight the tradeoff between profit-making and market share, and that “leakage” can hinge on allocation methodologies

- **With ‘grandfathered’ allocations:**

- ✓ Aggregate EU cement producers EBITDA can increase (if allocation > 50% historic) due to increasing cement prices, but at cost of rising import penetration in coastal areas, resulting in:

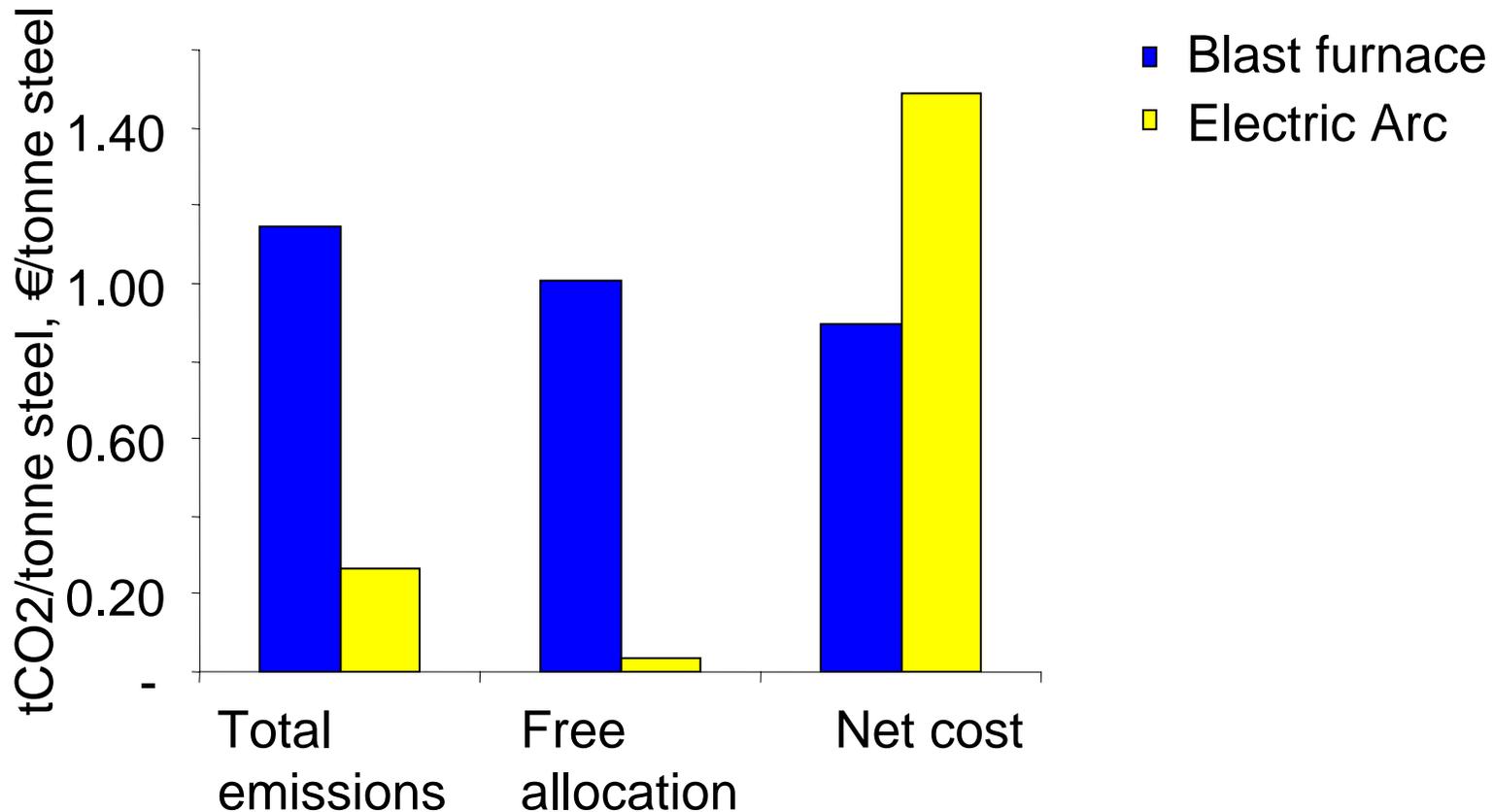
- significant production loss
- major redistributive effects within EU cement sector
- CO<sub>2</sub> leakage rate up to 50% of domestic savings

- **With output-based allocations** (“instantaneous updating” per unit output):

- ✓ Little impact on cement prices or imports (if allocation ratio > 50% historic)
- ✓ Very little impact on production & EBITDA
- ✓ For a given CO<sub>2</sub> price, abatement is halved compared to grandfathered allocation but leakage is small, so world emission impacts are similar
- ✓ Modest boost to *exports*, with “negative leakage”, for >90% allocation ratio at higher CO<sub>2</sub> prices

## 2b Reduce free allocations & move to benchmarks

Distortions occur also in other sectors:  
Blast furnace vs. electric arc steel production



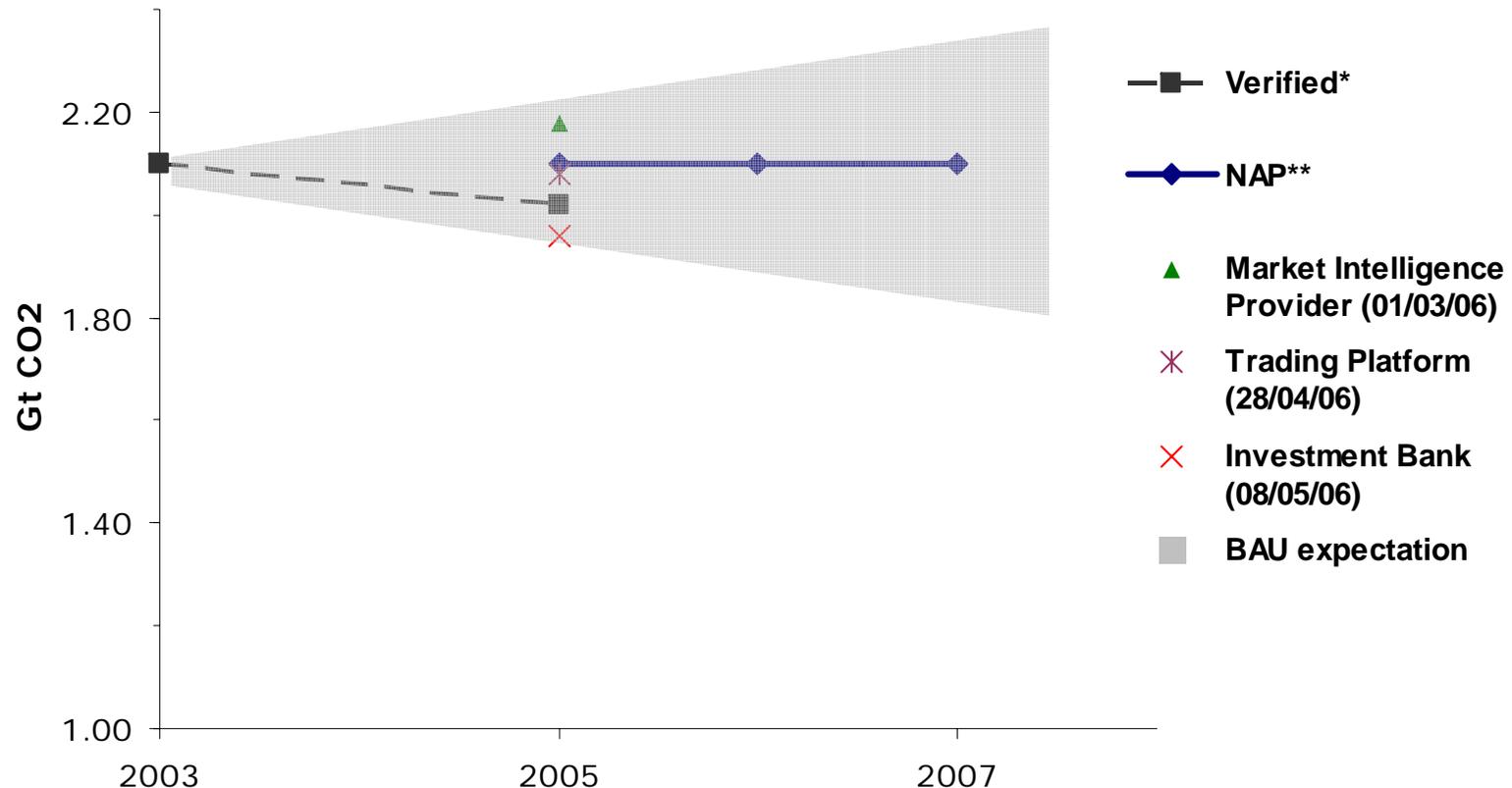
Integrated blast furnace by far the most carbon intensive.

But electric arc faces bigger cost deficit under grandfathered allocation.

# Uncertainty and the role of auctioning

# The price crash of Spring 2006 shows how small cutbacks with projection uncertainties carries potential for price volatility

- *Cutbacks were only about 1% below projected 'BaU'*
- *As late as March 06, major provider got "retrospective estimate" completely wrong*
- *Power sector emissions were focus of all cutbacks and shortages (tbc) – surplus in other sectors must be much bigger*

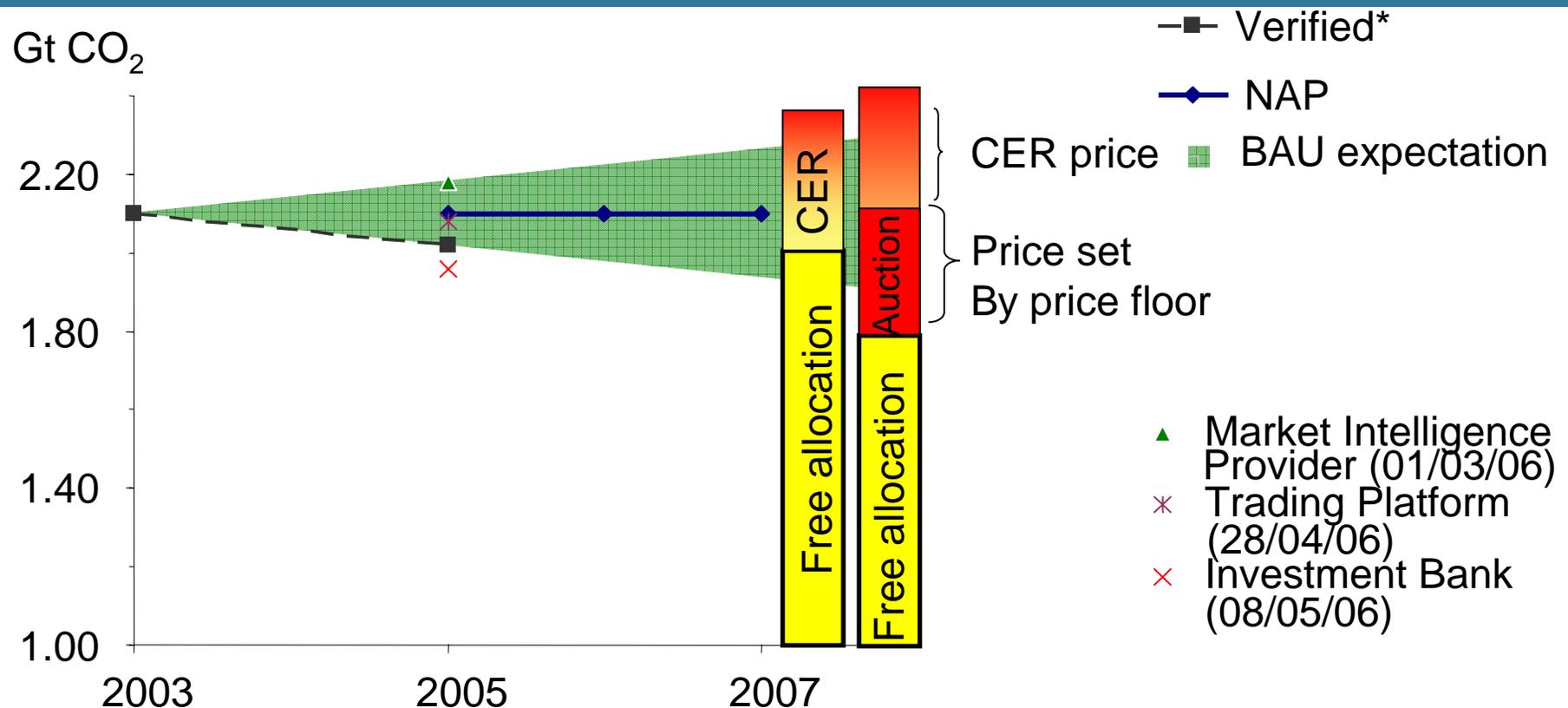


# Systematic upward bias in emission projections is to be expected and the empirical evidence is now overwhelming

- At least three factors explain upward bias in emission projections
  - Inherent optimism of macroeconomic and sector growth assumptions: no-one plans for or promotes the possibility of underperformance or failure
  - The 'gaming' incentives combined with asymmetric information between government and industry
  - 'You don't know what you don't know' in emission abatement possibilities: repeated evidence of 'awareness' effects in mitigation delivery
- The empirical evidence in is consistent and overwhelming
  - UK ETS
  - Climate Change Agreements
  - .. And now European-wide overallocation for 2005

## 1 Auctions for price stabilisation

Volatility unavoidable unless auctions used to give scope to adjust



Coordinated auction with price floor can set floor to allowance price

- Facilitates low carbon investment
- Reduces emissions and thus allowance price

\* Still incomplete data as of 5 June 2006

# In addition to the classic arguments, auctioning could help in the management of market power, allocation bias, price volatility and myopic behaviour

- Distributional distortions between companies
  - *Assume addressed through allocation negotiations*
- Potential intrinsic discrimination against new entrants
  - *Assume addressed through NERs*
- Potential of 'double dividend' gains in auctioning
  - We assume that auctioning is *not* used primarily for general budget revenues
- May result in illiquid or intransparent trading market
  - Liquidity and transparency likely to increase further in Phase II

Even if above discounted, auctioning may still offer following benefits:

- Offset strategic (market power) behaviour by integrated utilities
- *Manage price volatility in context of marginal cutbacks and uncertainty*
- *Hedge against information bias (and potentially reduce administrative costs) in allocation negotiations*
- *Avoid perverse signals from 'BaU' allocations (= > additional liquidity)*
- *Use revenues to offset 2<sup>nd</sup> phase transitional costs eg. in coastal cement*
- *Potential role in long term signalling*

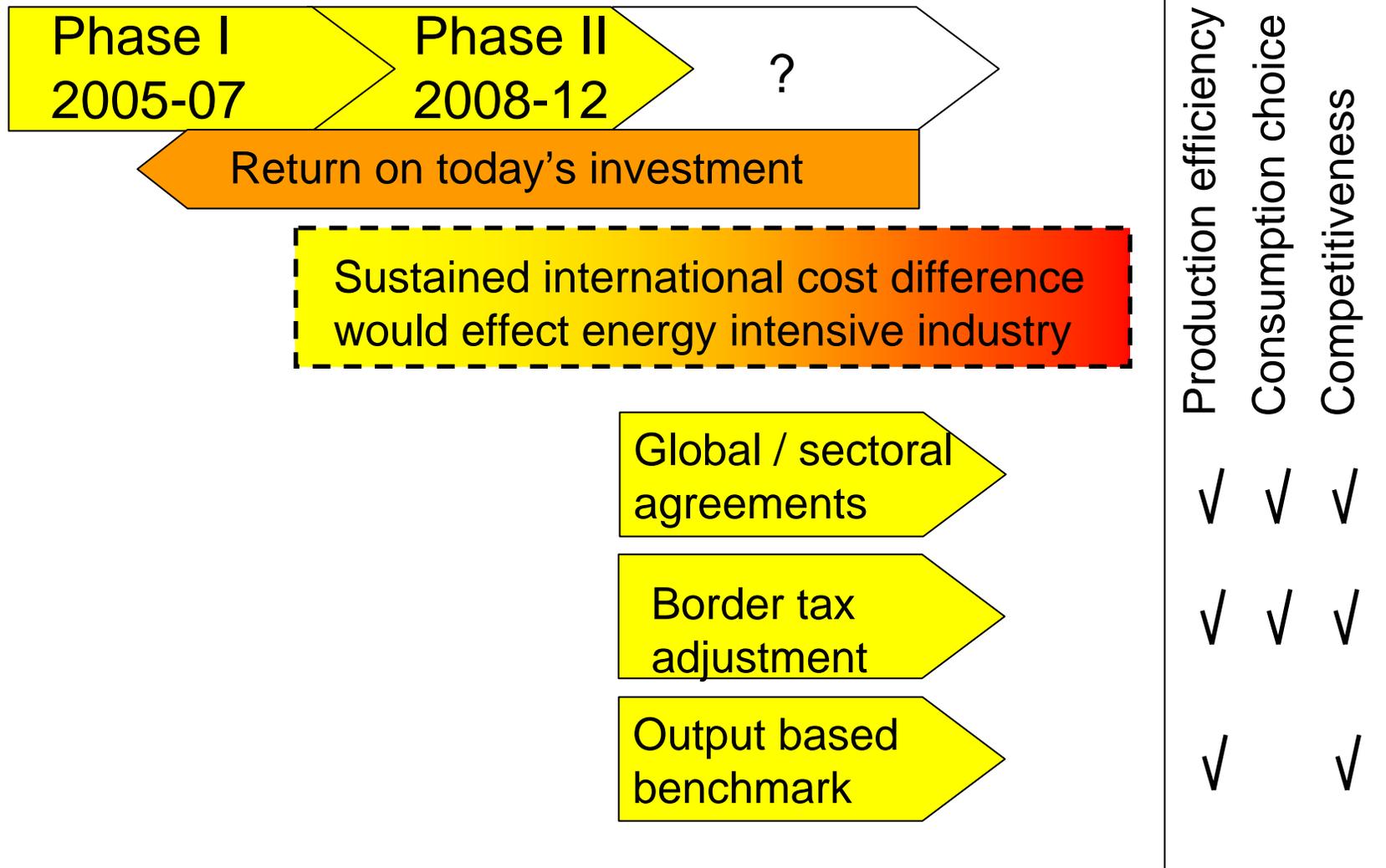
# Beyond 2012

# Looking beyond Phase II

- Without a clear sense of Phase III, the EU ETS becomes a short term incentive / cost for operational adjustment but not an investment driver
- Much of the attention on Phase III has surrounded 'additional sectors and gases'. Whilst important for the sectors concerned, this is a sideshow to the big picture. The EU ETS is designed for large energy-intensive facilities and is likely to remain so
- Active auctioning provides opportunity to seek the right balance between quantity- and price- signals, and open prospect for post-2012 price signalling
- But tackling climate change seriously will require higher carbon prices for some decades – making competitiveness a more genuine source of concern

### 3 Consistent post 2012 approach

Efficient response to the ETS requires clarity post-2012  
Expectation drives investment, detailed options determine competitiveness



# The EU ETS faces five broad structural scenarios/options for post-2012

<b>Option for post-2012</b>	<b>Comments</b>
(1) Embed "as is" in a comprehensive global agreement	The "first-best" – almost certainly unobtainable
(2) Embed "as is" in global sectoral agreements covering core exposed sectors	More credible in terms of "high politics" but institutionally wholly unprecedented – how to reach binding deal with global sectors? <i>Hybrid</i> with (1) could be explored
(3) Move to output-based and/or downstream allocations for core competitively exposed sectors	Removes core incentives related to product pricing & substitution and complicates system
(4) Sectoral protection through Border Tax Adjustment	Maintains core incentives but complicates trade and carries attendant risks of trade disputes
(5) Abandon the EU ETS	Disaster for EU credibility and for global efforts to tackle the problem

## There are now *four* official intergovernmental negotiation and dialogue processes

- The Kyoto Second Period negotiations launched at the Montreal Meeting of Parties to the Protocol (153 countries of which 32 are currently Annex B with a couple seeking to join)
- The UN global dialogue on future action launched at the Montreal Conference of Parties to the UNFCCC (c. 180 countries)
- The G8+5+? Dialogue that culminates in Japan in 2008 including the world's Big Emitters
- The Asia-Pacific Partnership on clean technologies including the A-P Big Emitters

# Headline recommendations (1): allocation approaches for 2008-12

- Where projections are used as basis of allocation (mostly energy-intensive consuming industries):
  - Cutback allocations by c.10% as hedge against projection inflation, auctions can reassure market of allowance availability
- Cut back the free allocations to power sector by more than other sectors, and:
  - Use benchmarking not historic emissions basis
  - Differentiated benchmarking for incumbents is reasonable, but
  - **Use undifferentiated benchmarking for new entrants with similar rules across Europe**

## (2) Auctioning should become a significant element in Phase II

- More efficient and helps to address State Aid concerns and reduce inherent distortions arising from free allocation
- Auctions can help to hedge against projection uncertainty
- Use periodic coordinated reserve-price auctions to help stabilise prices and form price expectations
- Use revenues also to address some specific distributional concerns and to support CO<sub>2</sub>-mitigation-related investments

## (3) Fundamental changes are needed for post 2012

- Investment security and efficient operation require EU governments to commit unambiguously to continuation of the EU ETS
- To be credible, design and allocation should be based upon joint exploration with other Kyoto Parties of the three contingent options in case of failure to achieve global participation:
  - Sectoral agreements covering all significant trade partners
  - Sector- and carbon-specific border tax adjustments
  - Output-based (intensity) allocation and downstream allocation

Present agreements *must not* commit to free allocations post-2012, phasing down free allocations as quickly as possible has several attractions ..

- Any present commitment to free allocations post-2012 risks undermining options post 2012
- Reducing free allocations rapidly
  - avoids perverse incentives based upon expectations or lobbying around future free allocations
  - Unambiguously rewards “early action”
  - Avoids State Aid concerns
  - Enables WTO-compatible border tax adjustments to protect competitiveness

With any free allocations, the pursuit of long-term objectives using instruments that have to adapt to shorter term cycles requires institutional independence

- Current allocation processes mix security of supply, secure industry support, and compensation for forgone profits
  - Political process with multiple objective creates complex NAPs
  - NAPs create perverse economic incentives
  - Investment delayed/distorted because future NAPs unpredictable
- Historically monetary policy had multiple objectives
  - Governments could not credibly commit to low inflation target as market knew employment and GDP growth are important
  - Therefore, they had to compromise more on GDP growth and employment to convince market of low inflation objective
  - Central banks now have one objective: control inflation
- **Use the next few years to establish institutional mechanisms analogous to national and European Central Banks, charged with prime goal of designing allocation to deliver emission goals with minimal distortion whilst compensating existing installations for distributional impacts**

## If Phase I was a trial, Phase II is a transitional period ...

- ... allows most participating sectors to profit and build up reserves to help fund low carbon adjustment
- Directive will need fundamental renegotiation for Phase III
- Renegotiation neither necessary nor possible for Phase II
- ... a period of intense analysis, development and negotiation with all long-term options "on the table"

This presentation draws upon extensive set of studies on allocation, incentives & competitiveness *including modelling of electricity and select product markets*

***Climate Strategies*** is a multi-client European research network, its EU ETS programme is directed by Michael Grubb at the *Carbon Trust* and looks at key issues around allocation *methods*, namely:

*Studies on electricity sector allocations coordinated through ICF Consulting:*

- Price pass-through & rent distribution between ETS participants
- Perverse incentives
- Legal dimensions

*Carbon Trust and CIRED studies:*

- Price, allocation and competitiveness: CT conclusions revisited
- Detailed study on EU cement market

*Scoping studies:*

- Drivers, roles and design for auctioning within ETS Phase II
- Possible roles of auctioning in price stabilisation and longer term expectations

*Published as Special Issue of Climate Policy Journal*

*Also Carbon Trust position paper. Launch 21 June 2006*