IMPLEMENTING CARBON PRICING

In a world of political resistance and evolving international participation

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and Grattan Institute
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Outline

- The Age of Innocence
- Nature of the challenge and the emerging divide
- The policy triad
- Carbon pricing and politics: lessons from the EU and other developments

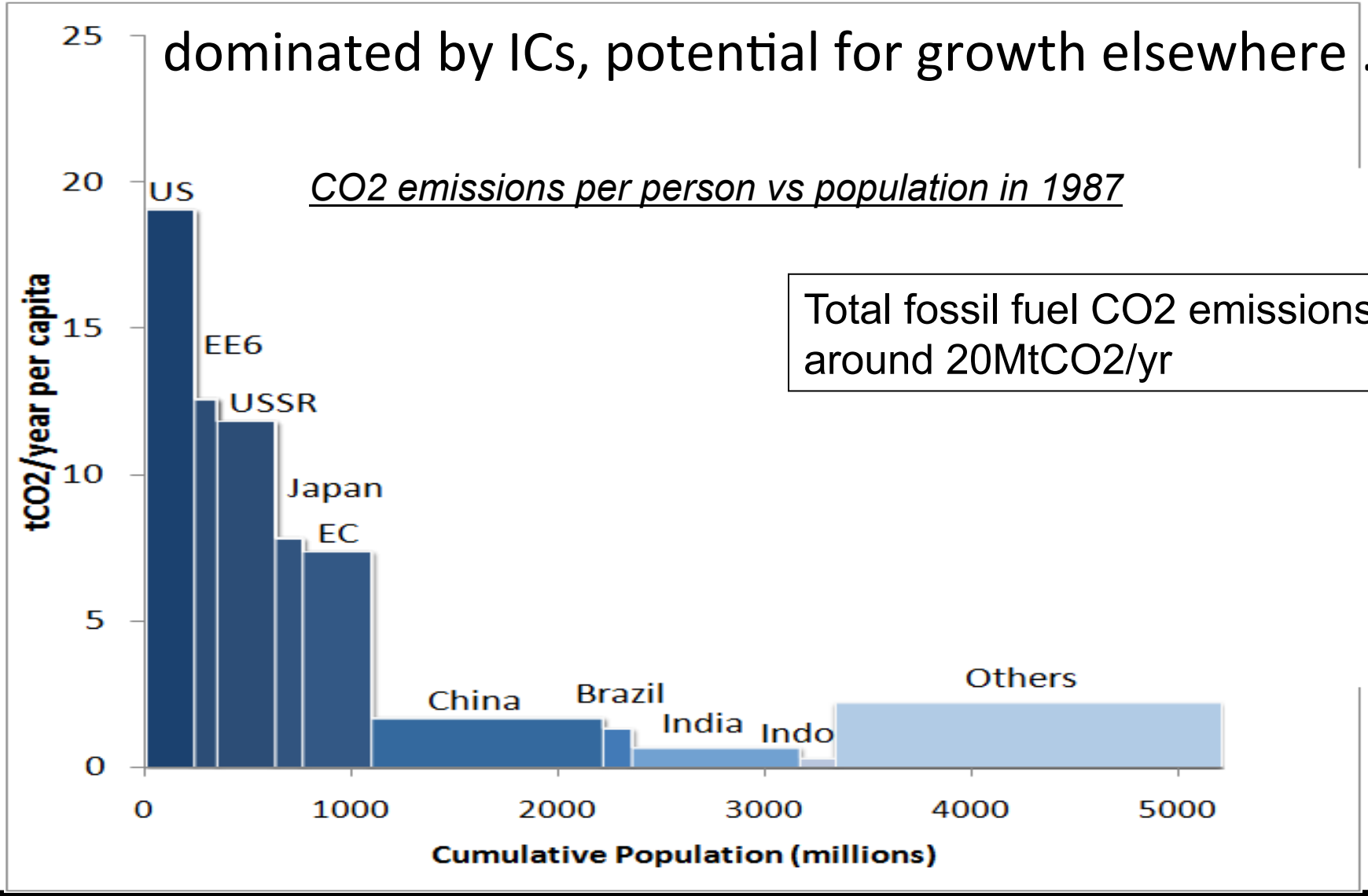
The Age of Innocence:

from victories over OPEC & communism to financial crisis

- Remember "The End of History"?
- Western dominance based on belief that markets could solve all problems – including resource and environment
- Astonishing neglect of the emerging economies and their significance for global resource, economy and geopolitics
- Debt-based growth:
  - Finance
  - Easy oil
  - Atmosphere

Energy & emissions in 1980s

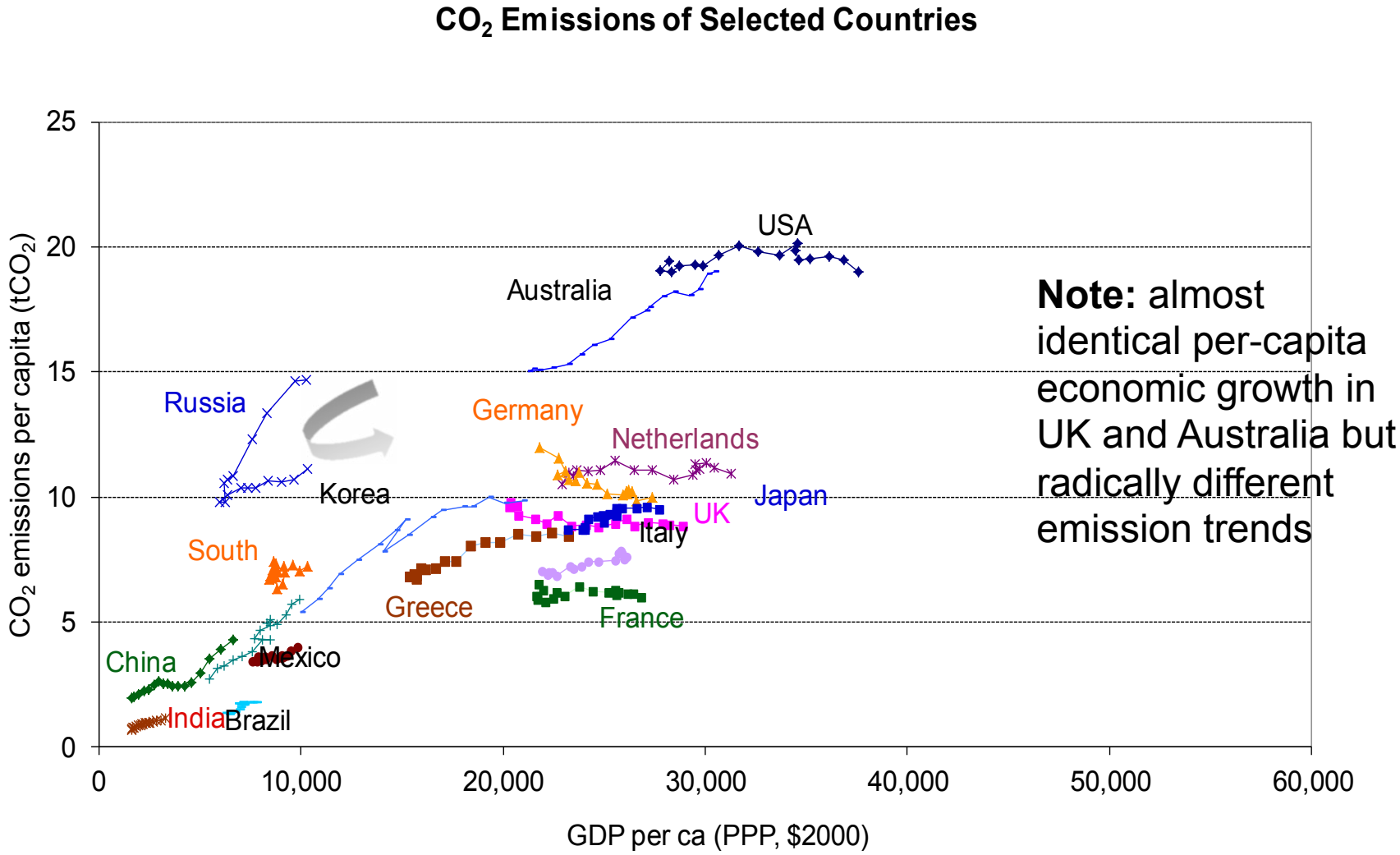
dominated by ICs, potential for growth elsewhere ..



Total fossil fuel CO2 emissions around 20MtCO2/yr

Per-capita emissions of industrialised countries *are not converging*

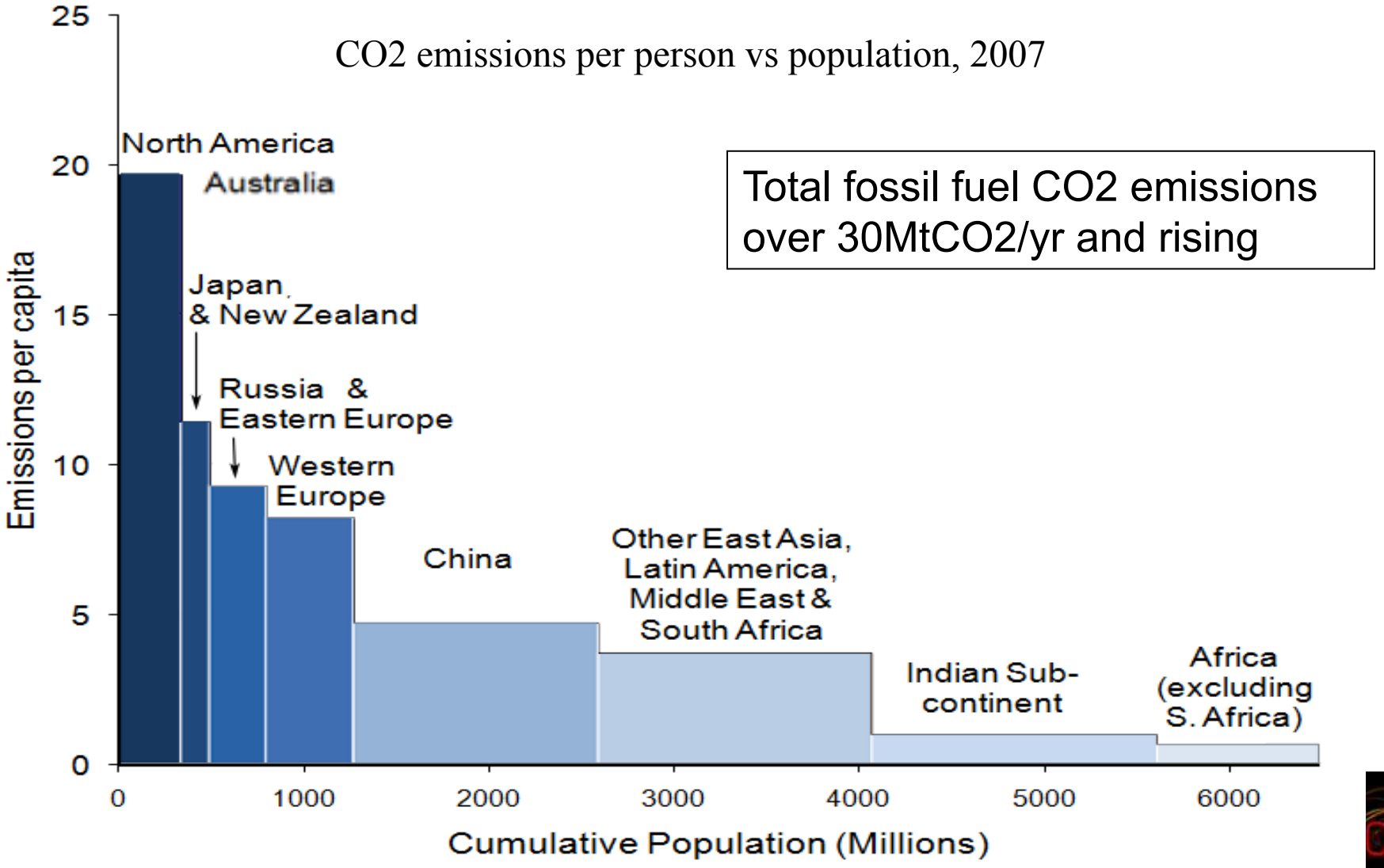
- Rather we see the emergence of two groups, whilst developing countries catch up



Twenty years on, landscape changed …

Extraordinary growth of China & emerging economies

+ mostly stable per-capita emissions in ICs



Total fossil fuel CO2 emissions over 30MtCO2/yr and rising

Key beliefs of the Age

on international energy & climate policy

- Essentially a problem of sharing costs
  - *Actually about decisions on policy, investment, risks and returns driven more by politics than by economics*
- Led by the industrialised world with others following
  - *Actually fractured action with emerging economies accelerating*
- Energy efficiency is an easy 'free lunch'
  - *Good for the economy but not simple*
- Carbon price obvious way to drive low carbon investment
  - *Actually very tough and has a much more complex role*
- Technology will save us!
  - *Innovation is a **result** of good policy, hard to force efficiently and slow to emerge*

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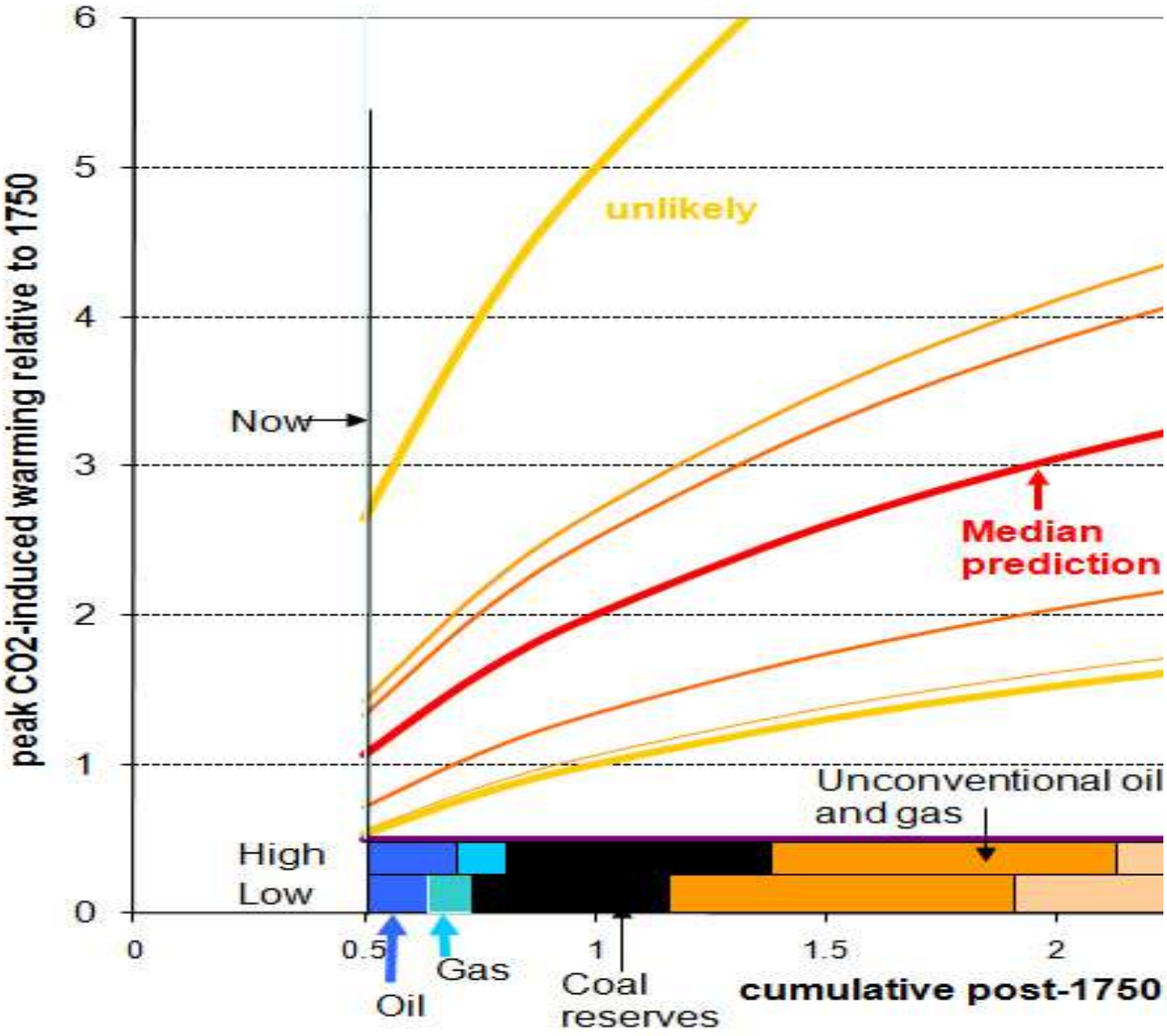
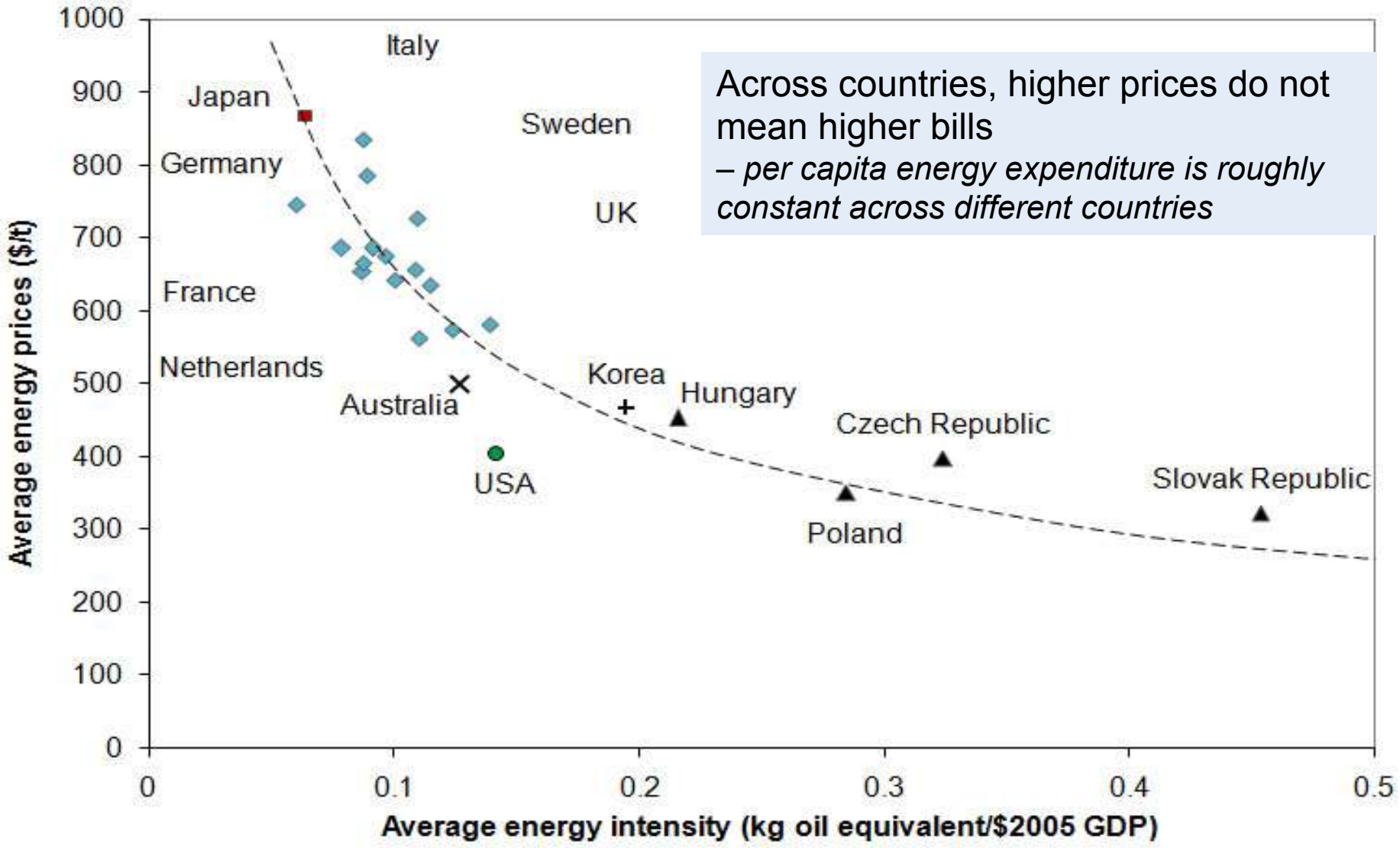
Nature of the problem: Global temperature changes, emissions and fossil fuel resources: projections and uncertainties



- Temperature change determined by *cumulative* CO2 emissions
- 'Best guess 2 deg.C' target equates to total 1000MtCO2 of which half is already emitted
- .. next 500MtCO2 bigger than remaining oil and gas *economic reserves*
- More emissions disproportionately raise risk of high temps

Energy & carbon productivity relates closely to energy prices

- The evidence suggests that countries adjust given time

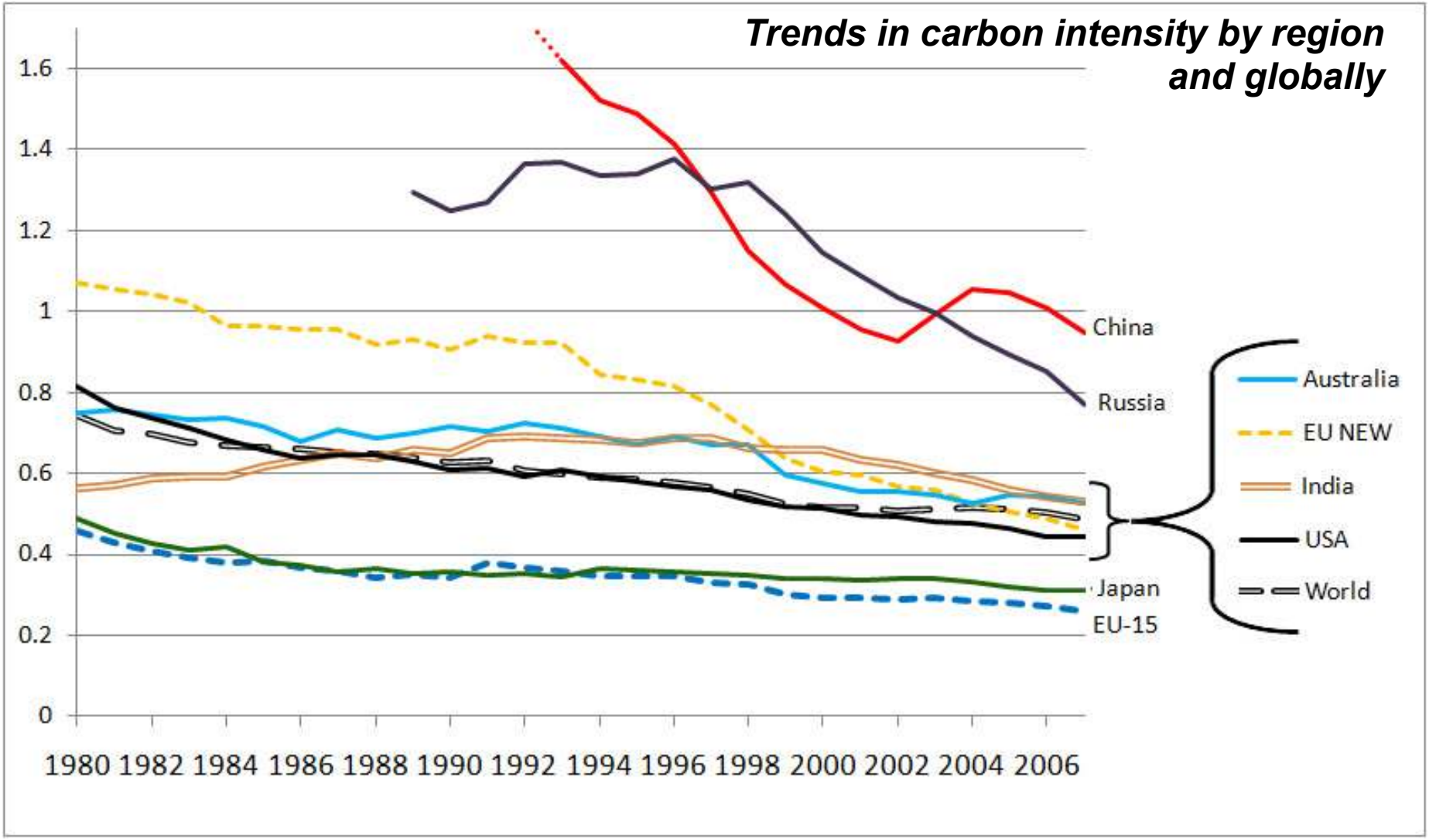


Across countries, higher prices do not mean higher bills

– per capita energy expenditure is roughly constant across different countries

Carbon productivity improving, highest in countries with Kyoto caps

- EU-15 edging ahead of Japan, new Member States progressing

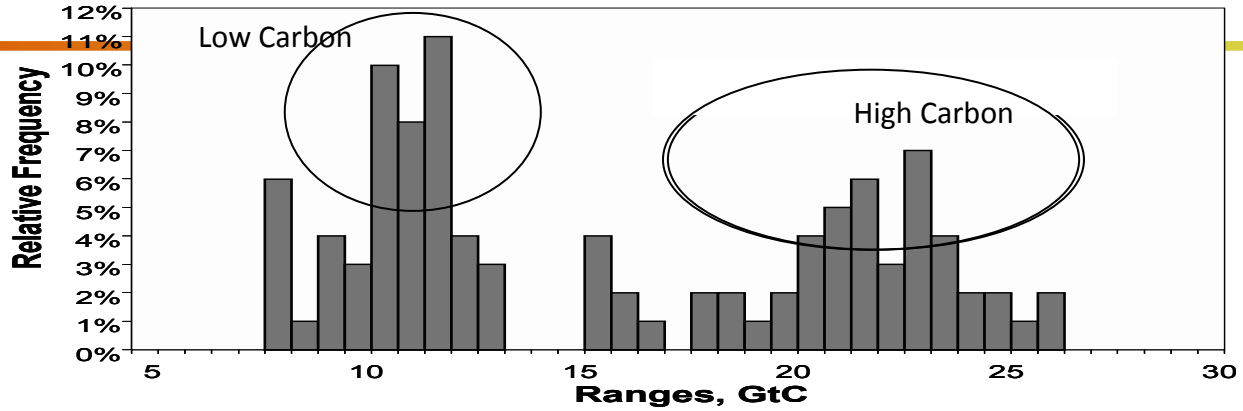


Who's acting?

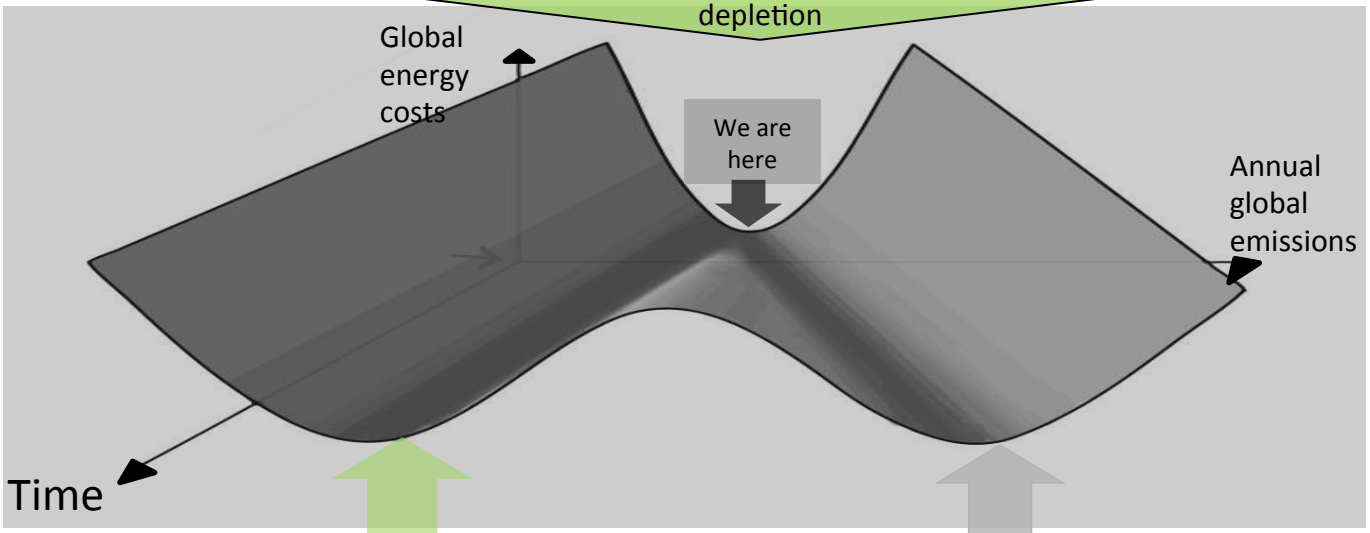
- EU, California, Brazil, clearly moving to foster low carbon economy
- Korea 'green growth' package, India shifting to low carbon development trajectory (PAT trading scheme) … probably China too (low carbon development zones, five year plan)
- Energy/carbon pricing an essential part of the strategy in Europe, renewables core in Brazil and EU and emergent in Asia
- .. And the common theme is … *fossil fuel importers*

Two kinds of energy futures divide on the ridge of oil depletion

Number of potential energy futures near 'minimum' cost



The clustering of 'low cost' energy futures around higher and lower emission levels, rather than in the middle, reflects the fundamental options in the face of oil depletion



Low carbon futures

- High efficiency
- Low-carbon electricity

Cost

High **Capital** Low

Low **Fuel** High

High carbon futures

- Continued dependence on fossil fuels
- Unconventional & synthetic oil in transport

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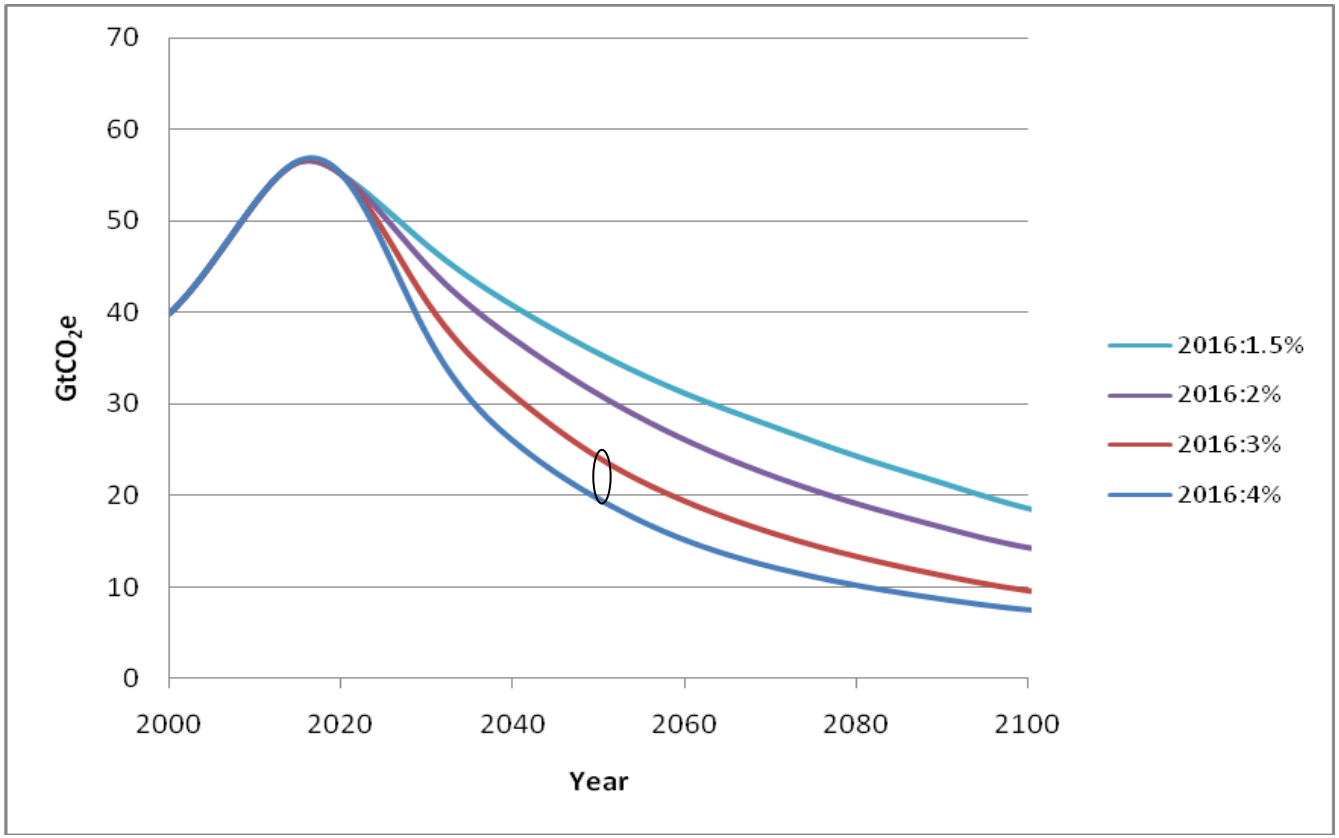
Required global emissions reduction



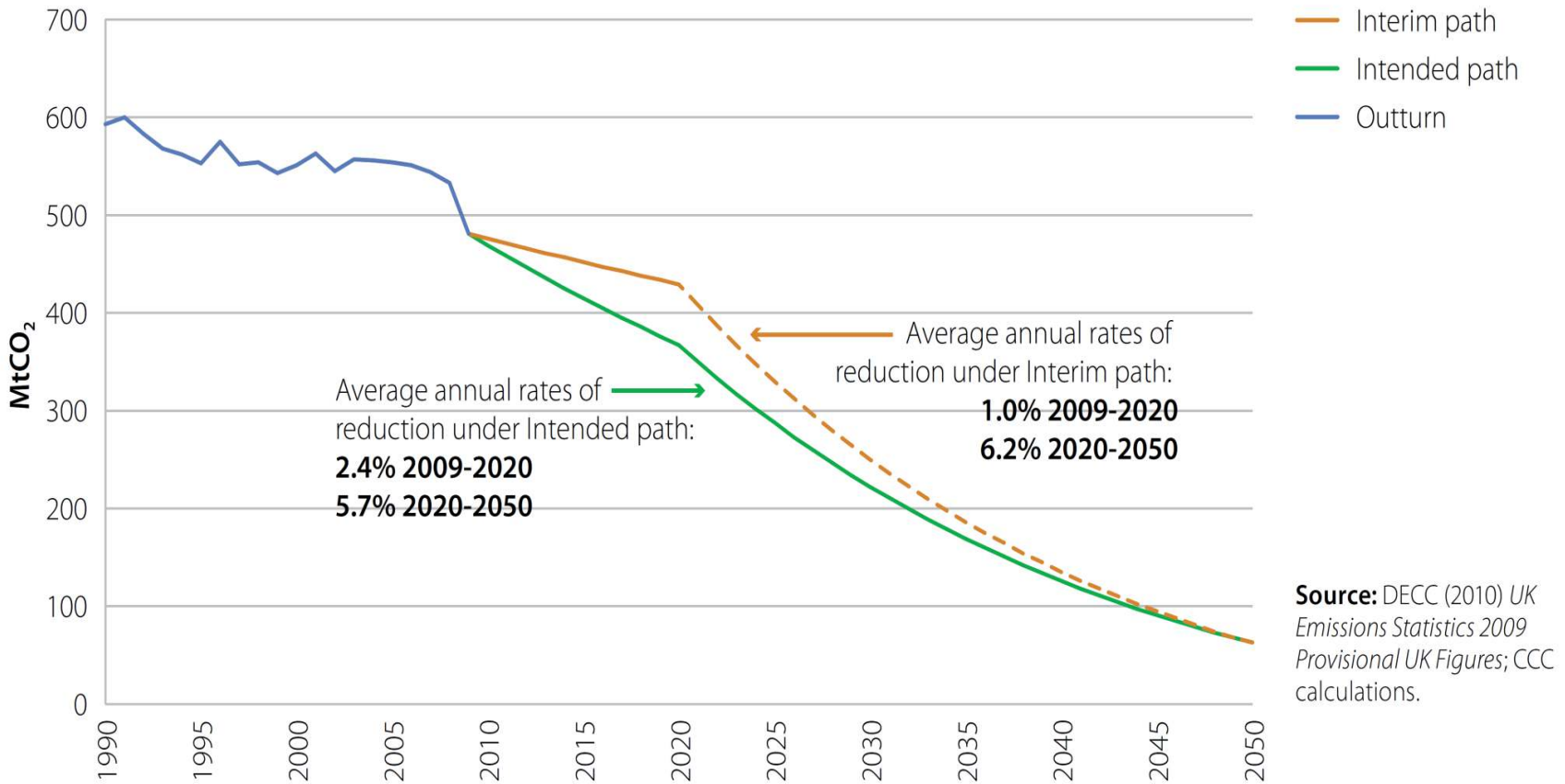
G-8 target + low subsequent trajectory achieves:

- around 500ppmCO2e, 2060-2200
- 65% prob < 2 deg. C
- c. 90% prob < 3 deg. C
- v. high prob < 4 deg. C

Possible future global emissions trajectories for Kyoto greenhouse gases. All peak in 2016 and then reduce total CO_2 emissions (including those relating to land-use) by 1.5, 2, 3 or 4% annually. For further information, see Technical Appendix.

Cost-effectiveness needs consistent pathway to 2050

Figure 10: CO_2 emissions reduction to 2050 under Interim and Intended budgets



Source: DECC (2010) *UK Emissions Statistics 2009 Provisional UK Figures*; CCC calculations.

Source: UK Climate Change Committee, 'The Fourth Carbon Budget', Dec 2010

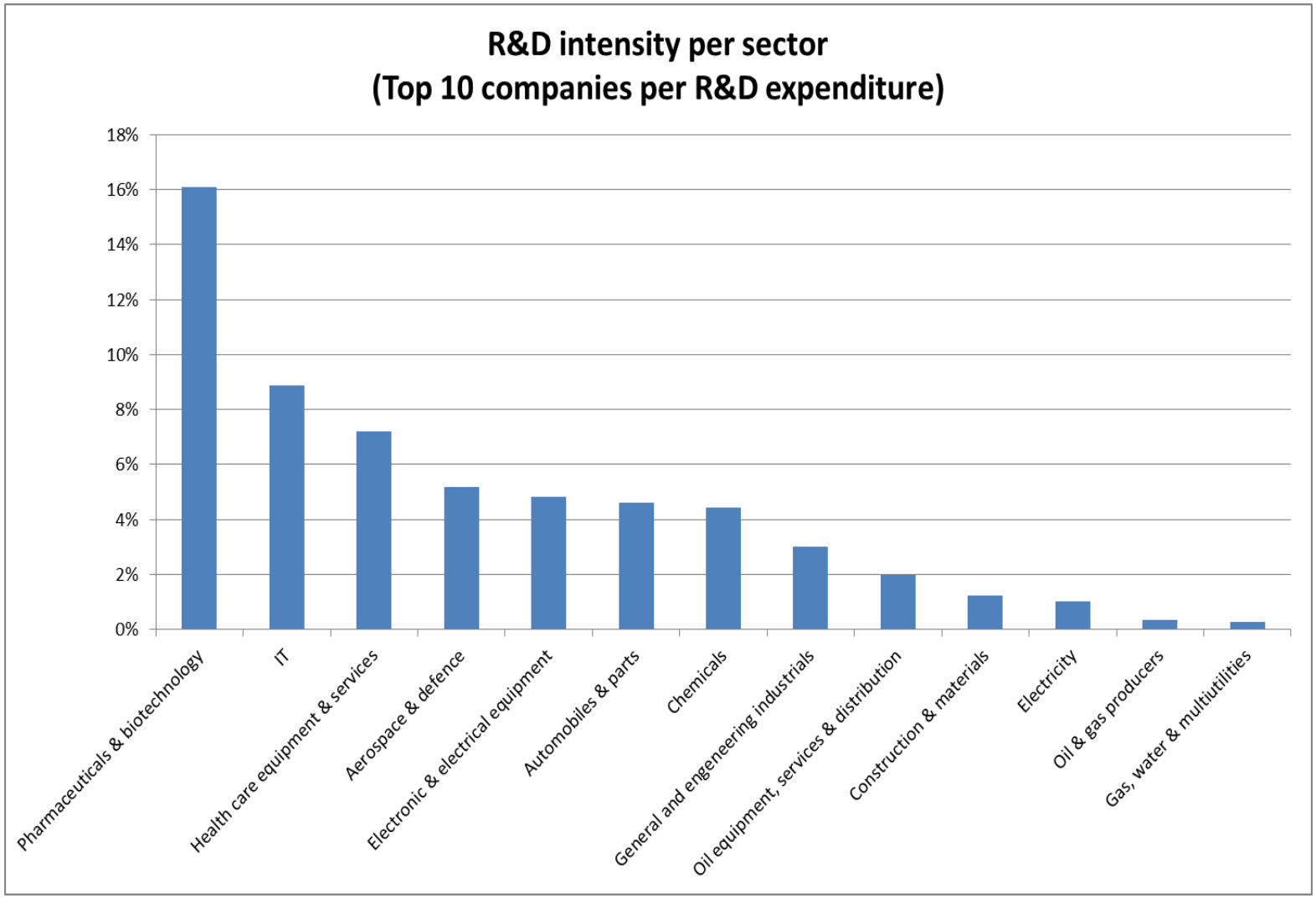
Time horizons of different challenges

match against different response timescales & theories

Timescale	Response	Analytic principles
Short term	Energy efficiency and 'no regrets'	'Behavioural economics' (eg. barrier, transaction, psychology & satisficing theories)
Years to decades	Substitute low for high carbon investments	Classical economics
Long term (several decades)	Innovation and infrastructure investment	Evolutionary economics (eg. endogenous growth theories, learning-by-doing and scale economies, complexity theories)

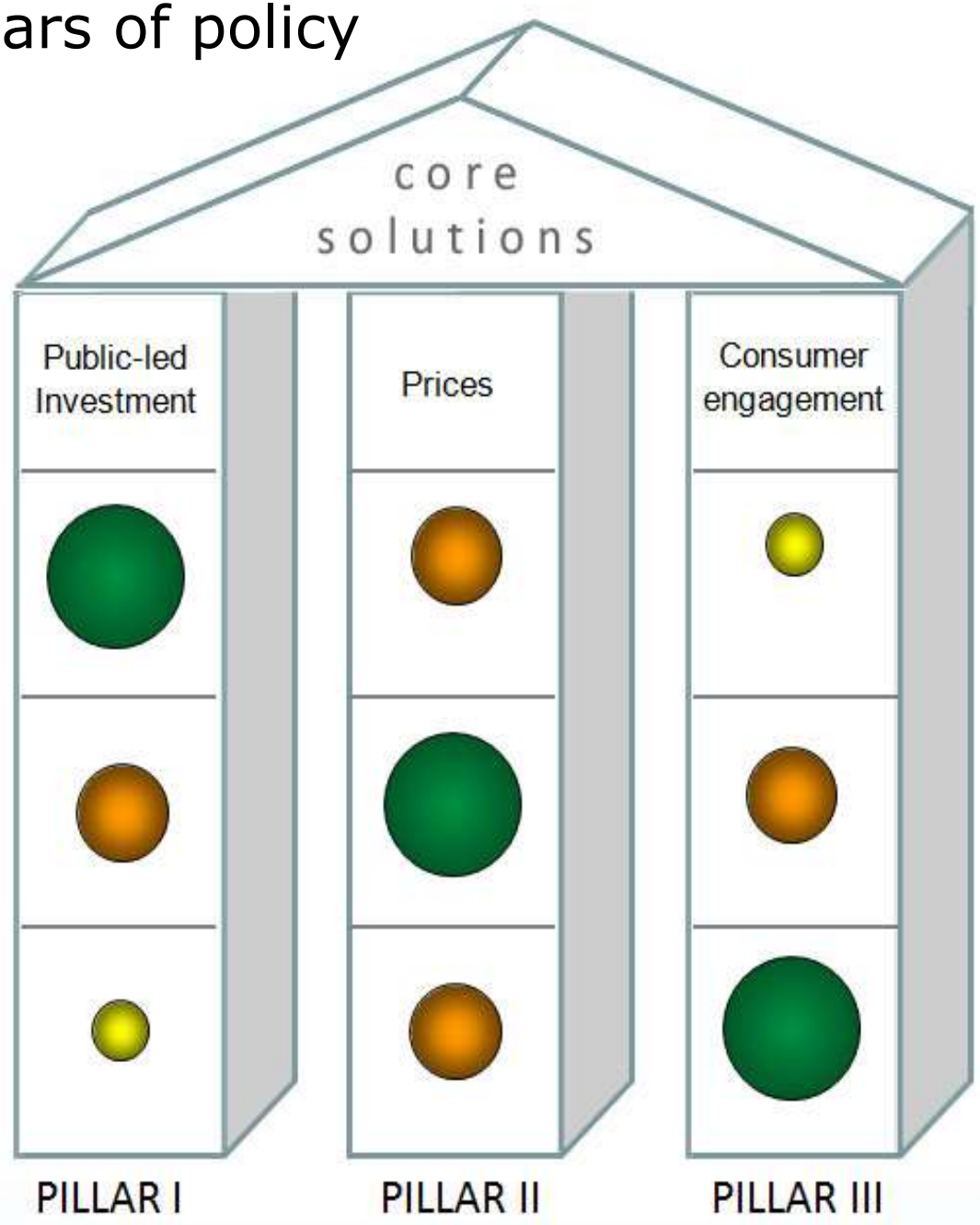
Classical economics implies there is a least-cost optimum
The others do not, and indeed suggest that 'laissez faire' is most unlikely to be optimal

We are seeking radical innovation in some of the least innovative sectors of our economies



The three pillars of policy

Response	‘Economic’ analytic basis
Innovation and infrastructure investment	Evolutionary economics
Substitute low for high carbon investments	Classical economics
Energy efficiency and ‘no regrets’	‘Behavioural economics’ (eg. barrier, transaction, psychology & satisficing theories)



The three types of response form *an interlocking triad,* linking *different actors with different characteristics*

Behavioural mode	Public-led investments	Prices	Consumer & voter behaviour
'Secure'	Innovation,infrastructure @ public discount rates to reflect long-term strategic interest, with security as most fundamental state responsibility	Revealed costs and preferences	Values
'Optimise'	Market rules	Market competition provides optimal allocation of resources *insofar as sufficient prices with credibility and foresight*	Acceptability
'Satisfice'	Education & options	Motivation	'Heuristic' behaviour in both individuals and organisations: opportunities for low-cost mitigation

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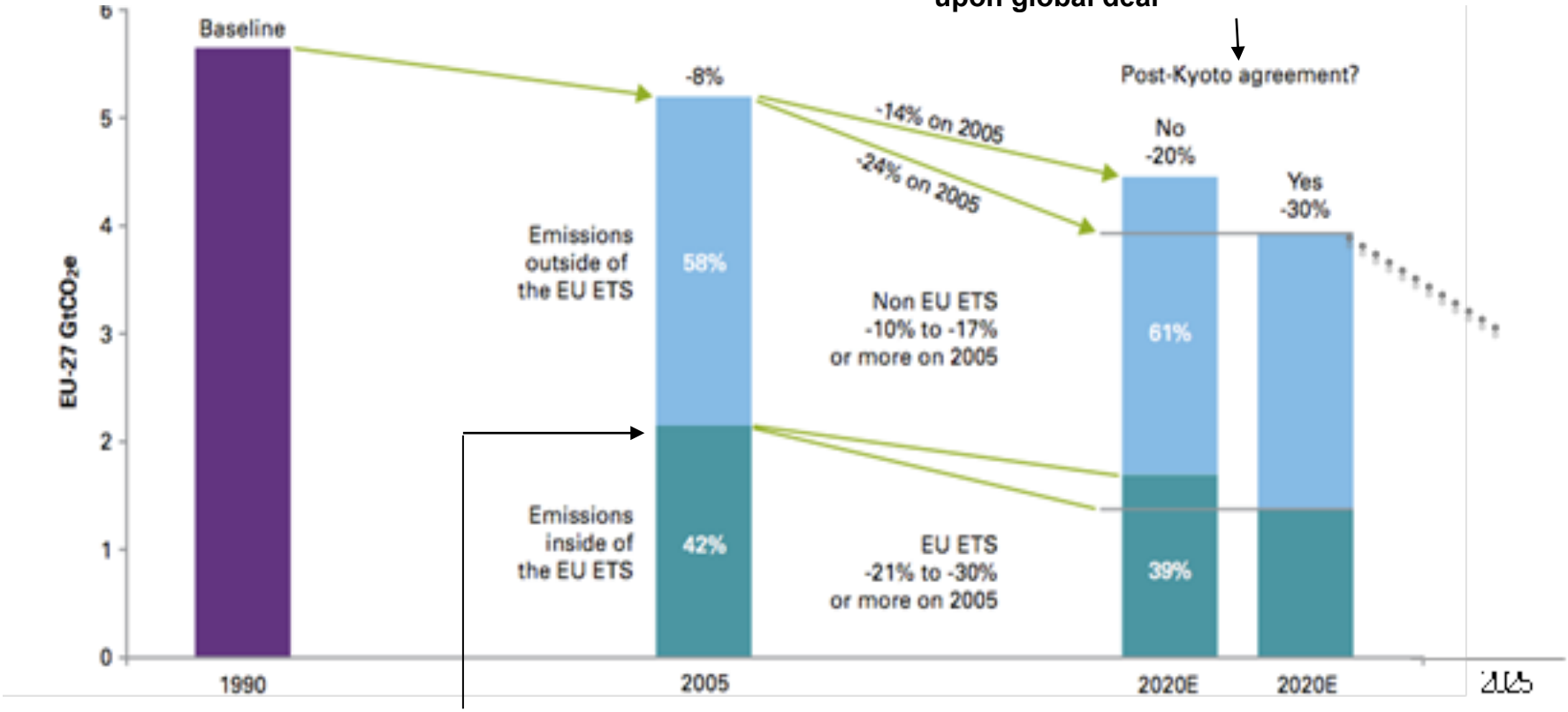
EU ETS Caps *direct* emissions from power and heavy industry in EU: started in 2005, in Phases:

Phase III extends 2013-2020 with continuing decline

Strength of cap by end of Phase III contingent upon global deal



MIT estimates EU ETS cut emissions by 50-100MTCO2 in first year, 2005

Review of cap

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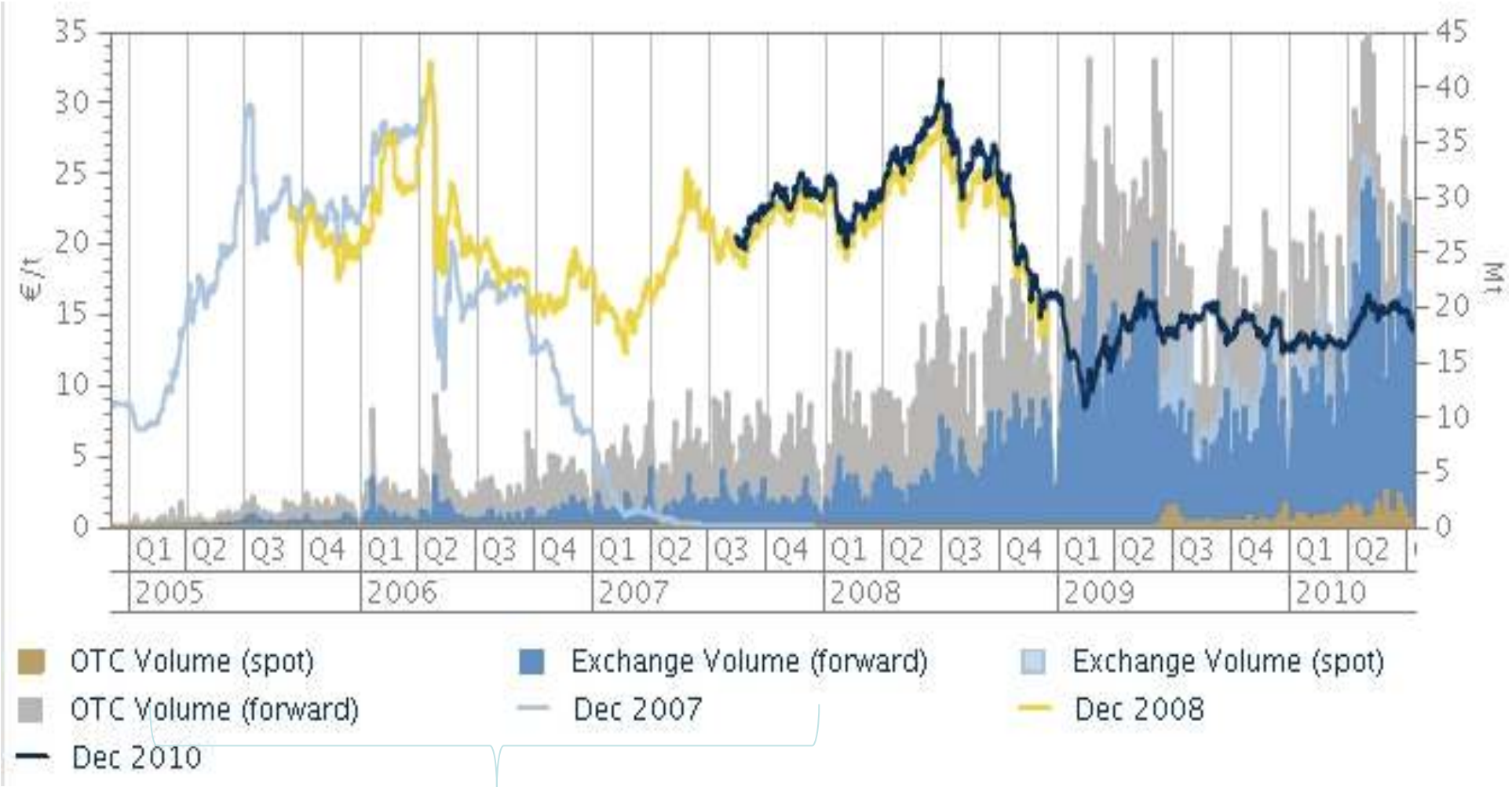
ETS quite volatile in Phase 1 and first year of Phase 2, more stable since



(MIT) Estimated emissions savings 120-300MtCO2

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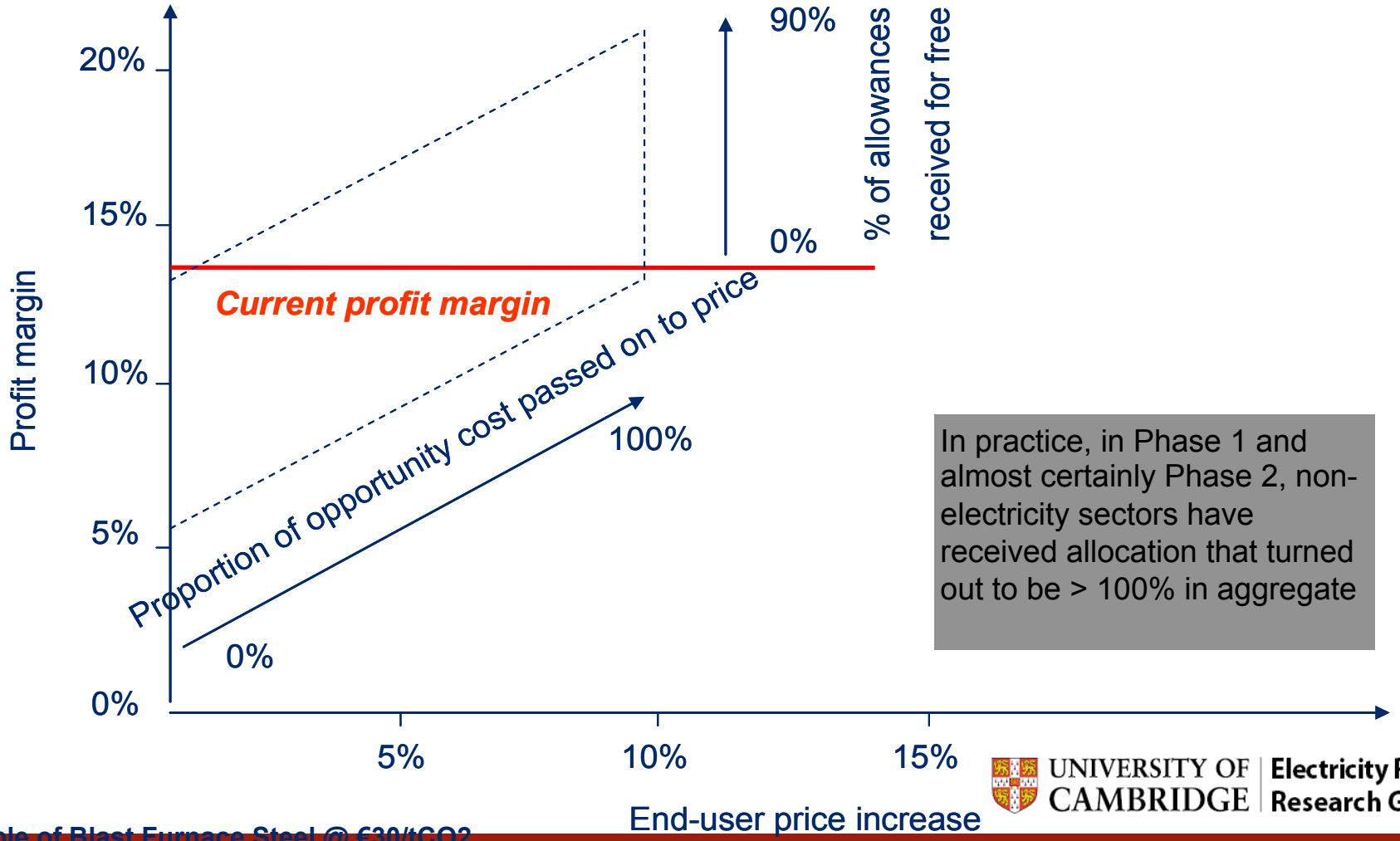
Industries have potential to profit and all participating sectors have profited to date

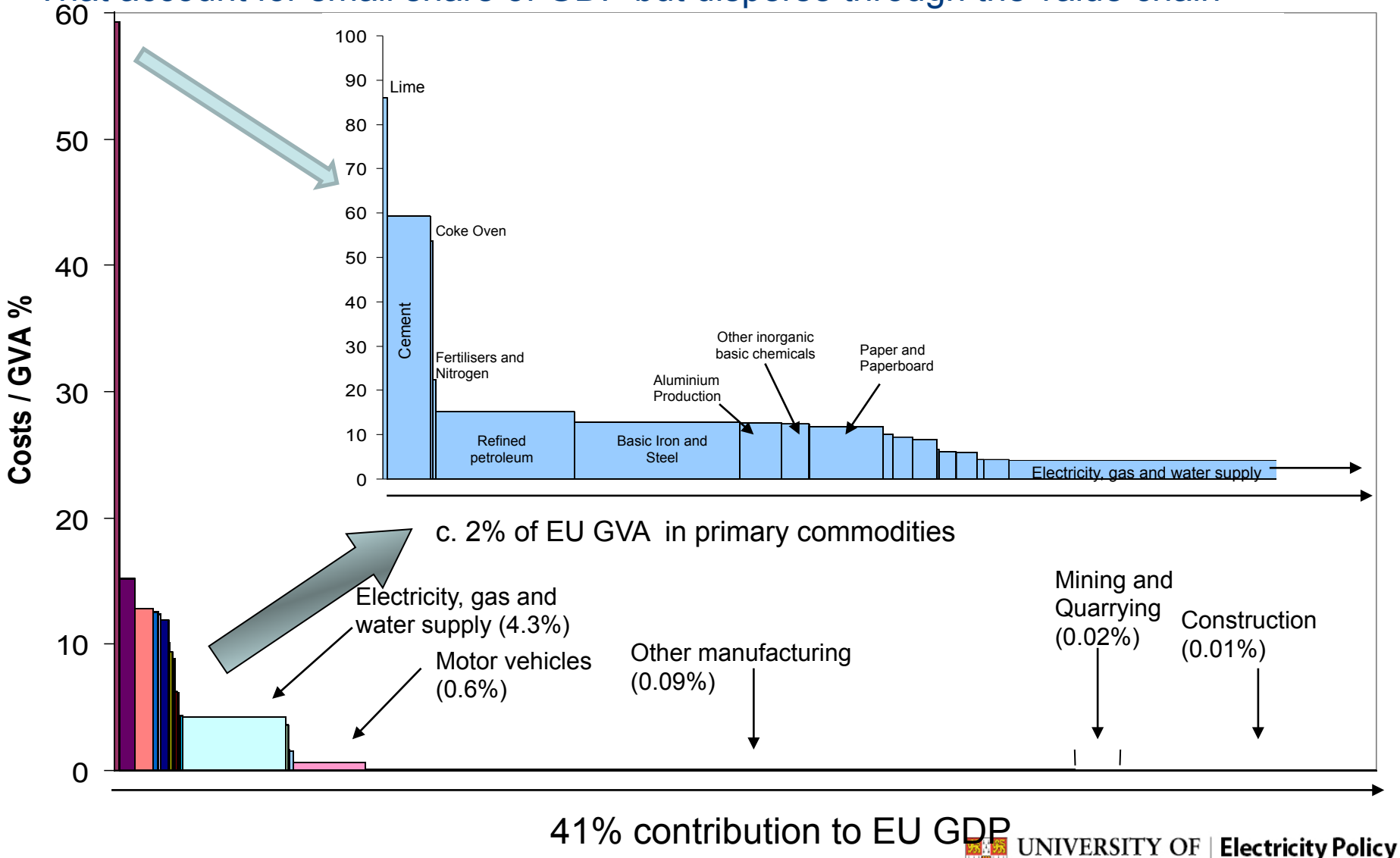


In practice, in Phase 1 and almost certainly Phase 2, non-electricity sectors have received allocation that turned out to be > 100% in aggregate

Example of Blast Furnace Steel @ €30/tCO2

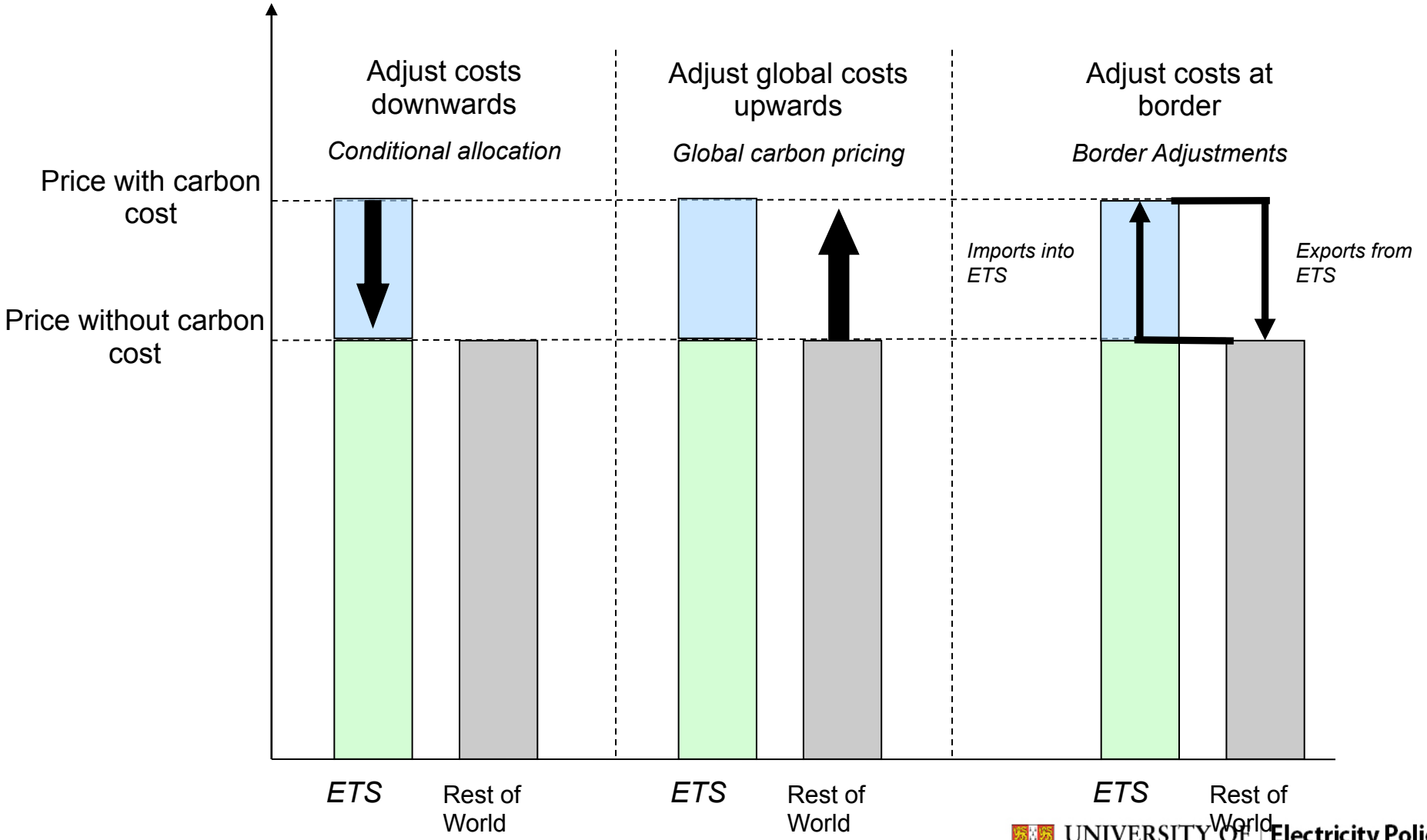
Fundamentals: Carbon *very concentrated* in basic commodities

- That account for small share of GDP but disperse through the value chain



Source: Grubb, Hourcade and Neuhoff, *The carbon connection (Earthscan, forthcomong 2011)*

Fundamental options for addressing carbon leakage
- Level down, adjust at border, or wait to level up everywhere?



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‘Leveling down the costs’ with free allocation

Myth 3. “Free allocation is an effective solution”

- To be effective in tackling carbon leakage, such ‘leveling down’ must be aligned with production and investment decisions
  - Fixed allocation under the EU ETS may not deter operational leakage
  - Effectiveness declines under declining caps or finite duration

Myth 4. “Free allocation is free”

- Protecting energy intensive sectors inevitably requires the rest of the economy to ‘work harder’ to reach a given emissions target
- Degrades the underlying incentives to decarbonise
  - The need to align may negate more of the incentives to decarbonise along supply chain – particularly with ‘output-based’ allocation (US and EC models greatly underestimate this potential impact)
  - *Also* can be seen as a trade distortion – eg. through over-allocation, output-based and (eg. agricultural) offsets
  - And yet, this is the solution dominant in EU, Australia (& former US proposals)

Source: Climate Strategies (2009): Droege S. et al., ***Tackling Carbon Leakage in a world of unequal carbon prices***, final report

We have two profoundly different Border Adjustment discussions

Trying to deter 'inadequate' action by other countries is very different from focused objective to tackle carbon leakage

- Threatening trade measures against countries not taking 'comparable' action
  - Extra-territorial judgement on 'adequate' action
  - Explicitly discriminatory

- Tackling carbon leakage through border levelling
  - In principle, cost-levelling between domestic and international where a specific problem can be demonstrated
  - Generally non-discriminatory

Myth 5. "The best *general* solution is to protect our economies and pressurise other countries using border adjustments"

The feasibility, effectiveness and economic and political consequences of border adjustments varies according to sector characteristics

- Diverse production processes and products increase potential for distortions and abuse
- May be more controversial for exports than (benchmarked) imports

Any border measures need justification on *sector-specifics* not *generalities*

Myth 6. "All Border adjustments are discriminatory, threaten trade & political relations"

We already do it … (eg. excise taxes on petroleum, and VAT)
Benchmarked 'Best Available Technology' border levelling is compliant with GATT Articles I and III - no need to negotiate exemptions

Border leveling is particularly relevant to sectors that are:

- Energy intensive and operate in international markets
- Relatively homogenous products - operates on price competition
- Relatively homogenous production processes – benchmarks are useful
- High operating carbon cost impacts (plants might otherwise part load)

Border levelling in the recent WEF paper

'From Collision to Vision: Climate change and World Trade'
World Economic Forum Ah-hoc group on Trade and Climate change, Nov 2010

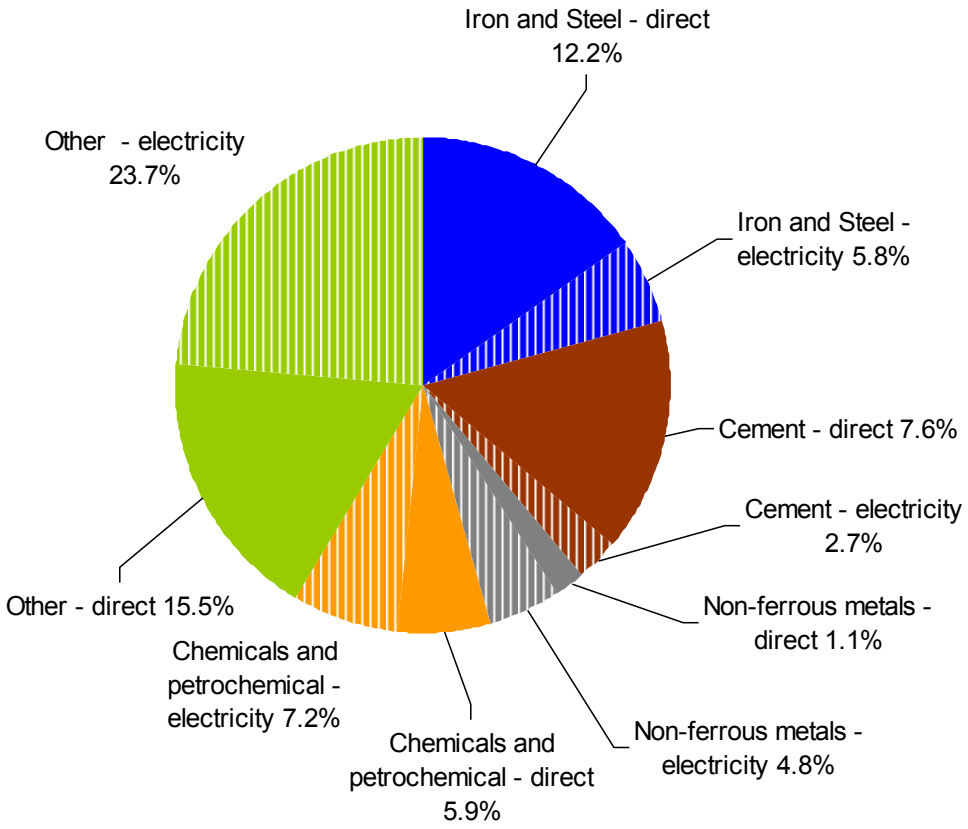
- A national measure could be enacted to address climate change that might assuage domestic concerns about carbon leakage in a manner consistent with existing WTO obligations. Depending on how it was framed and applied, this could, in concept, be true of a carbon tax on products if such a tax took the form of a permitted border tax adjustment under WTO rules … [which] permit a charge as a border tax adjustment on important products .. [or] .. A remission as a border tax adjustment on exported product..

- 'There is no WTO case law that clarifies …' (whether energy / carbon / fossil fuel tax .. Can be adjusted..)

Characteristics of border leveling

Charging embodied carbon on sector-by-sector basis as appropriate

Global emissions from different industrial processes



Key criteria

- Scale of emissions
- Scale of leakage concern:
  - Relative impact of carbon costs
  - Scale of existing trade barriers
- Availability of alternatives
  - Effectiveness and losses associated with free allocation
  - State of international sectoral agreement
- Feasibility of border leveling
  - Diversity of products
  - Diversity of production processes

- ***Cement is the most obvious sector initially***

Conclusions

- Economies diverging on the ridge of oil depletion
- Multiple policies needed, with carbon pricing at the core but not only pillar
- A key challenge is carbon leakage
  - current practice of free allocation is unsustainable for long term
  - likely to give way to border carbon charges on imports, probably by 2020
- The logical system would be for 'carbon added' regulation through treaty terms of a low carbon coalition
- Key question is whether low carbon coalition will be purely *importer-driven*, or whether any major producers will get on the low carbon road & be at the table
- .. topic of final talk 'Lessons from the EU ETS' (3.00pm Friday @ UNSW/Norton Rose)

INTERNATIONAL CLIMATE POLICY

And implications for Australia

Presentation to **CMI/Baker McKenzie/UNSW**
Sydney, 11 April 2011

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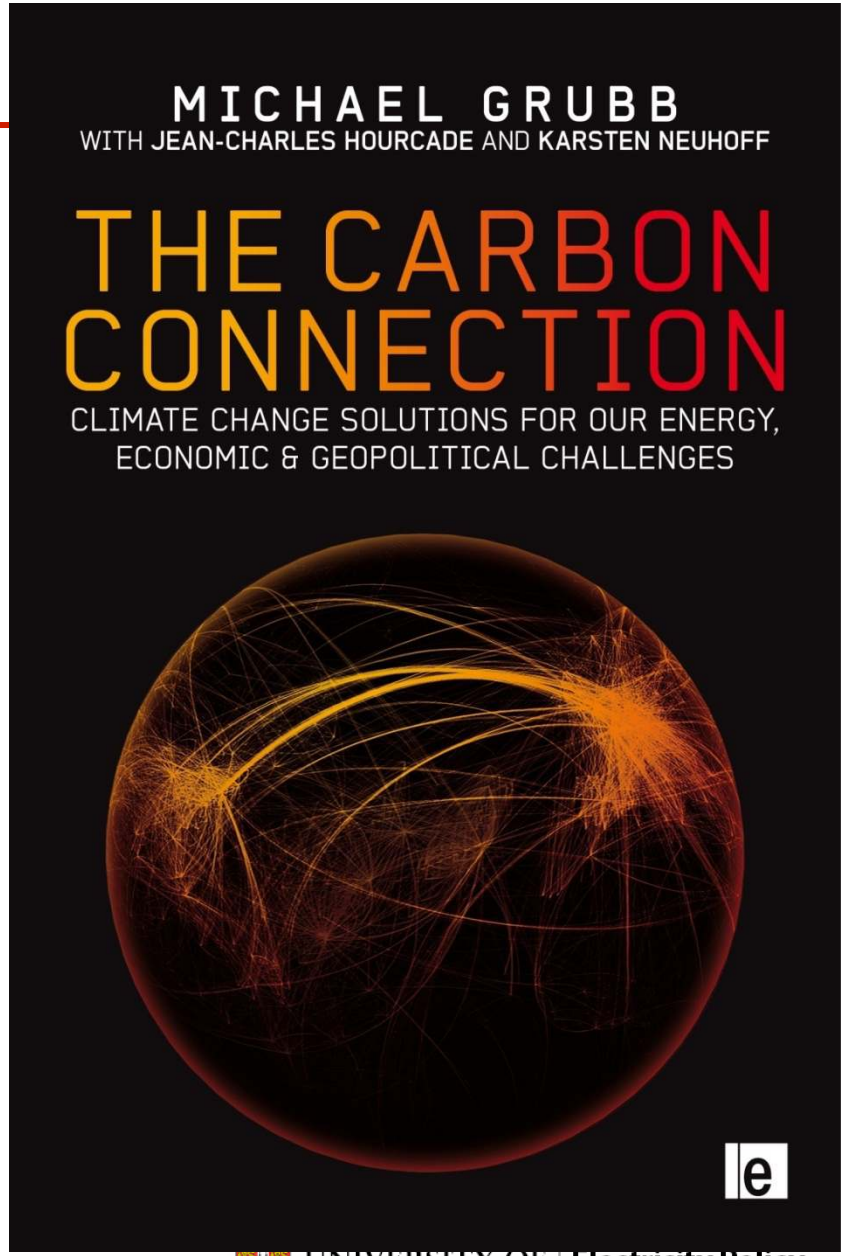

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