"Beyond 'Standard' policy"?

- Integrating carbon pricing, technology and behavioural dimensions

Michael Grubb

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Paris 2015 and Beyond: Cooling the Climate Debate

27 October 2015

- What is 'standard' policy?
- Key concepts: three domains, three pillars
- Third Pillar empirics: Innovation & the energy sector
- Innovation and carbon pricing
- Why a pricing+technology view for international cooperation?

What is 'standard' policy? If 'price carbon', then..

Two anniversaries

25 years ago (1990): Official European Commission proposal on harmonised carbon taxation, to be levied by EU Member States.

- Finally abandoned 1998

5 years ago (2010): With Democratic majority in both Houses, Waxman-Markey cap-and-trade proposal passes House of Representatives but fails to gain 60 votes in US Senate

Two quotes

"There appears to be a nearly inverse relationship between those policies that policy analysts tend to endorse as holding the greatest promise .. and political feasibility .."

- Rabe 2008, 106, As cited in Grubb et al., Planetary Economics, Chapter 6: 'Pricing pollution: of Truth and Taxes'

'Carbon pricing is political suicide'

- Stephan Dion,

former Canadian Environment Minister and (briefly) leader of the Liberal Party
Comment after losing the General Election to Stephen Harper

On carbon pricing, price vs quantity: the central challenge is the divergence between represent economic agent(s) and democracy

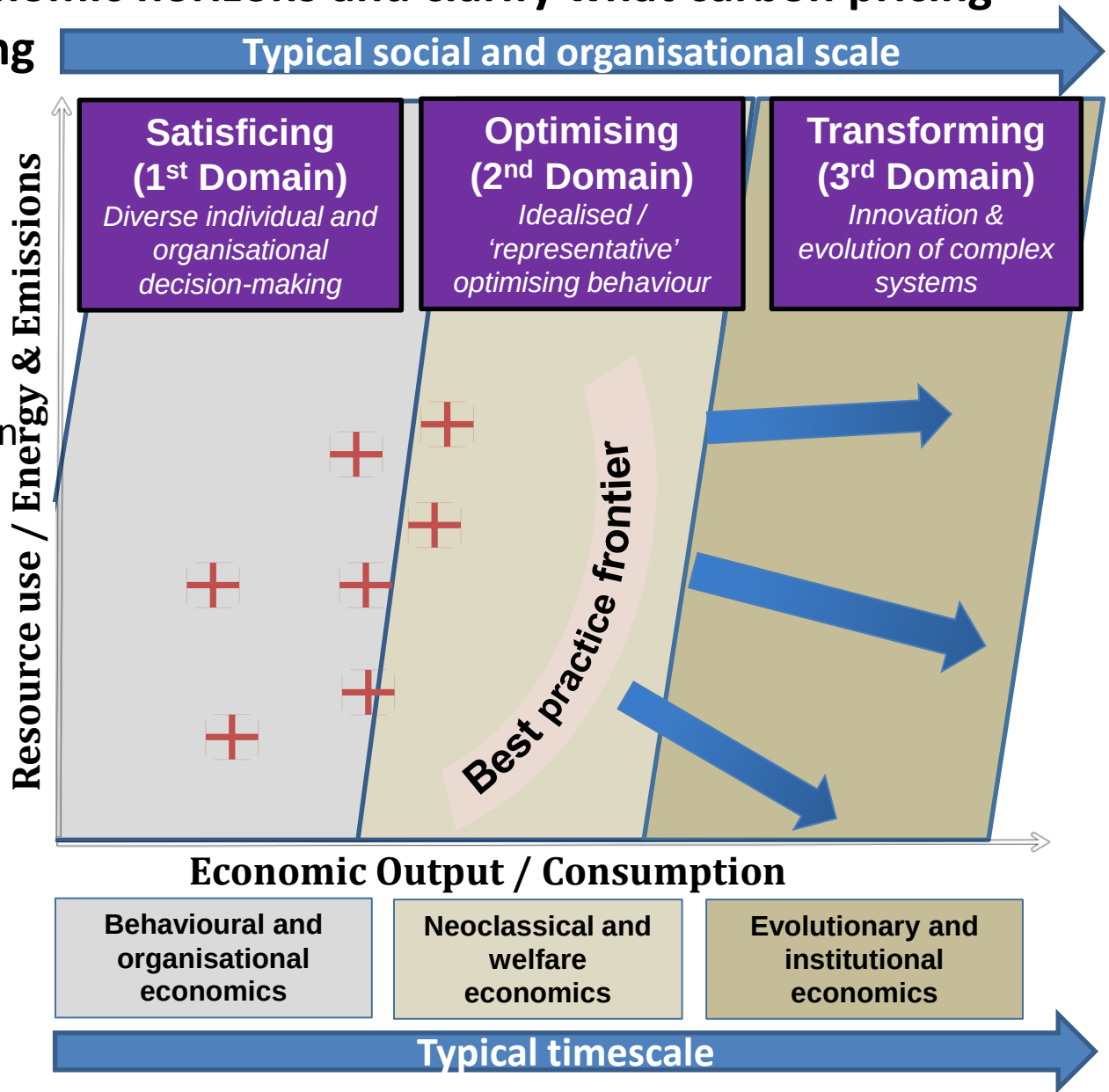
- Well informed rational economic agent in a well functioning market trusting government
  - Price is the most efficient instrument
  - Revenues / double dividend helps offset costs
  - 'Vikings and virtues'
- For most voters
  - Emission reduction is a recognisable public good
  - Taxation is a much more pressing private bad
- Not at all clear that the trust etc issue improved by internationalisation
- The smart approach likely to
  - start with quantity cap-and-trade
  - increase the degree of auctions over time
  - and then, once established and the economy doesn't fall over
    - introduce a price floor / corridor through reserve price auctions, along with
    - a coherent account of ***tangible*** benefits including how the money will be used

First need to broaden economic horizons and clarify what carbon pricing can deliver for those paying

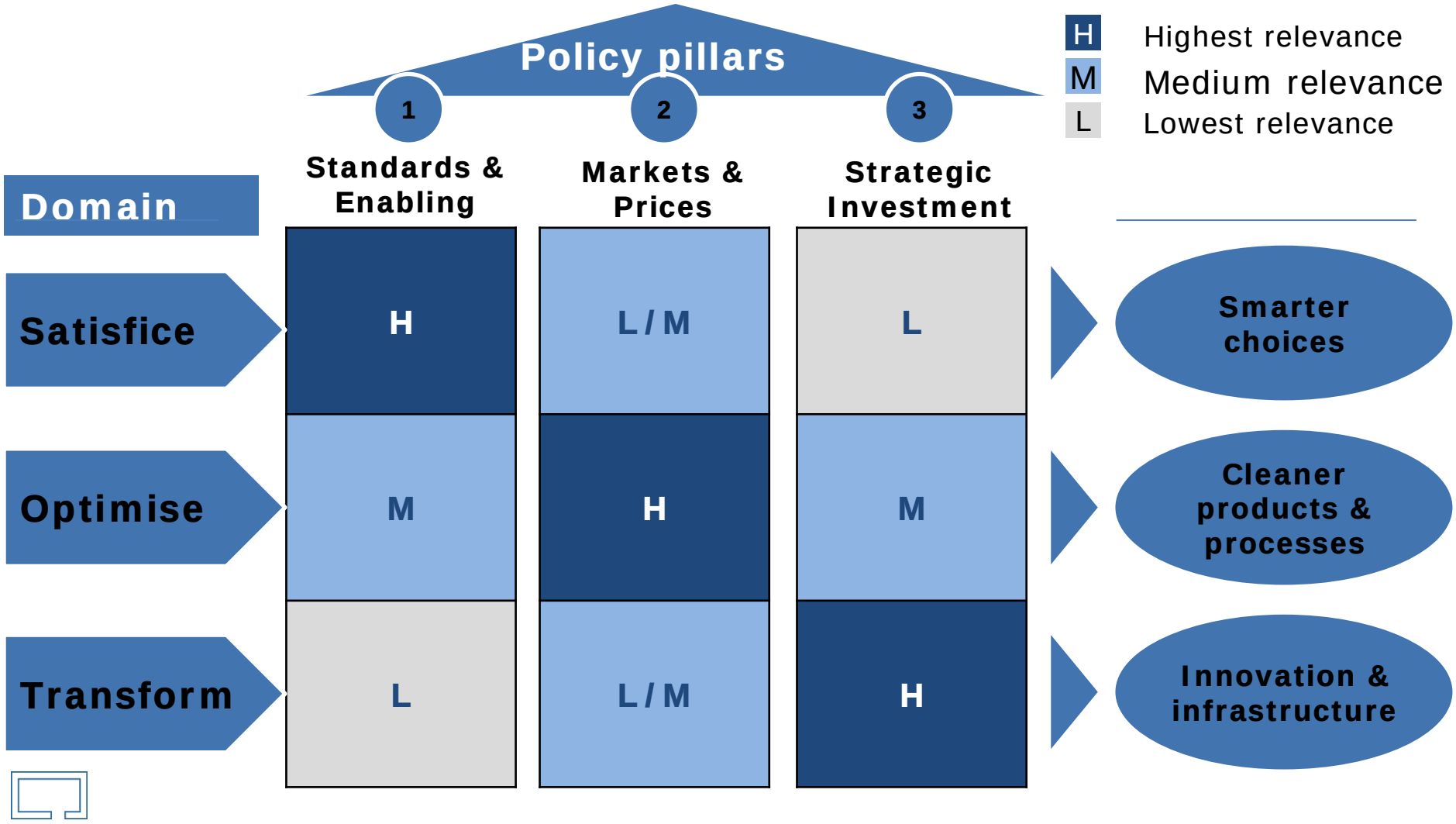
For a problem which spans from

- the inattentive decision-making of seven billion energy consumers
- to long-term transformation of vast and complex infrastructure-based techno-economic systems

And in which empirically 'standard policy' has been far more on energy efficiency and technology / renewables etc policy than carbon pricing



Ideal policy needs to match the best instrument to the respective domain of decision-making processes



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Innovation: ‘For every complex problem there is an answer that is simple, plausible – and wrong’ (in this case, two)

“Technology is the answer” - but technology development is a very complex process and the policy solutions are not simple:

- *Public R&D investment by governments* to develop technologies has mixed history and faces serious institutional dilemmas
  - ‘picking winners’ – or not
  - mutual programme dependencies (the ‘exit’ problem)
  - cooperation vs competition
  - policy displacement
- *Even where market pull forces are important*, it is a long way to actual large-scale industrial innovative risk-taking, which ideally would need
  - perfect R&D markets
  - long term certainty and policy stability on environmental pricing
  - Good communication between government, research, and industry
- ‘Market-led’ innovation particularly difficult in context of ‘public goods’, the undifferentiated nature of product and the networked complexities of energy

.. And we are seeking radical innovation in some of the least innovative sectors of our economies

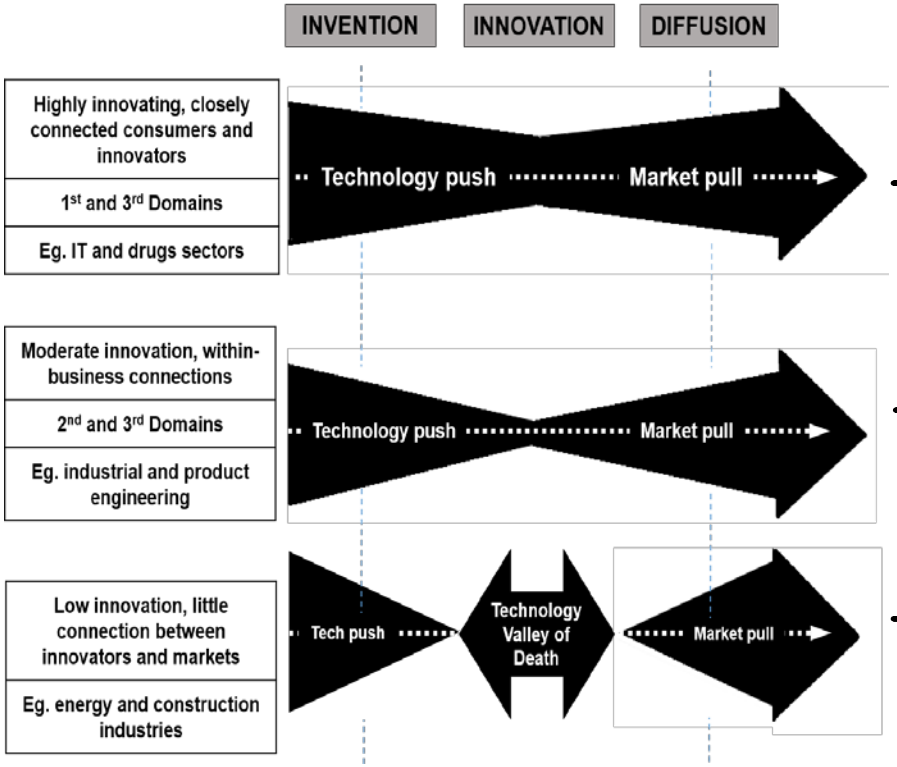

Fig.9.7

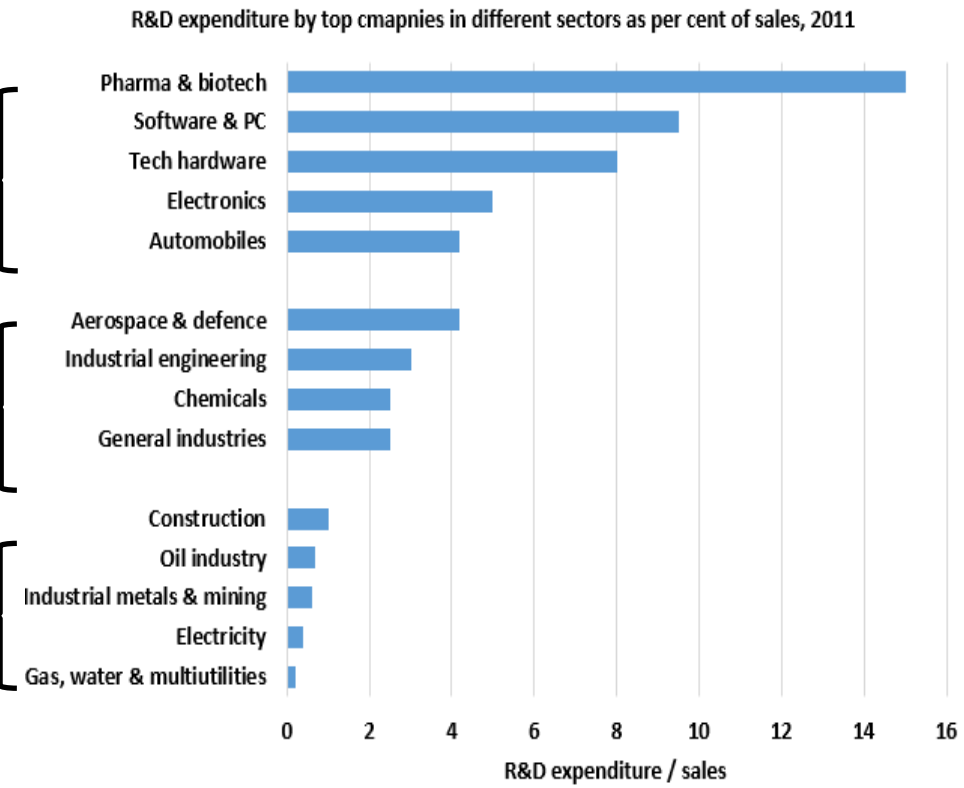

Fig.9.3 R&D expenditure by top companies in different sectors as % of sales, 2011

The 'technology valley of death' caused by

high up-front innovation costs & long lead times => large risks

weak demand-pull and large market risks in innovating for policy-dependent value

Mix of strategic investments in both technology push and demand pull needed to overcome numerous obstacles

Some core points about Third Domain economics

- Neither pace nor direction of energy innovation is optimal
  - (least of all in presence of a public bad – see Acemoglu, Aghion et al 2012 & 2013)
- Accelerating innovation in such sectors can generate an economic surplus
  - which can be shared between private and public / cooperative
- Innovation is not synonymous with R&D but must span the full innovation chain
  - the economic gains emerge as industry gets closer to market and supply chains mature
  - The deployment phase also starts to forestall fossil lock-in costs – the challenge is systemically to generate positive not negative lock-in
- 'Carbon leakage' (-ve) is increasingly offset by 'clean technology diffusion' (+ve)
  - The latter grows over time
- …which also amplifies the economic gains to the earlier emergent industrial supply chains

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What is missing?

Money ==========➔
(at rising scale)

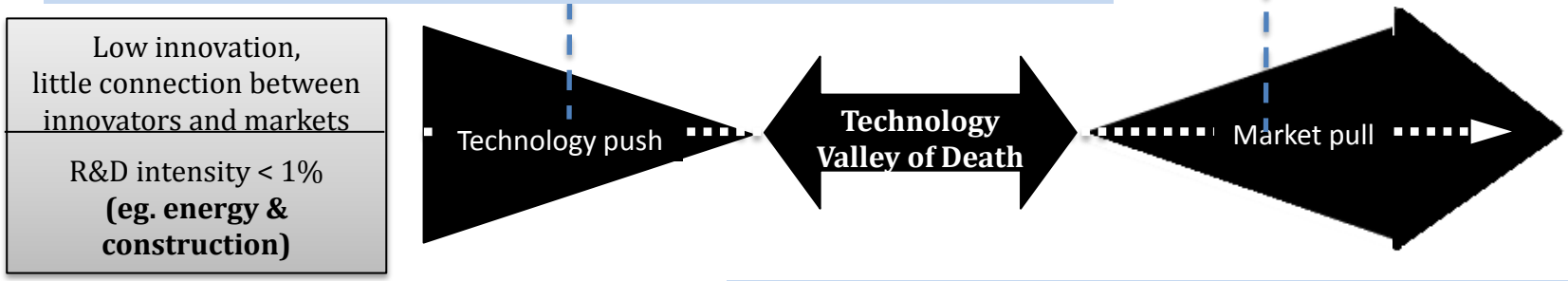


Figure 9.7. Innovation intensity and the broken chain

➔ ======= Markets
(credible and strategically growing)

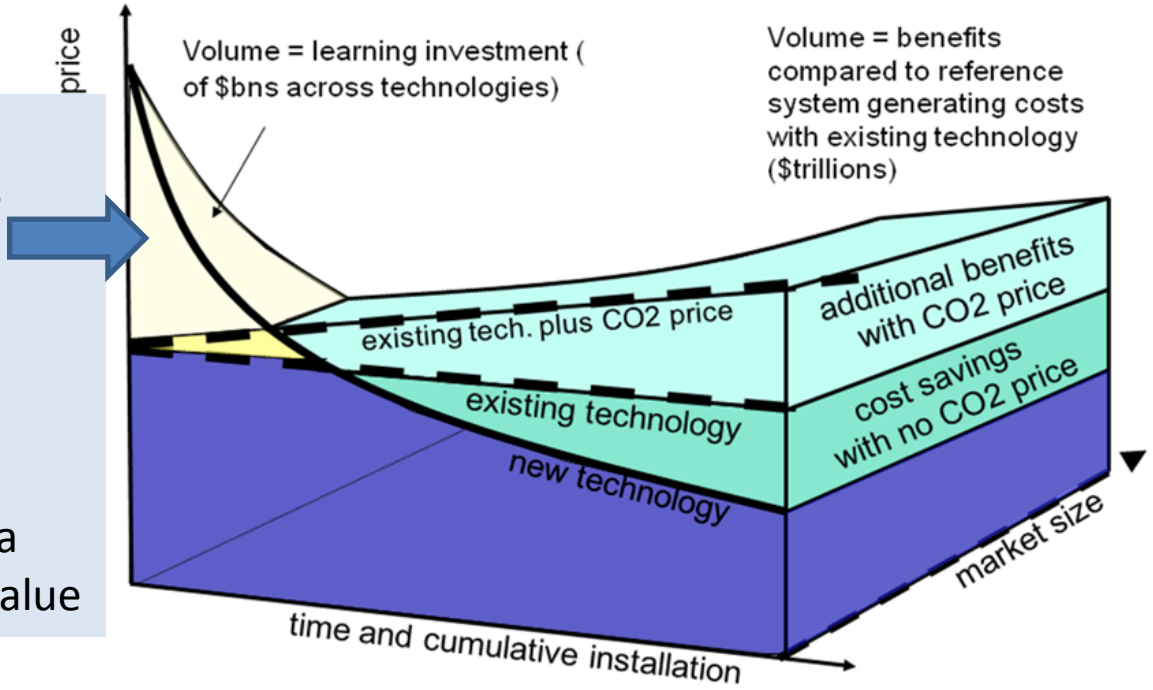
- We have gained extensive experience of policies to span innovation chain
- Need integration between public and private, & strategic investment and markets
- Infrastructure important as the technologies expand – need to overcome lock-in
- International technology cooperation can enlarge the market and amplify the benefits
- Regulatory structures and institutions must evolve along with technologies & systems

Pillar III Conclusions

Strategic investment can be costly but the returns can be huge …

Eg. North-Sea oil investments in the 1970s cost UK c.£10bn/yr; full *direct* costs >> $100/bbl
But benefits enormous

Value of low carbon innovation enhanced by a rising carbon reduction value



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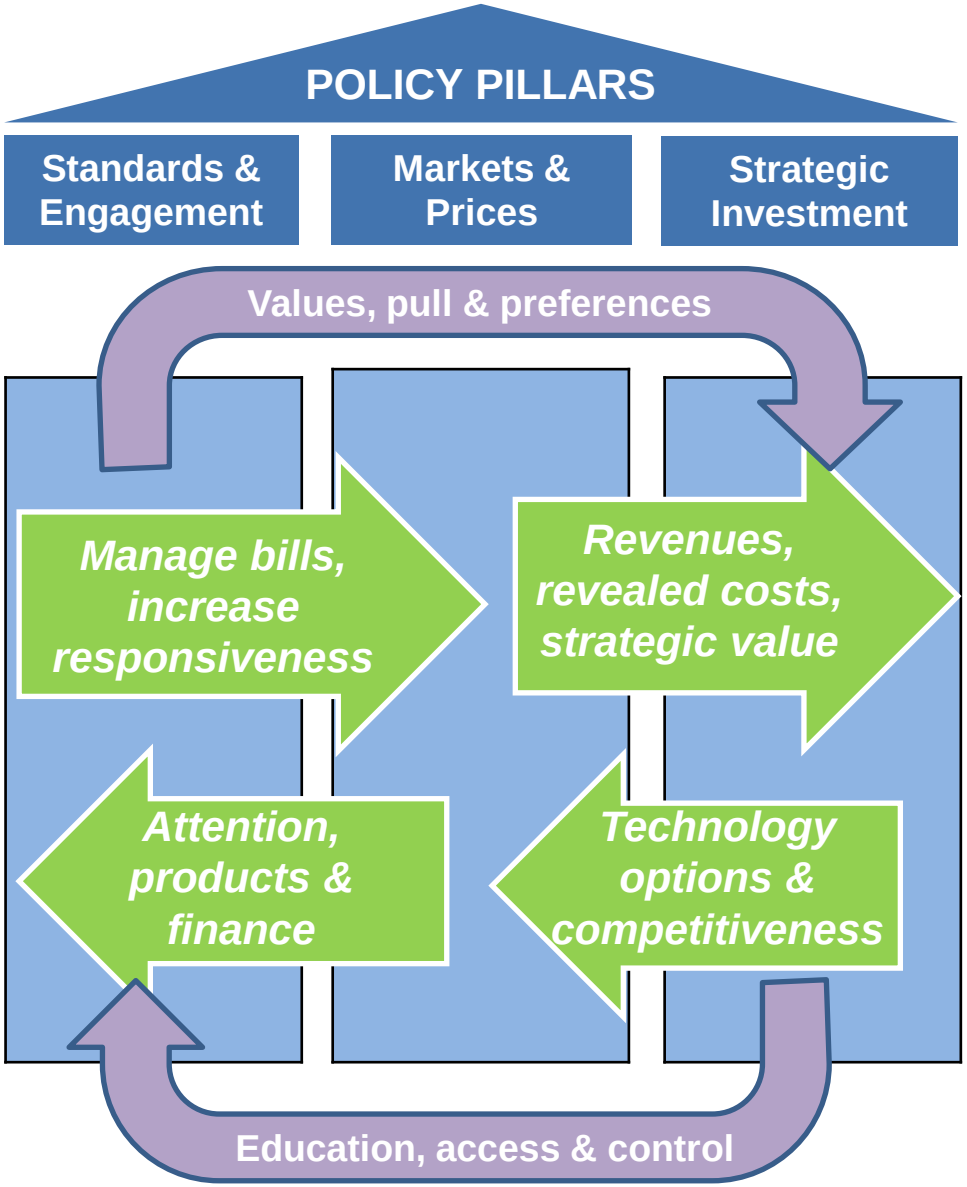
International – why combine pricing & technology?

- Many international efforts focus on targets or pricing
- Innovation has an essential theoretical appeal in a global context – accelerated innovation can generate a surplus
- …. And a very practical one
- But has a mixed record and a surprising low profile in the international negotiations
  - Major focus has been push by developing countries on technology transfer / cooperation
  - Which makes industrialised countries nervous both about Intellectual property and costs

Key is to integrate and synergise across all three pillars



Carbon pricing is not '**the** Standard tool'

- but properly designed it could maybe become a 'First among Equals?'

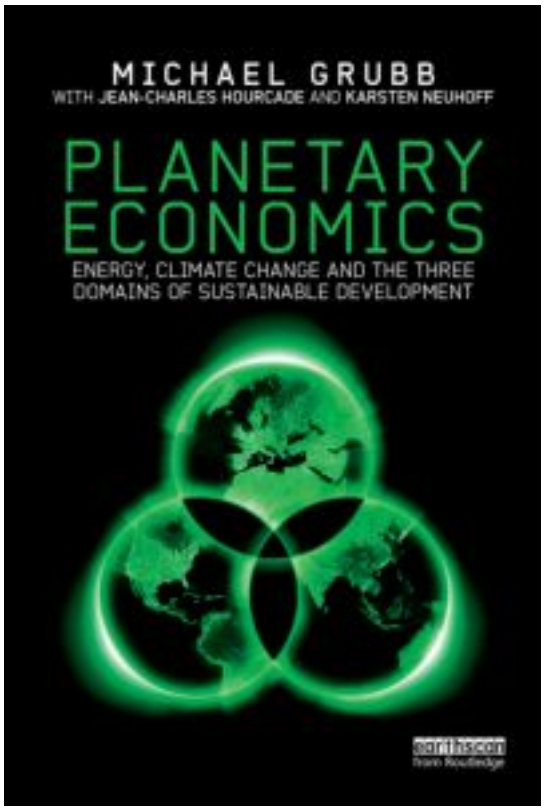
A **rising base** carbon reduction value *could* contribute *across* domains:

1. Attention effects and funding	• rising steadily enables efficiency to keep pace and stop much rise in total bills • efficiency programmes may counter regressive concerns, domestically and internationally
2. Rising price differential	• steadily reduce use of coal in power generation without huge asset stranding • help to move renewables over time from transitional subsidies into mainstream market
3. Long term visibility and leverage	• increased investment stability • earmarked funding for innovation & infrastructure • Technology cooperation and tariff reduction agreements enlarge club and amplify benefits

Embedding in international agreement and linking with technology could create a 'club good' and enhance stability and credibility

Planetary Economics:

Energy, Climate Change and the Three Domains of Sustainable Development



1. **Introduction: Trapped?**
2. **The Three Domains**

Pillar 1

- **Standards and engagement *for* smarter choice**
- 3: Energy and Emissions – Technologies and Systems
- 4: Why so wasteful?
- 5: Tried and Tested – Four Decades of Energy Efficiency Policy

Pillar II

- **Markets and pricing *for* cleaner products and processes**
- 6: Pricing Pollution – of Truth and Taxes
- 7: Cap-and-trade & offsets: from idea to practice
- 8: Who's hit? Handling the distributional impacts of carbon pricing

Pillar III

- **Investment and incentives for innovation and infrastructure**
- 9: Pushing further, pulling deeper
- 10: Transforming systems
- 11: The dark matter of economic growth

12. **Conclusions: Changing Course**

Published Routledge 2014: 6-page 'Highlights' paper available

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for further information #planetaryeconomics