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CAMBRIDGE

The Future of ETS

Economic and Environmental Effectiveness

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Cambridge University

A project of the scientific network Climate Strategies

www.climate-strategies.org

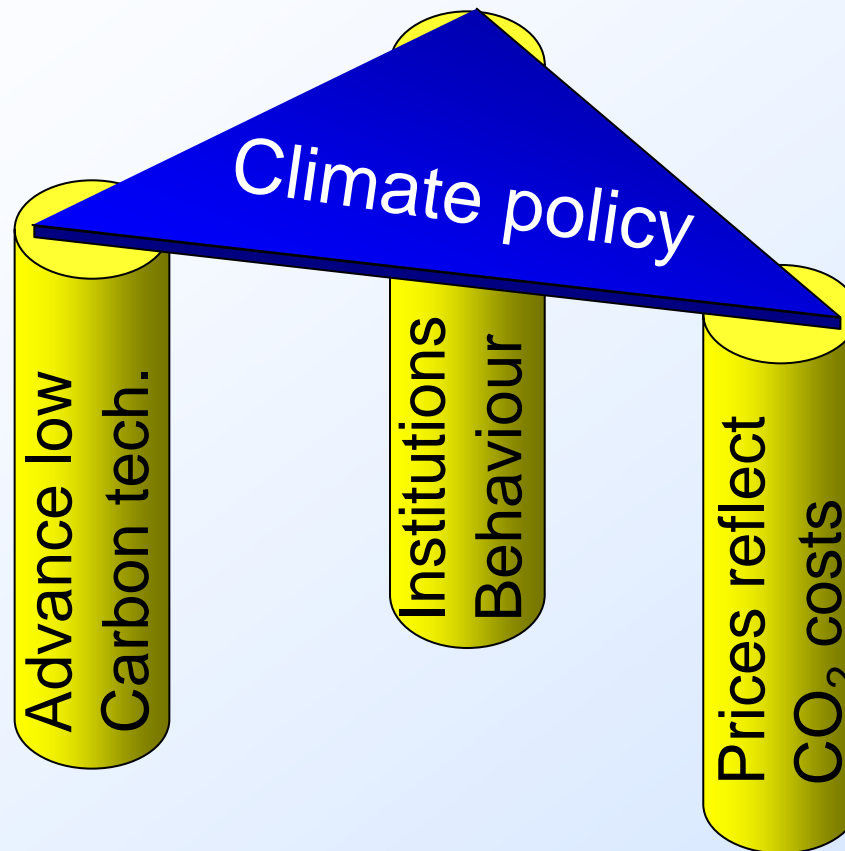
And the Electricity Policy Research Group, Cambridge University

www.electricitypolicy.org.uk

Future of ETS - Econ and Environmental Effectiveness

- The role of the European Emission trading scheme
- Challenge I – Distortions from allocation
 - and how can we avoid them
- Challenge II - Price stability
 - the role of auctions, contracts and consistency
- Challenge III - International competitiveness
 - Who is affected?
 - Possible perspectives and instruments
- Conclusions

ETS is an important pillar of our Climate Policy



- We can internalise CO₂ prices with emission trading or taxes
- Initial free allowance allocation facilitated introduction of ETS

And succeeds in internalising CO₂ prices

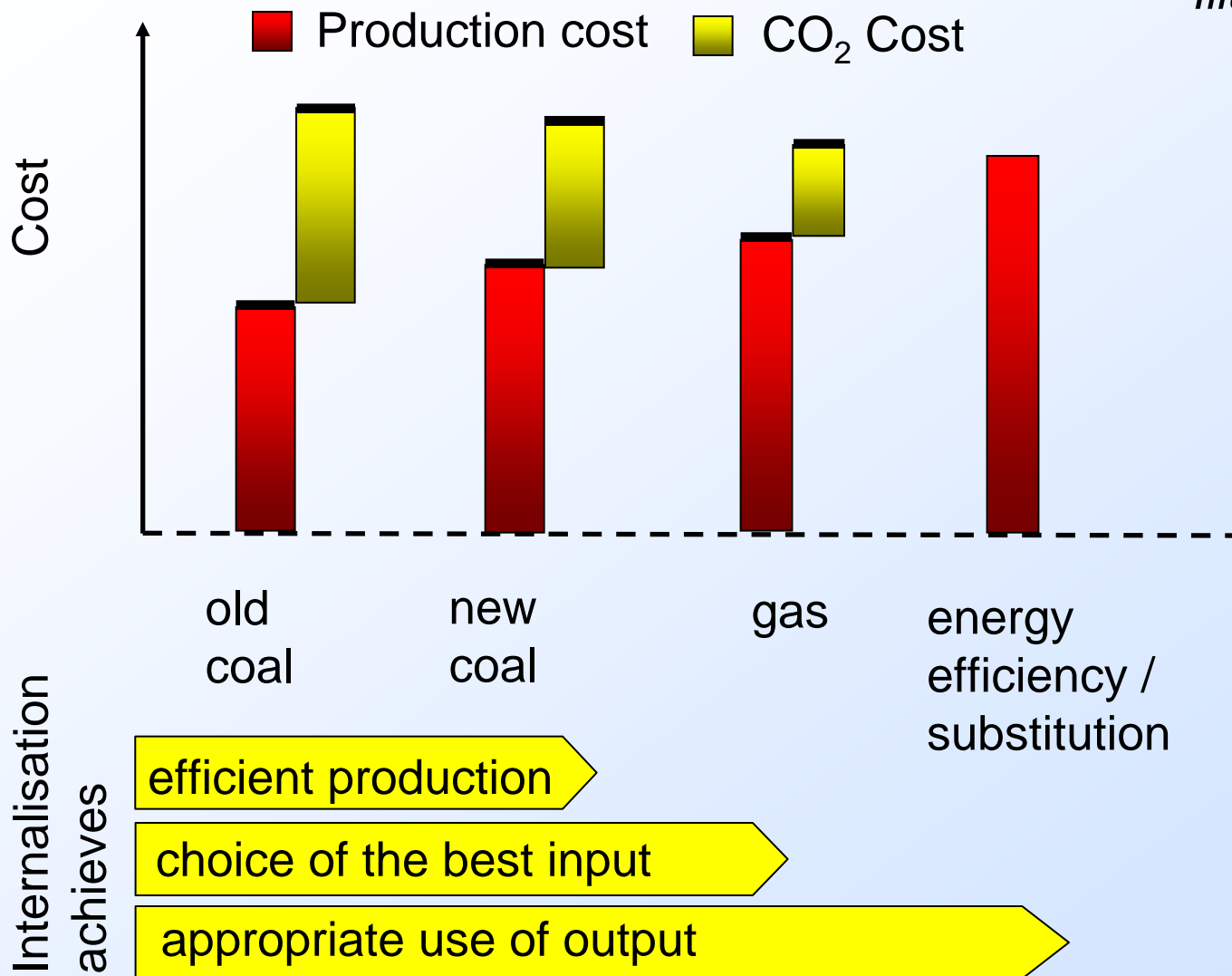
Example forward prices for electricity



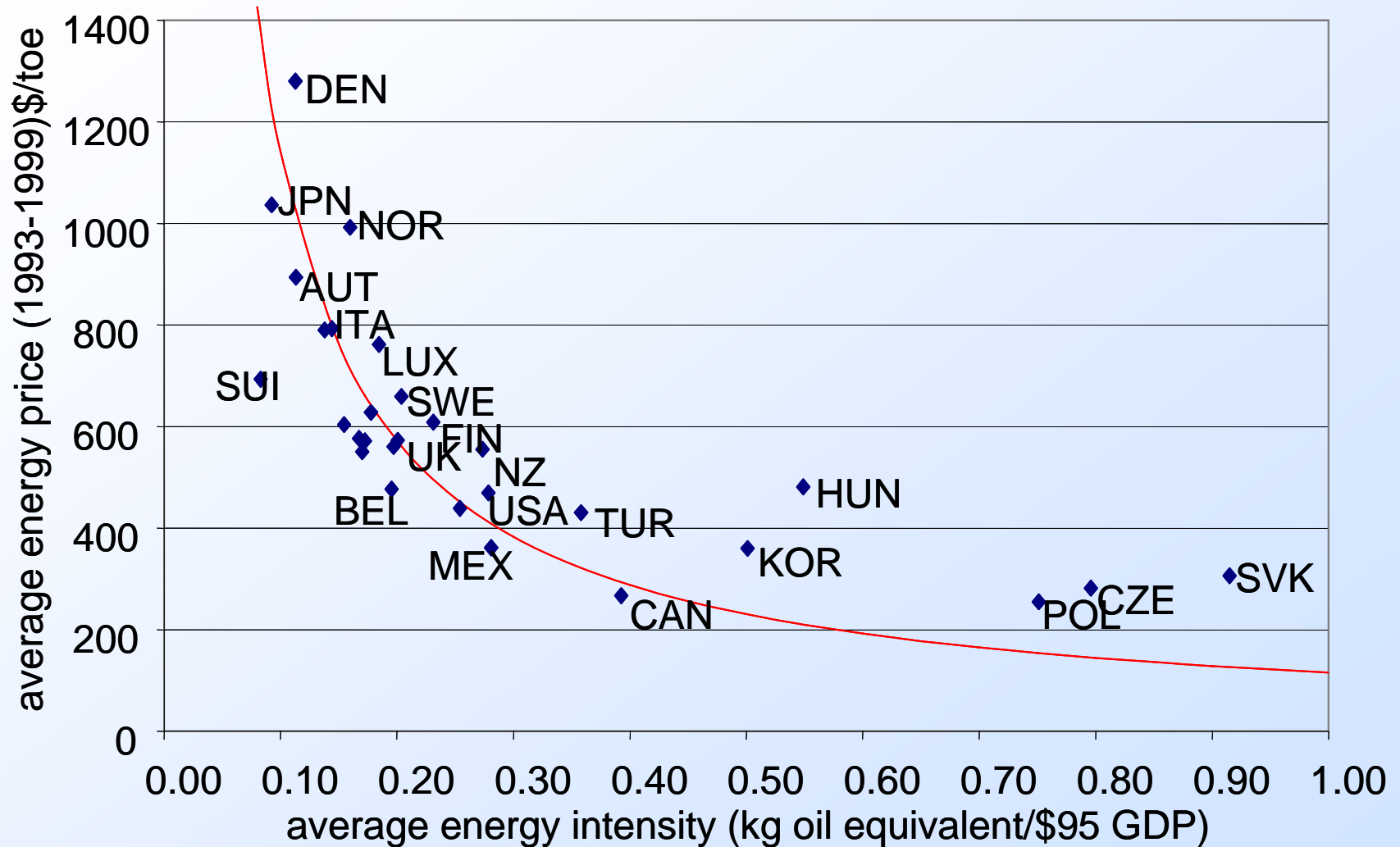
Source, www.eex.com, prepared by Alexandra Maratou

Why is it important to internalise CO₂ costs?

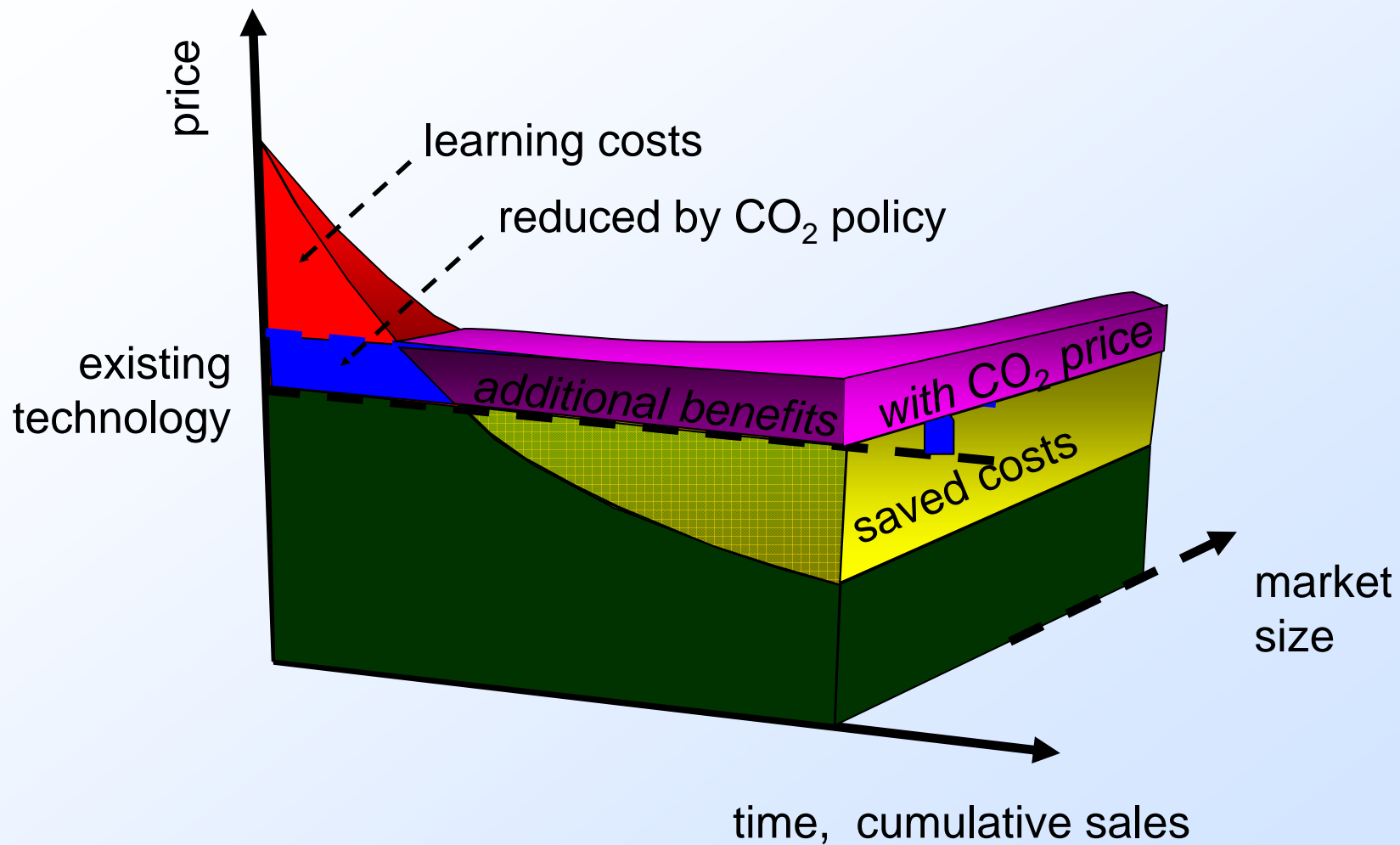
Illustrative



Cross country evidence: High energy price correlate with effective energy use



ETS complements technology policy

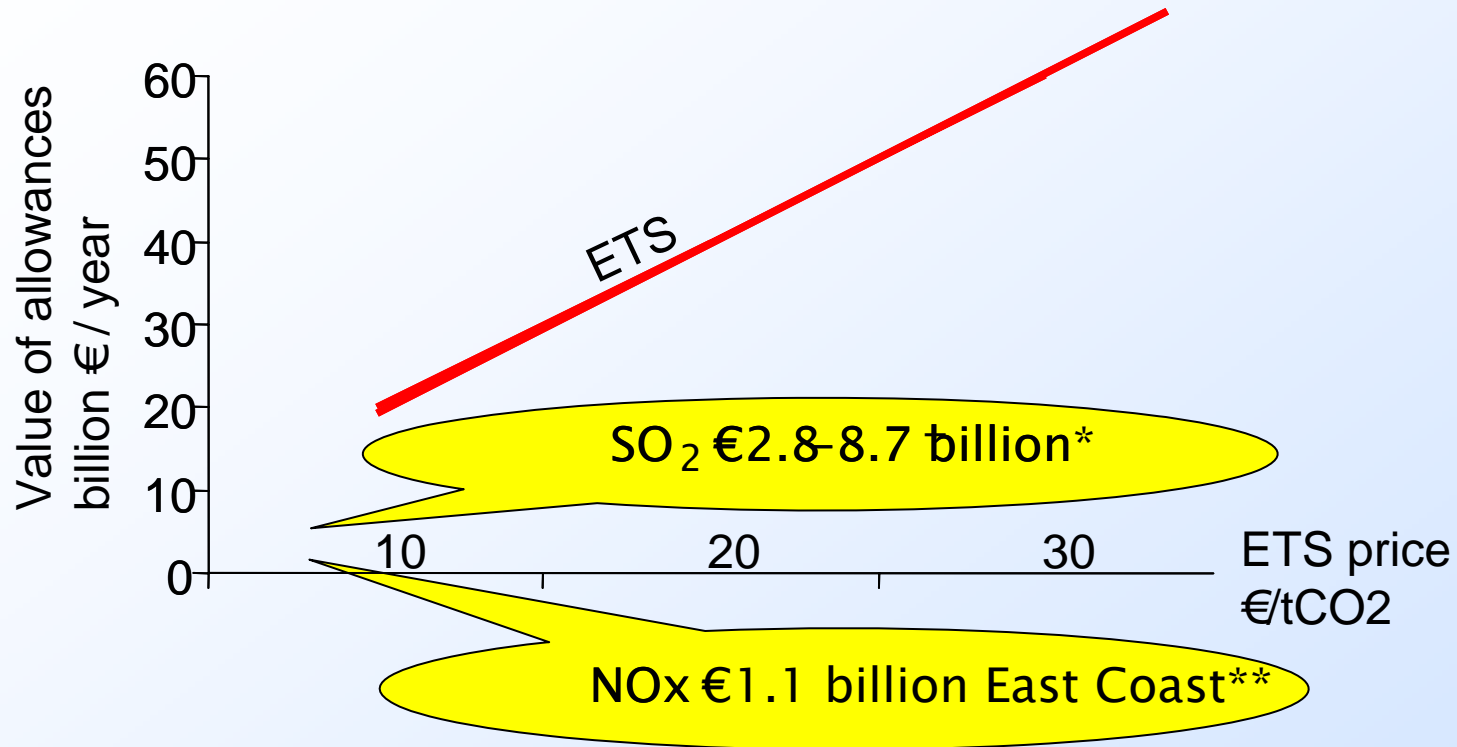


ETS is no substitute for technology policies (e.g. renewable support)

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Allocation matters, because EU ETS is worth billions



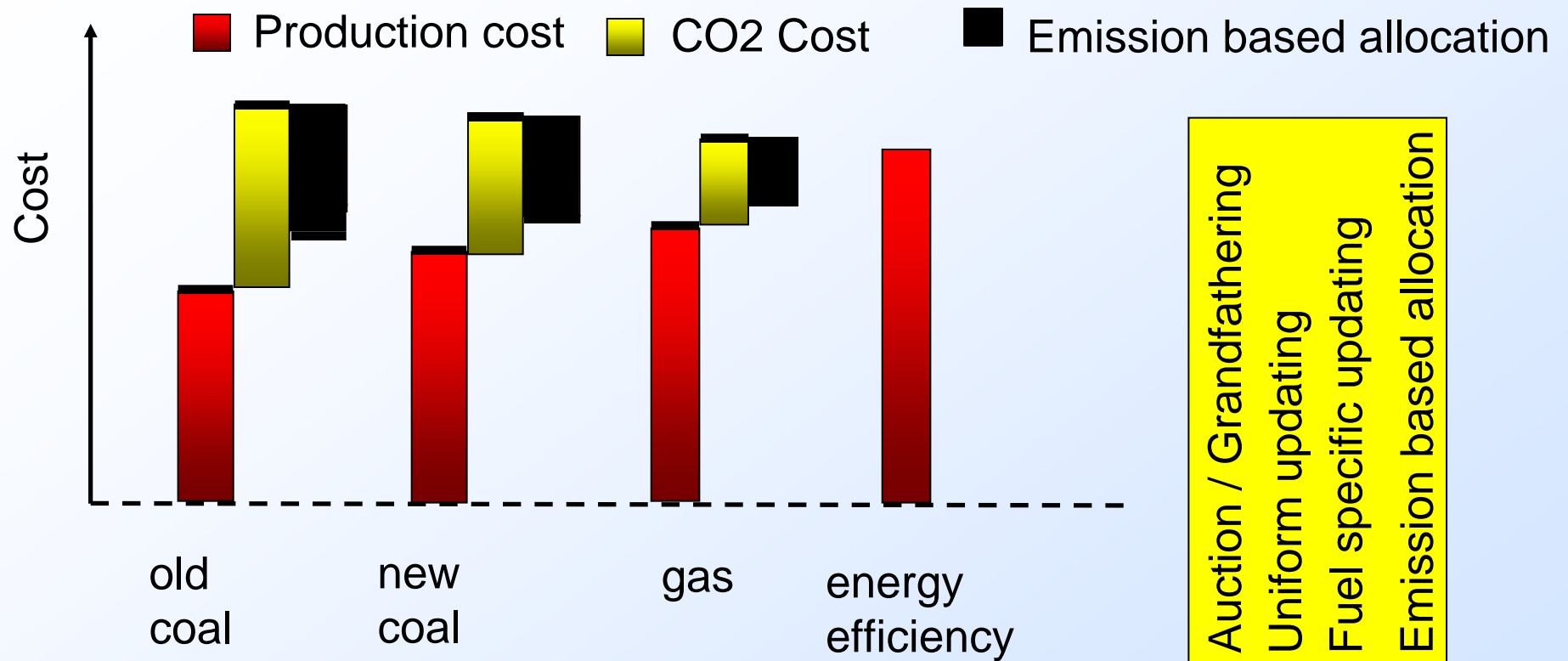
Money at stake drives firms' behaviour

* 10 mio t at 270-850 \$/short ton, ** 640 000t at 2000 \$/short ton

The multi period nature of ETS constrains options for effective allowance allocation

- Commitment periods of 3-5 years
 - Reflect growing scientific evidence
 - Increasing public awareness
 - Nature of international negotiations
- Create iterative regimes, with iterative allocation
- Governments not credible in committing to not using recent information

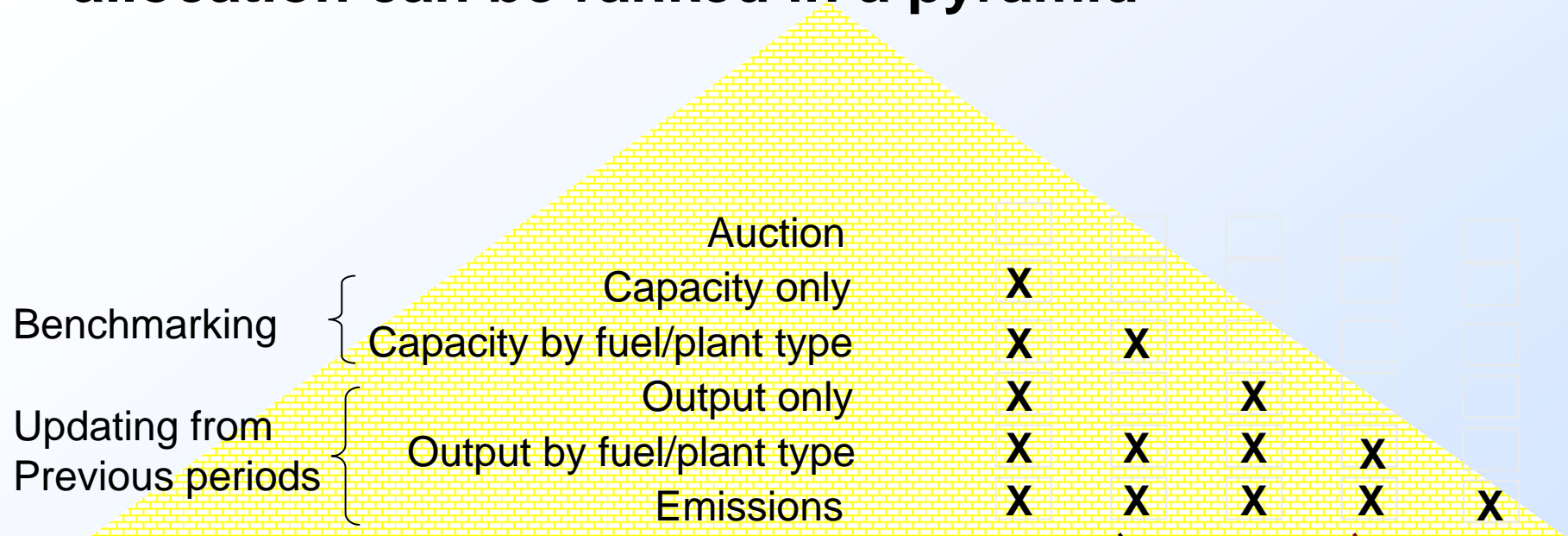
And the resulting allocation methods create distortions



- efficient production
- choice of the best input
- appropriate use of output

Auction / Grandfathering	✓	✓	✓
Uniform updating	✓	✓	
Fuel specific updating	✓		
Emission based allocation			

These distortions from repeated free allowance allocation can be ranked in a pyramid



Impacts

- Increased expenditure on extending plant-life
- Inefficient fuel choice
- Less efficiency improvements

Disincentive plant closure
 Distortion biased towards coal
 Shields output from average carbon cost
 Distortion biased towards coal
 Reduce incentives for efficiency-improving investment
 Efficiency-improving investment

State Aid rules might address these distortions and protect efficiency and thus competitiveness

- Free allocation involves an element of state aid
- Some aid may be justifiable (e.g. for environment reason)
- Proportionality principle seems important criteria
 - Free allocation to compensate for transition costs
- Allow temporary profits for industry (e.g. 2005-2012)
 - if countries show efforts (e.g. 10% auction 08-12)
 - and commit to phasing out free allocation post 2012

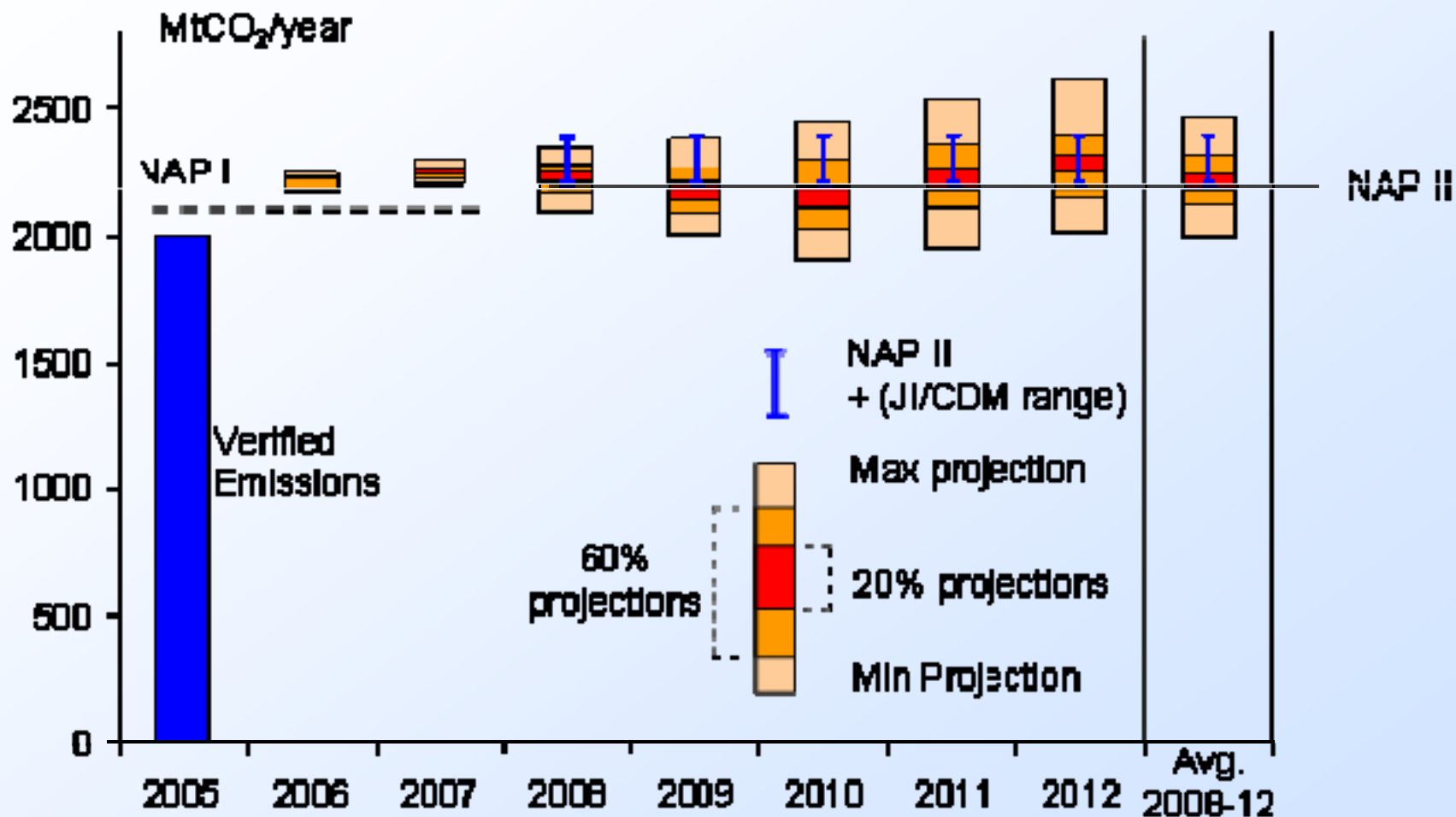
Summary free allowance allocation

- Repeated free allocation undermines ETS effectiveness
- Move towards auctions ensures efficient decisions on Investment, Operation and Consumption
- Don't abuse allowance allocation for other political objectives (subsidies generation investment, coal, ...)
 - Economic interactions too complex for policy process
 - Undermines credibility and thus effectiveness of ETS to deliver along any objective

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Projection uncertainty large relative to abatement



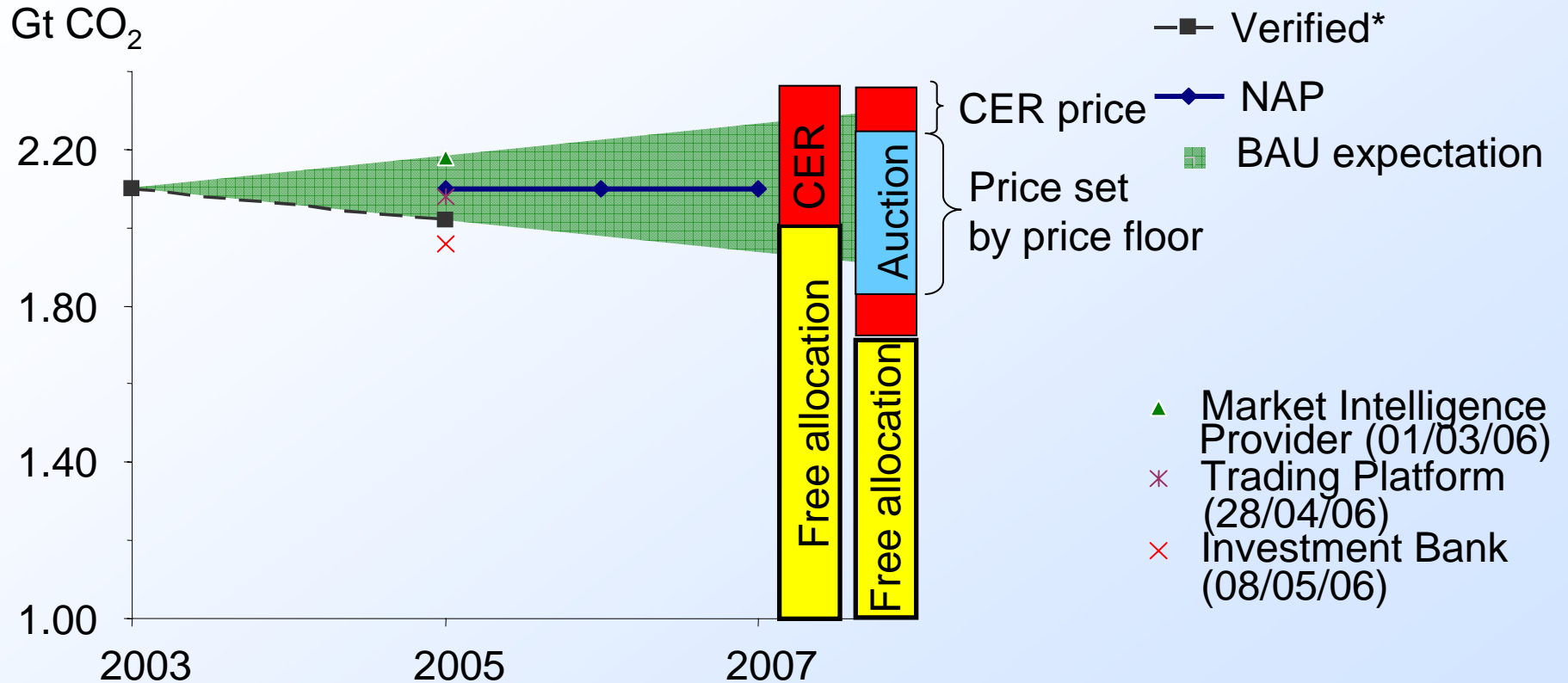
Source: Neuhoff, Ferrario, Grubb, Gabel, Keats (Sept 2006)

- Cap envisaged in NAP II too lax → expected price low → revisit NAP II
- Projections difficult – uncertainty about price likely to remain

Traditional approach for price stabilisation

- Normal commodity – use banking and borrowing:
 - Option to borrow might reduce incentive to act
 - Debt might drive future negotiation position
 - Links current price to uncertainty about future targets
 - Normal commodity – extend commitment period
 - Not credible, if future targets likely to change
 - Currency – ask central bank to stabilise
 - Creates financial exposure especially with gaming
- > all three approaches not really viable
- > But predictable prices desired, they drive investment

Set price floor in auctions to stabilise price



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

Auctions with price floor for price stabilisation

- Auctions are viable and simple option for allocation
- Directive allows for up to 10% auctions in 08-12
- We suggest to a coordinated auction with price floor
- Use complementarity criteria to limit CER inflows
 - if their price too low relative to desired price floor
- Some allowances from auctions will be required
 - thus they determine a price floor
- Price ceiling – difficult to align with Directive
 - price spikes unlikely given current projections
 - flexibility from CERs likely to prevent price spikes

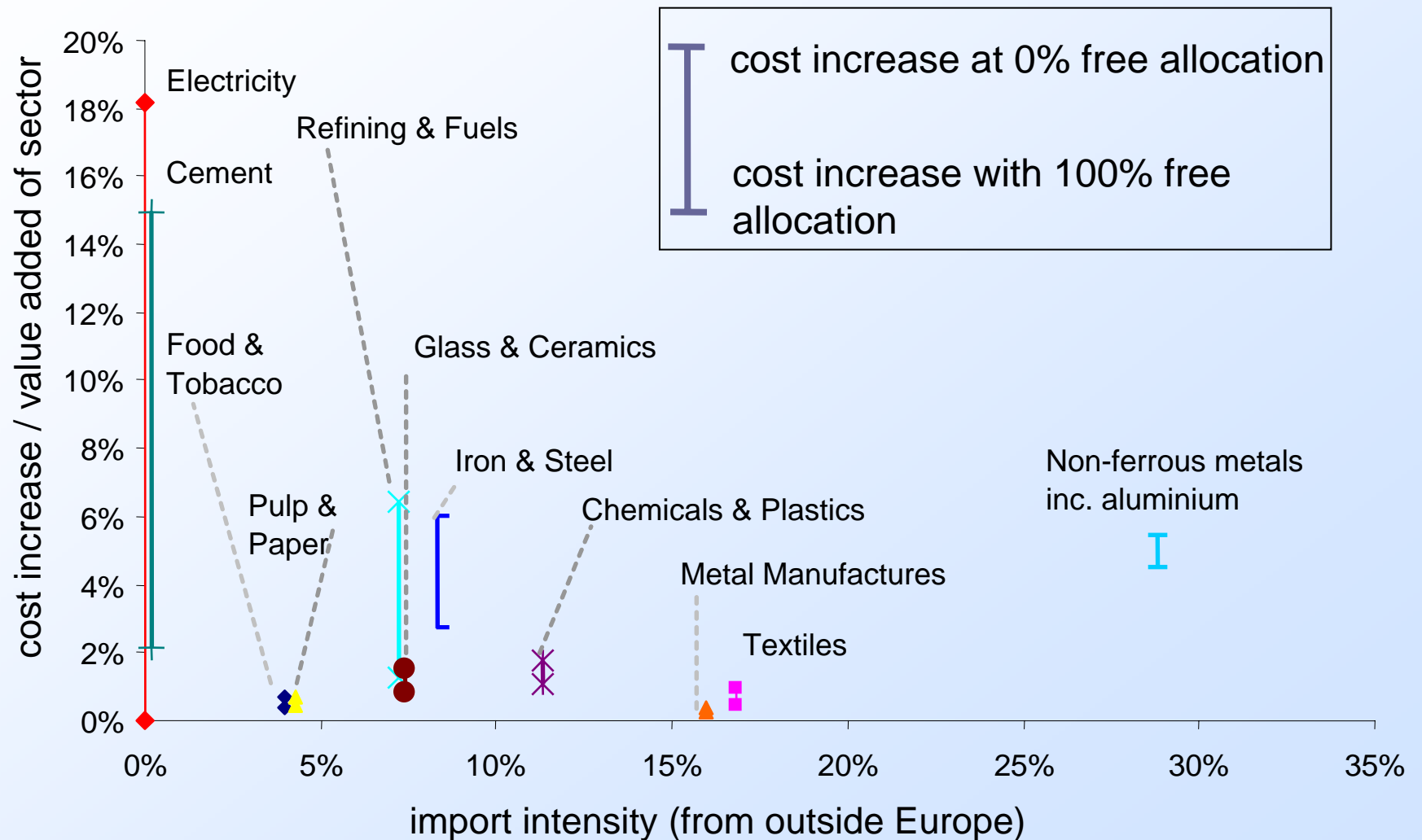
Option contracts on CO₂ for price stabilisation

- Governments sell option contracts to private parties
- Creates property right, strong enforceability
- Length corresponds to desired commitment, e.g. 15a
- Investors can call an option:
 - Hands in option + CO₂ allowance
 - receives strike price, e.g. 15 Euro/t CO₂
- Hedges investment, and also stabilises CO₂ price:
 - Investors will call options if $p_{\text{CO}_2} < 15 \text{ Euro/tCO}_2$
 - > Reduce supply, pushes up price
 - Governments avoid buying back allowances
 - > Restrict issuing allowances to retain scarcity price

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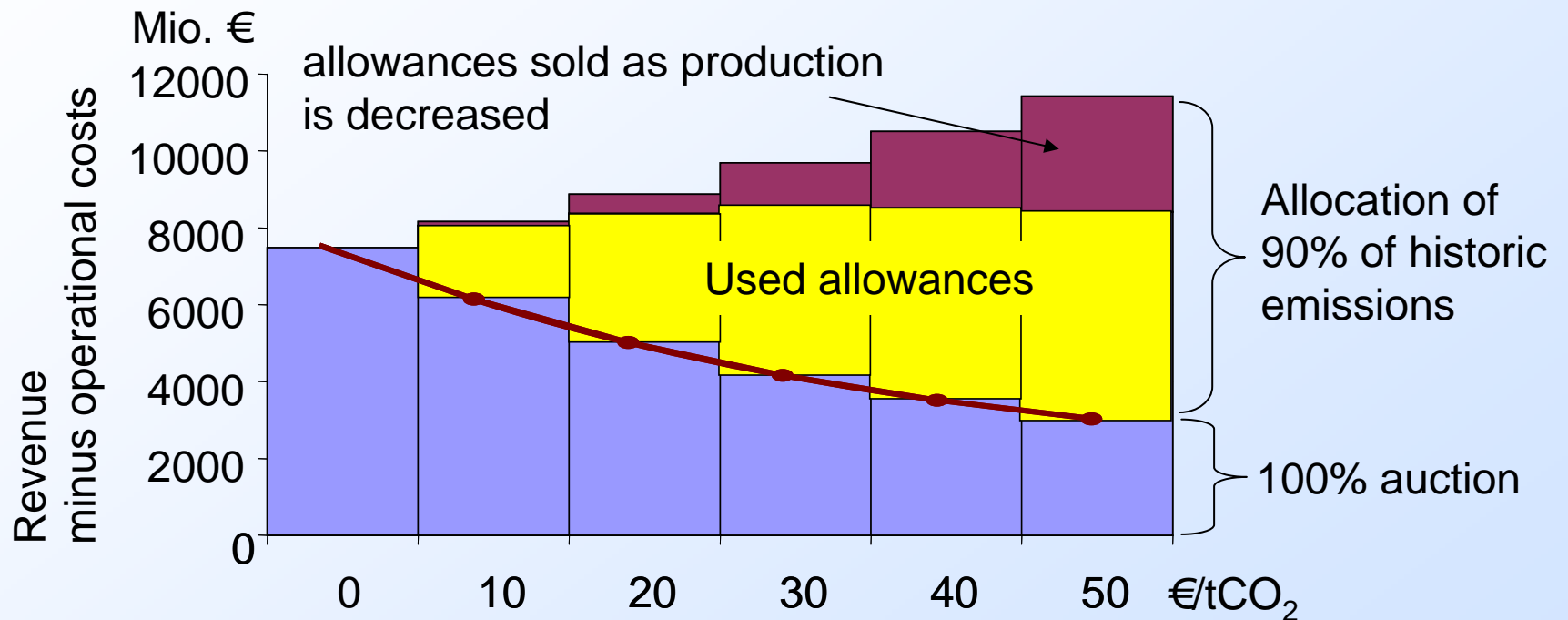
Emission trading affects competitiveness of few sectors



Assumption: UK, 15 €/tCO₂, 10 €/MWh

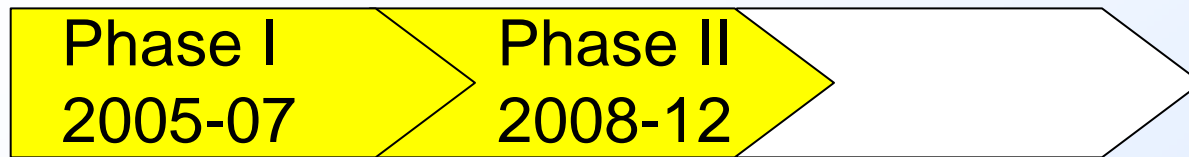
The current approach of free allocation shields profits, not the production of effected sectors

Example: Cournot model of the European cement sector



- energy intensive industry has usually high fixed costs
- relocating production is a strategic (long-term) decision
- competitiveness is affected by post 2012 perspective

Robust solutions for post 2012 exist



Continued international cost differences
effect energy intensive industry.

Global or sectoral
agreements

Compensation of
Exports/imports

Allocation pro-
portional to output

	Efficient production	Environmental costs reflected in price	Fair competition
Global or sectoral agreements	✓	✓	✓
Compensation of Exports/imports	✓	✓	✓
Allocation proportional to output	✓		✓

We will find the best solution in an international dialogue.

EU ETS faces five structural options for post-2012

Option for post-2012	Comments
(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

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Conclusions: Allocation for 2008-12



- Significant cut back of free allocations to power sector
 - To address state aid / distributional concerns
 - Shift to benchmarking not historic emissions basis
 - New entrants: undifferentiated, harmonised rules
- Modest cutback for other sectors
 - Induces participation, reduces perverse incentives
- Use flexibility of Directive and auction 10% of allowances
 - Floor price creates price stability and low carbon investment
 - Creates positive expectations about post 2012 price formation
- Do not commit now to allocation beyond 2012
 - Keep options open to address competitiveness post 2012

Conclusion: Design post-2012

- Credibility post 2012 requires consistent design
 - Effective, efficient and political sustainable
 - Address competitiveness by creating level playing field
- Exploration with other Kyoto Parties fallback options for global scheme
 - Sectoral agreements covering all significant trade partners
 - Sector- and carbon-specific border tax adjustments
 - Output-based (intensity) allocation and downstream allocation
- Phase out free allocation post 2012
 - Governments can't commit to ignore recent information
 - Repeated free allocation creates early action problem
 - Addresses state aid concerns
 - It is consistent with international options

EU ETS allocation and competitiveness

Papers available: www.electricitypolicy.org.uk

Allocation and competitiveness in the EU Emissions Trading System: policy overview	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