

## Michael Grubb

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Remarks to

CEEPR-EPRG-EDF European Energy Policy Conference

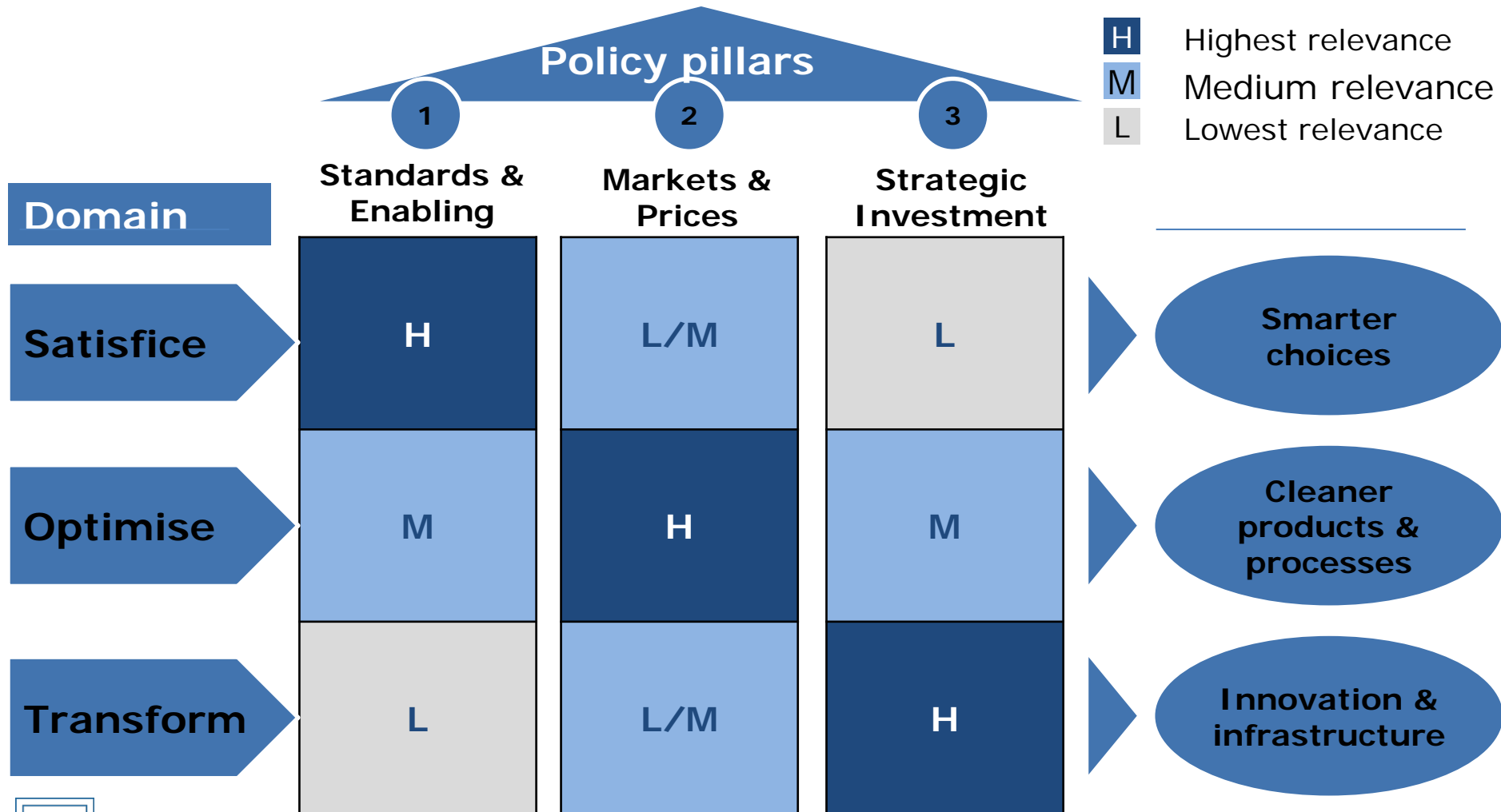
Paris, 7-8 July 2016

Session: “*Now Comes the Hard Part*”: Climate Policy After COP21

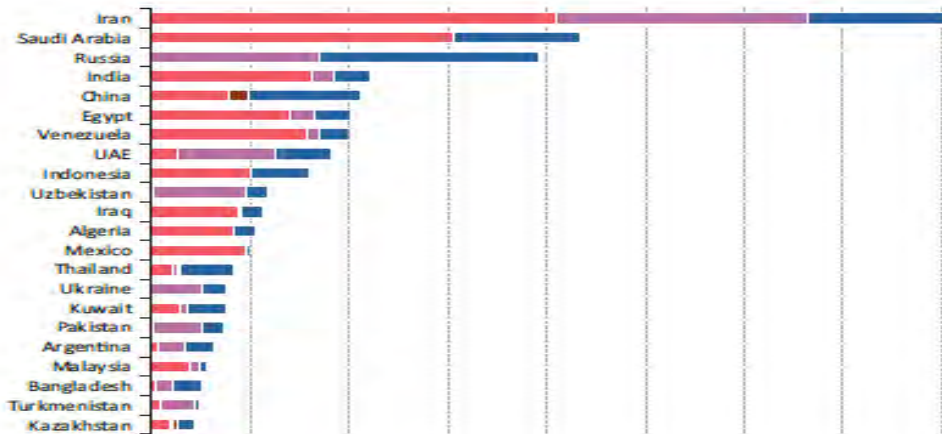
- Some real-world complexities
- On pricing and innovation
- Constructing a ‘club good’?



Ideal policy comprises a package which matches the best instrument to the respective domain of decision-making



# Carbon pricing will overlay complex structure of ...

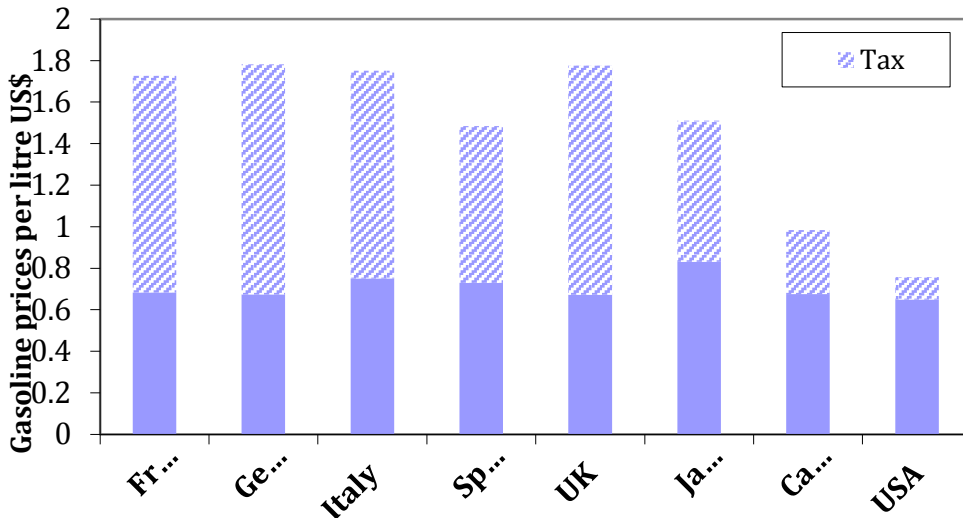


## Existing Energy Subsidies ..

- Large developing country consumer subsidies
- Sizeable developed country producer subsidies
- Highly fluid with national reforms and fluctuating international prices

## And taxes ..

- diverse consumer taxes across industrialised countries
- gasoline taxes in EU & Japan equate to *several hundred \$/tCO2*



Could do 'gross' carbon price in defined instruments; still problematic to draw line between 'good' and 'bad' guys for definition of generic eg. border adjustments ?

## Carbon prices will necessarily differ between countries

- Under classical utility assumptions, the *welfare cost* of a given carbon price inverse to GDP
  - Unless perfectly compensating international transfers
- ‘All politics is local’
  - Any coalition or club will need to allow for prices differentiating at least within a range, maybe even if linked (implying exchange rates)
- Implies pricing ‘club’ *on its own* will not solve carbon leakage for energy-intensive production
  - Though it might provide a framework for doing so



## Another way to generate a ‘club good’?

Remarks to

Program on Science, Technology and Society at the Harvard Kennedy School  
lecture series on Science and Democracy

Cambridge MA, 4 November 2015

- Some contextual remarks
- A Gedanken experiment
- On energy sector innovation + carbon pricing clubs



# Switch tack: we are seeking radical innovation in some of the least innovative sectors of our economies

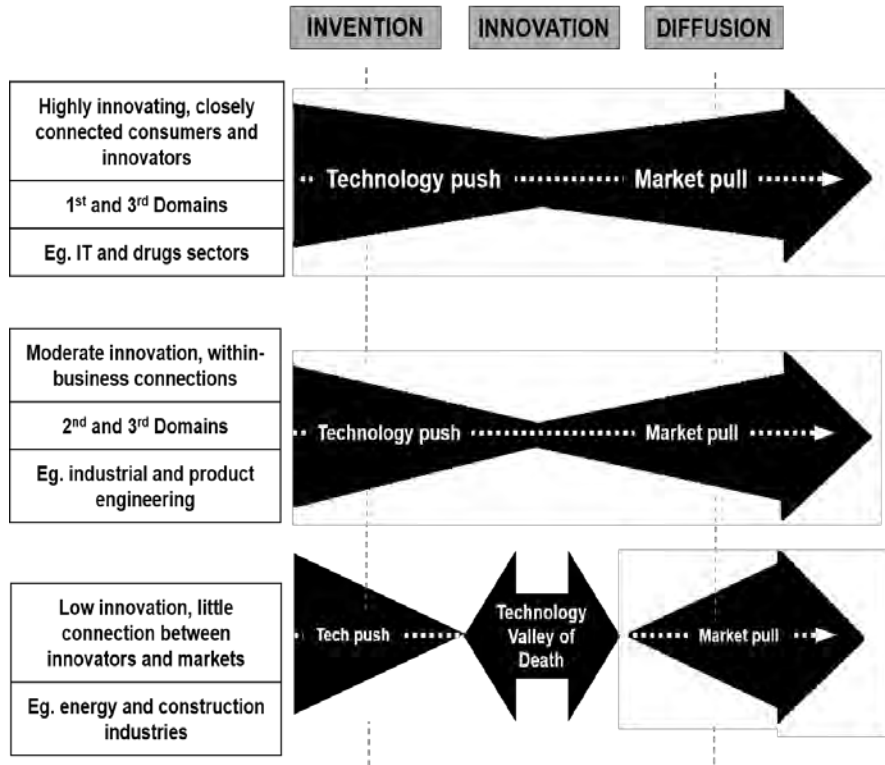


Fig.9.7

R&D expenditure by top companies in different sectors as per cent of sales, 2011

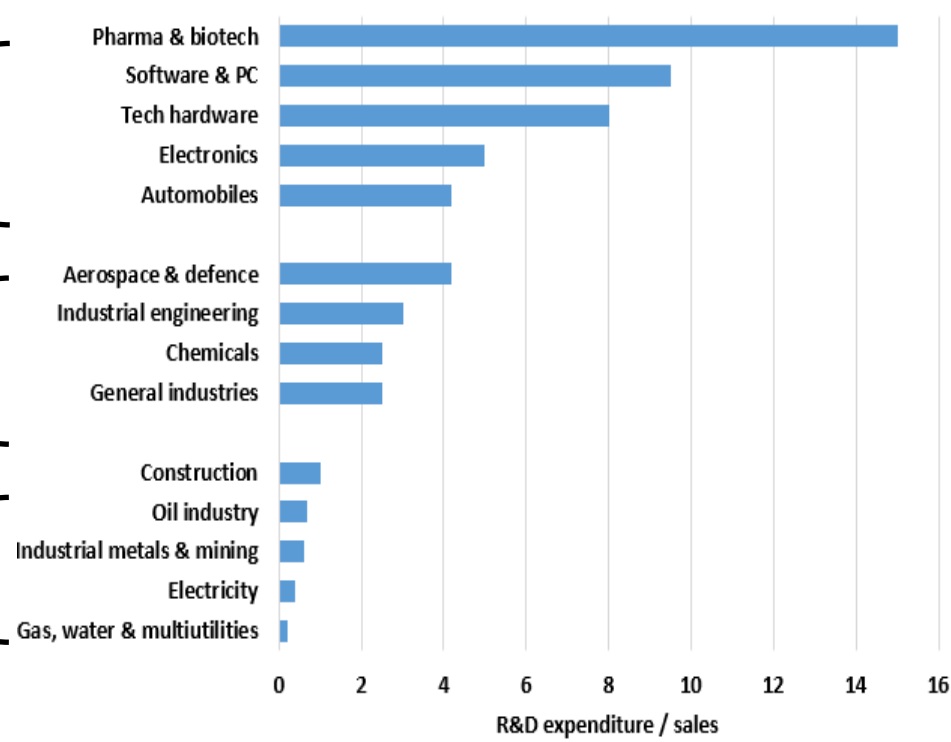


Fig.9.3 R&D expenditure by top companies in different sectors as % of sales, 2011

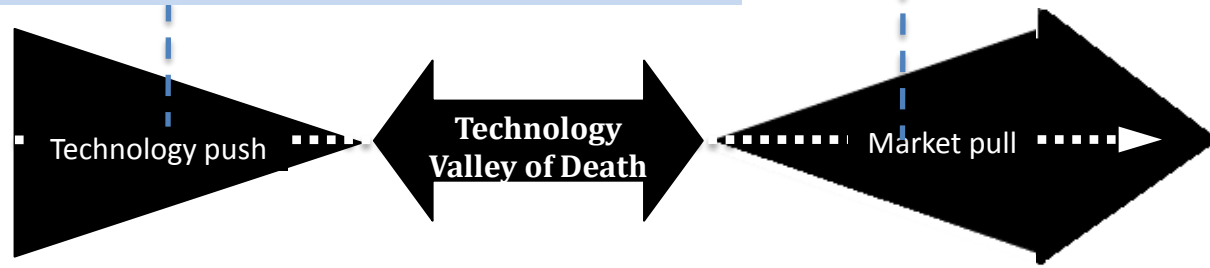
The 'technology valley of death' caused by  
 high up-front innovation costs & long lead times => large risks  
 weak demand-pull and large market risks in innovating for policy-dependent value

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

# What is missing?

Money =====>  
(at rising scale)

Low innovation,  
little connection between  
innovators and markets  
-----  
R&D intensity < 1%  
(eg. energy &  
construction)



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

PE Figure 9.7. Innovation intensity & the broken chain

- 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

## Renewed carbon pricing narrative:

- Not an abstract (externality pricing) but an *instrumental* rationale
  - Investment as well as operational incentive (credibility central)
  - A source of funding for energy efficiency and innovation programmes
  - A political narrative based around the Bashmakov-Newbery constant of energy expenditure
- Carbon leakage
  - A sector-specific problem potentially addressed through carbon pricing on material consumption
  - increasingly offset by ‘clean technology diffusion’ as part of Third Pillar

## Innovation / evolutionary (“Third Domain”) economics:

- Accelerating innovation in such sectors can generate an economic surplus
  - which can be shared between private and public / cooperative
- Innovation not synonymous with R&D, must span the full innovation chain
  - the economic gains emerge as industry gets closer to market and supply chains mature
  - systemically generate positive not negative lock-in
- Carbon pricing a crucial part of the incentives and returns





# 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

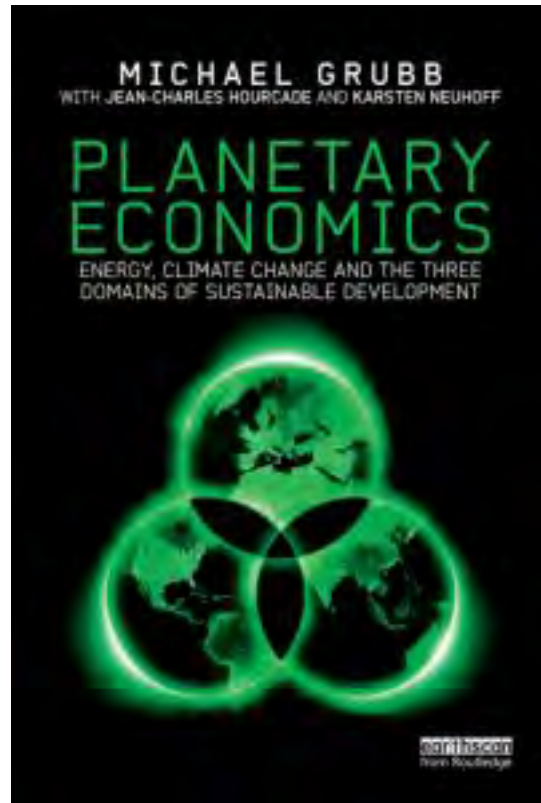
### Pillar II

- **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

<http://climatestrategies.org/projects/planetary-economics/>

for further information #planetaryeconomics