Tyndall Centre for Climate Change Research

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Adaptation and Mitigation Strategies:
Supporting European Climate Policy

Reforming the Global Financial System to Support Decarbonisation

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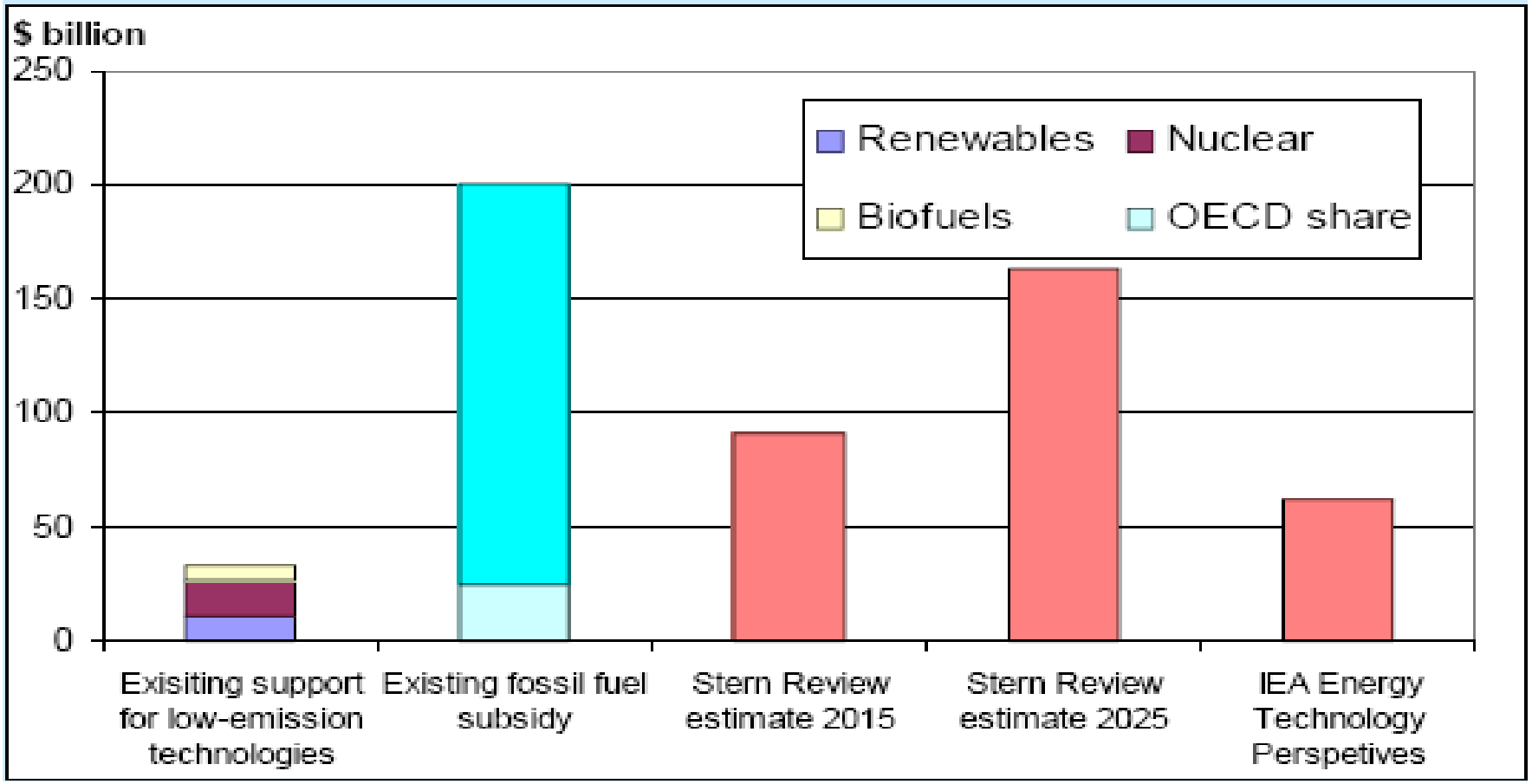
The scale & mix of the implied investment

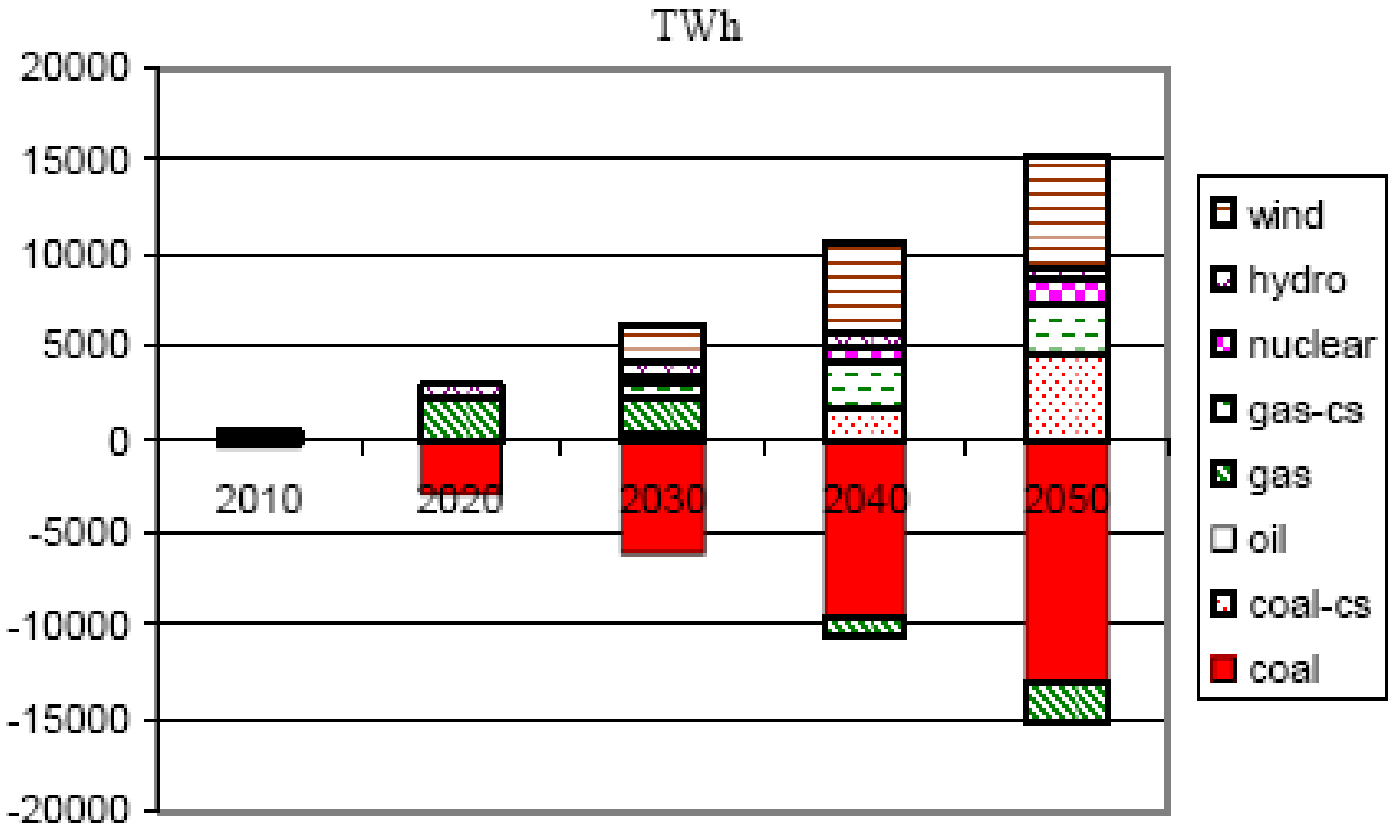
- A high and reliable carbon price is needed to make low-GHG investments profitable
- Further R&D and deployment of low-GHG technologies is required to for accelerated decarbonisation (GHGs down 30-40% by 2020)
- The IPCC literature largely assumes a global ETS with perfect foresight, but actual behaviour and policies are much more varied
- Many demand- and supply-side policies are likely to be cost-effective inducing investment in all sectors
  - no regrets options in buildings and industry
  - early opportunities decarbonizing electricity generation
  - and hybrid/electric vehicles

Stern Review: estimated scale of current and necessary global deployment support



HMT Stern Review (2006), p. 371

World Bank estimate of change of technology mix, EPRI de-carbonized case: Non-OECD Countries



Source: World Bank and IMF 2006: An investment framework for clean energy and development: a progress report. DC2006-0012. September 1, p. 22.

World Bank, IEA WEO ‘Alternative policy scenario' and IEA ‘Map' scenario

- World Bank (2006 for G8):
  - to 'significantly de-carbonize power production' requires incremental investments of 'up to' US $40bn/yr globally, of which about US$30bn/yr in non-OECD countries
  - offset by the reduced investment requirements arising through the systems from improved end-use efficiency
- IEA WEO 2006 'Alternative policy scenario‘:
  - extra total investment of $2.4tr to 2050 (about $50bn a year) in improved efficiency offset by $3tr savings in supply investments
- IEA 'Map' scenario (IEA, 2006a) (GHG emissions to 2005 levels by 2050):
  - extra renewables, nuclear and CCS Investment of $7.9tr
  - $4.5tr is offset by fewer fossil-fuel power plants
  - also less infrastructure needed
  - net additional cost $100bn or 0.5% gross investment

Comments on the estimates

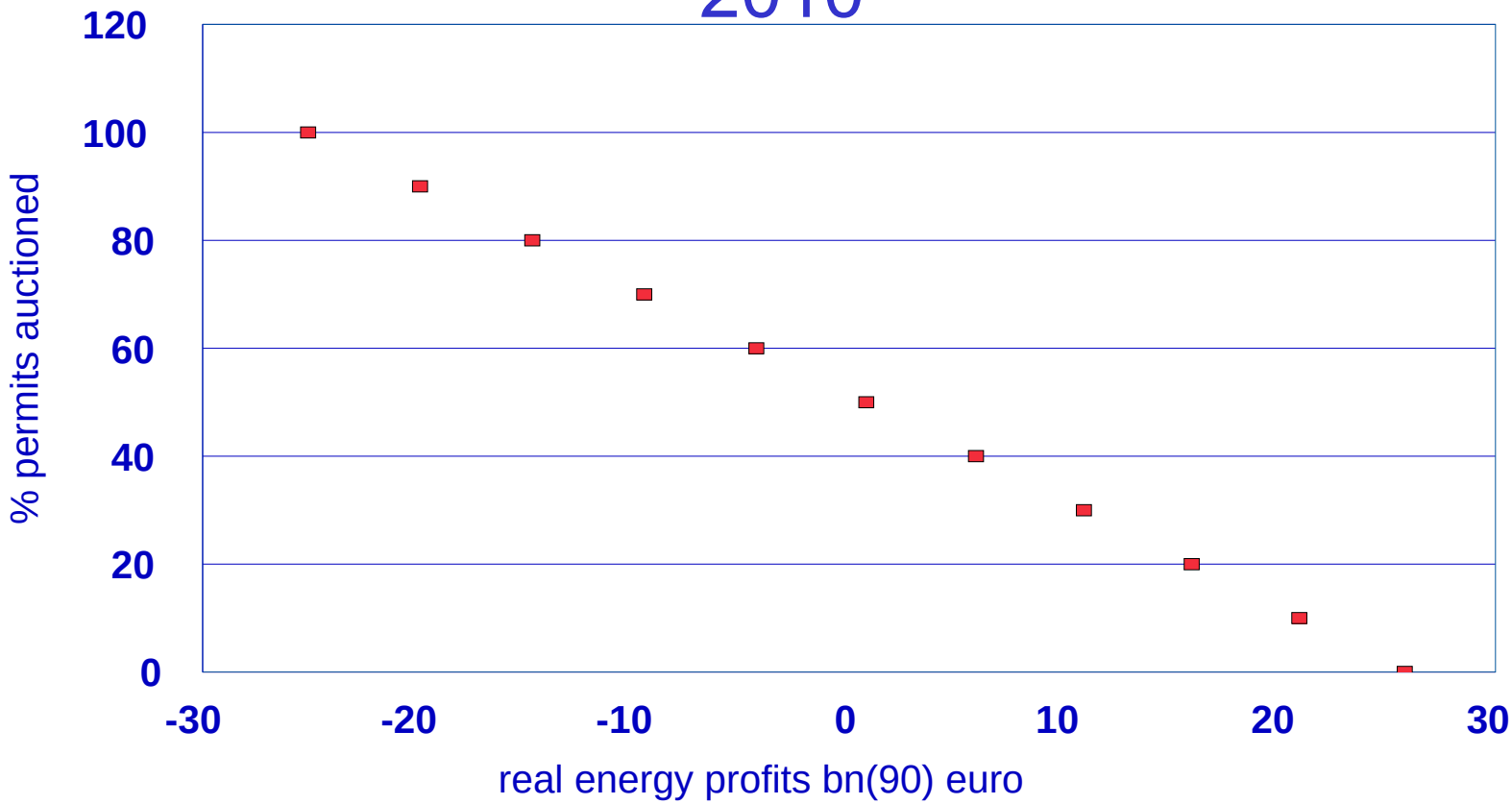
- Very uncertain (difference between two offsetting numbers: more low-carbon, less fossil equipment)
- Low-GHG investments are likely to be more front-loaded (learning-by-doing, as a focus of support)
- World Bank and IEA investments may not be sufficient to avoid dangerous climate change
  - E.g. IEA-ETP assumes carbon prices rising to c$25/tCO2 by 2030 then holding constant in real terms to 2050
- Substantial literature suggests that carbon prices of 20-50$(2000)/t$CO_2$ will make CCS profitable for many regions

Sources of funds

- Investment is often constrained by lack of funds
  - especially for decentralised renewables
- Most finance is internal (in energy sector, by state and multi-national corporations)
  - ETS with bench-marking yields substantial extra profits, but also an incentive to invest (see Barker and Rosendahl, 2000)
  - Global ETS implies cross-border flows (developing countries have more low-cost options)
  - Globalizing MNCs (e.g. Arcelor Mittal) will force technology transfer
- CDM and other new mechanisms for funding
- World Bank: revised rules for energy funding

Memo from 1999 study:

Permit auctions and energy-sector profits: mixed policies for 8% target Europe-19 in 2010



Source: E3ME project January 2000

Note: Energy sector includes all energy industries plus energy-intensive industries. Allowance prices about $(2000)35/tCO2, no auctioning.

Features of policies for successful GHG mitigation

- A global carbon price (long, loud and legal)
  - a post-2012 policy agreement involving USA
  - rising to about $100/tonne CO_2 by 2020 (for deep mitigation)
  - wide coverage (energy, transportation)
  - flexible and efficient – linked regional permit trading schemes, multi-GHG, facilities to bank and borrow
  - substantial auctioning of permits (new entrants, revenues to support R&D and innovation)
  - supporting non-Annex 1 development through expanded CDM
- Technological agreements and R&D support
  - setting standards in global niche markets for low-carbon products and technologies (CCS, renewables)
- Reform and expansion of low-GHG finance
  - low-carbon funding through World Bank and IMF
  - new financial vehicles to reduce risks for low-carbon projects

Conclusion: towards a post-2012 regime

- EU ETS phase III as basis for a global ETS:
  - 10 year period, including aviation, other GHGs, and CDM
  - 40% auctioning, 50% free with benchmarking, 10% for market management; frequent auctions
  - auction revenues partly used to promote low-carbon technologies
- Global standard-setting to develop low-carbon niche technologies
  - E.g. Californian air quality regulations
  - Regions specialising in most suitable options
- International guarantee of DC growth
  - Substantial further increases in low-carbon technology incentives (directed R&D & tax rules)
- Focus on energy investment
  - fossil-fuel subsidies by World Bank to switch to