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ETS Allocation challenges – support for technology and innovation

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*Emissions Trading in Australia:
allocation challenges*
CEEM/EERH Public Forum
Sydney, September 2008

www.ceem.unsw.edu.au



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Technology – the “art of knowing and doing”

- ‘Orgware’ has most vital role
 - The framework in which key markets (energy + ETS) operate
 - Appropriate frameworks require high levels of coordination
 - Markets will often fail to create appropriate framework themselves
 - often actively work against such frameworks as a (temporary) source of competitive advantage – eg. Credit Crisis

Technology = Hardware + Software + "Orgware"

(taken from www.iiasa.net)



Hardware: Manufactured objects (artifacts)

Software: Knowledge required to design, manufacture, and use technology hardware

"Orgware": Institutional settings and rules for the generation of technological knowledge and for the use of technologies



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Innovation

“the path of conceiving, developing & implementing ideas through to generation of products, process & services”
(Australian Parliament, Inquiry into pathways to technological innovation, 2006)

- Very high levels of complexity and uncertainty
- “...uptake & deployment of existing sustainable technologies required given urgency of addressing climate change challenge
- Government roles at every phase of innovation cycle
 - frameworks and funding
- Appropriate industry response critically dependent on frameworks
 - *Public \$ alone unlikely to drive appropriate actions*

Figure 4.1 ▶ Schematic working of the innovation system

Sources: Adopted and modified from Grubb, 2004 and Foxon, 2003.

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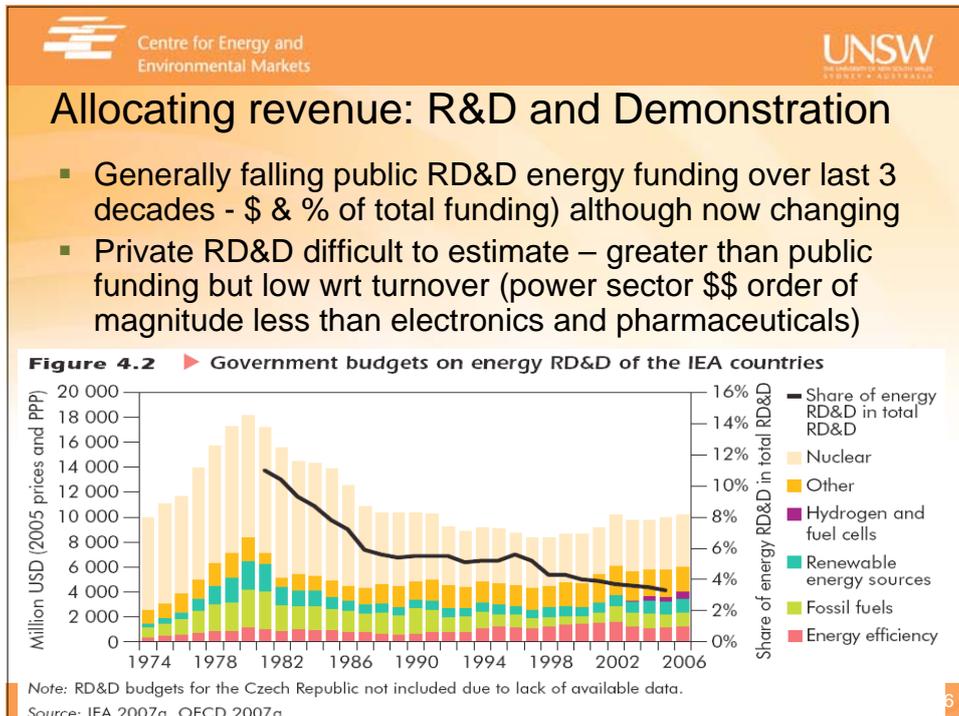
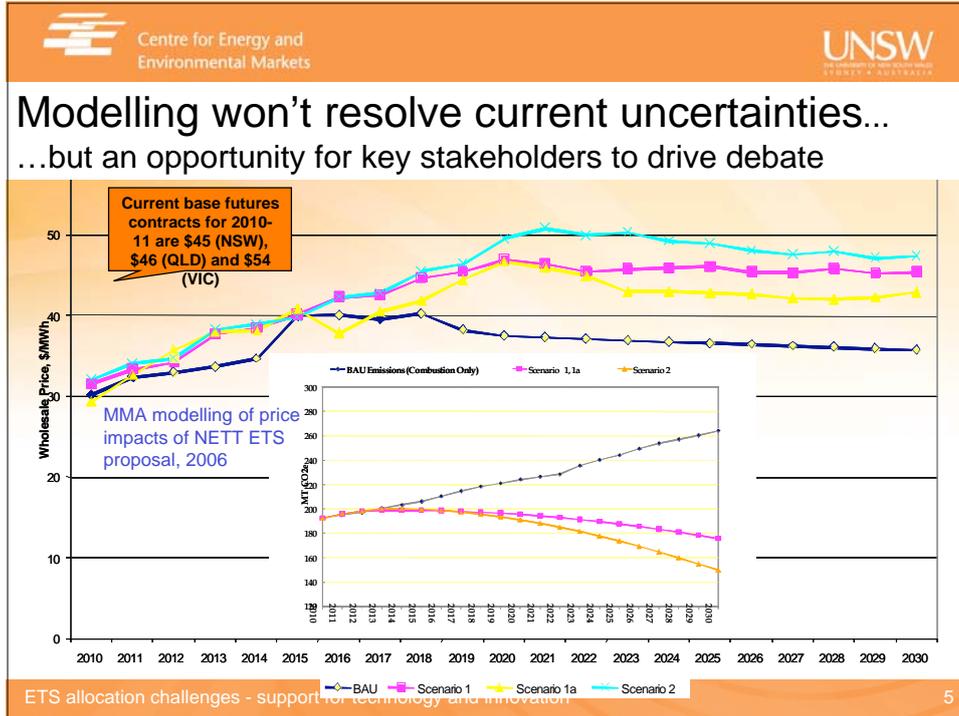
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Allocation – impacts on EI technical innovation

- Main innovation opportunities through investment
- Characteristics of investment in energy supply sector
 - generally lumpy, specific, irreversible, indivisible investments with long time horizon, high fixed / variable costs ...
 - Undertaken in context of shared infrastructure & high political interest
 - Significant advantages to incumbents
 - A wide range of risks; only some can be formally managed...
- Key question for incumbents & potential new entrants is governance risk
 - “Process whereby societies or organizations make important decisions, determine whom they involve and how they render account”
 - Free allocation, ‘compensation’ arrangements, promised ‘soft starts’, ‘invitations to Canberra’ may suggest lack of government resolve to deliver an effective scheme that rewards low emission innovation more than ‘corporate victim’ lobbying efforts & pressures for BAU
 - *One key to competition is potential for new entry – compensation cashes up high emission incumbents for whom “delay is victory”*

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- Impacts of RD&D uncertain & surprising
 - Fusion research yet to deliver, nuclear stalled in most of OECD
 - Emergence of GT techs driven by military RD&D in aerospace

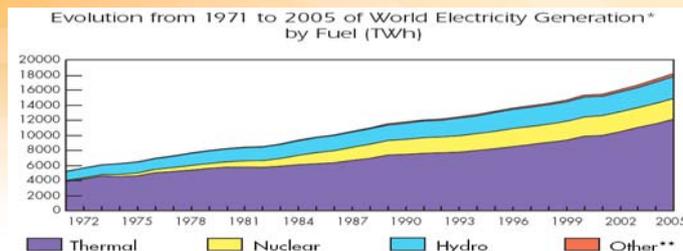
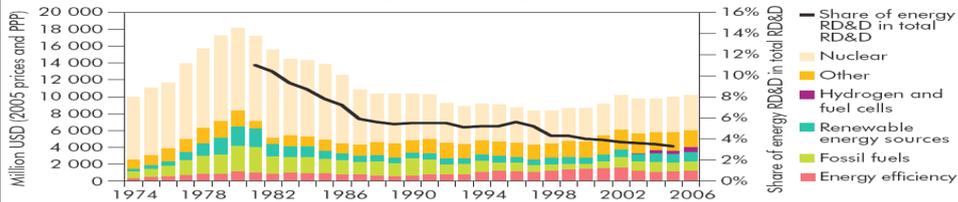


Figure 4.2 Government budgets on energy RD&D of the IEA countries



Note: RD&D budgets for the Czech Republic not included due to lack of available data.
Source: IEA 2007a, OECD 2007a.



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RD&D only a small part of innovation cycle..
ETS largely irrelevant at present
Deployment policies key to major investment (asset finance)

Figure 4. Global new investment by technology, 2007

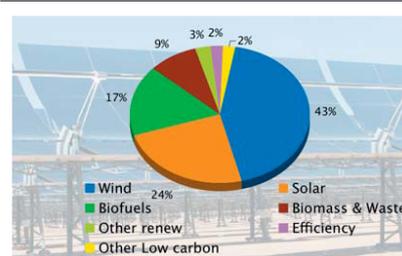
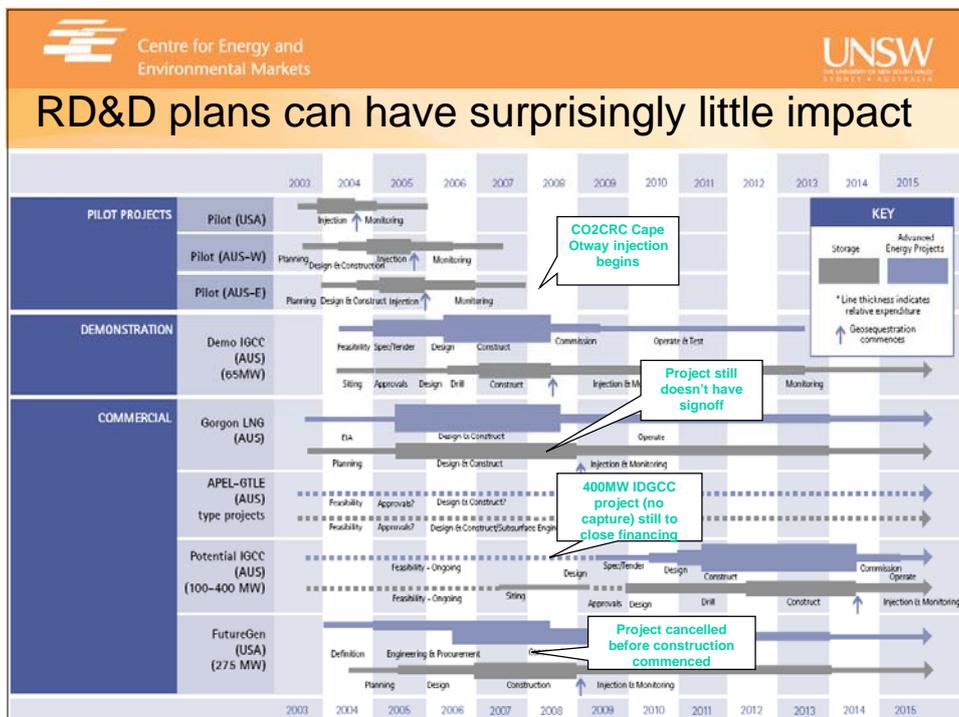
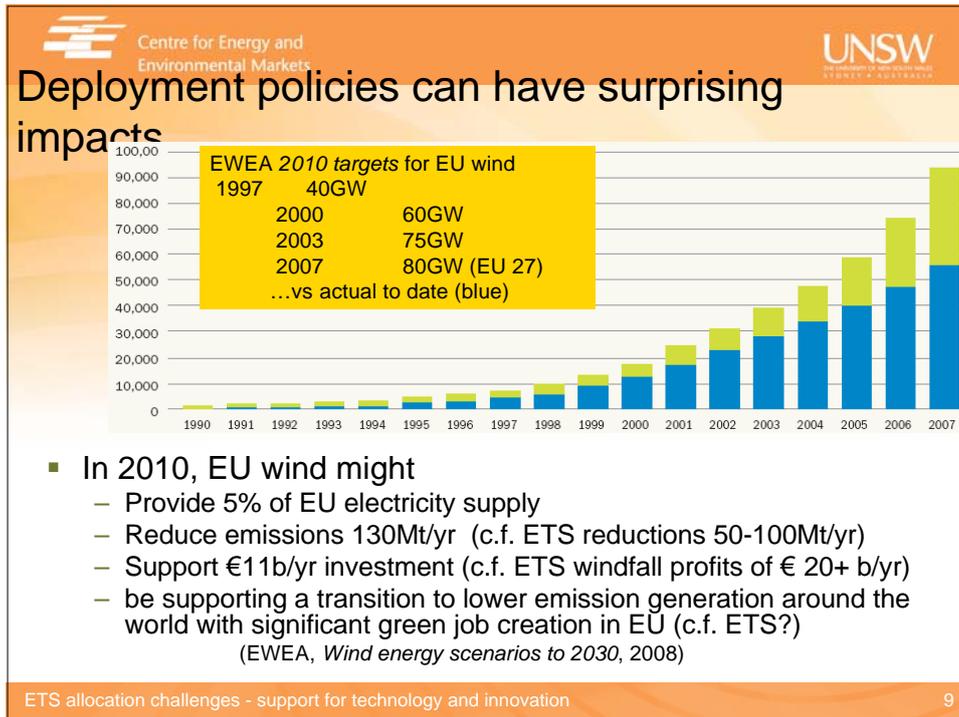


Figure 1. Global new investment in clean energy by asset class, 2004–2007



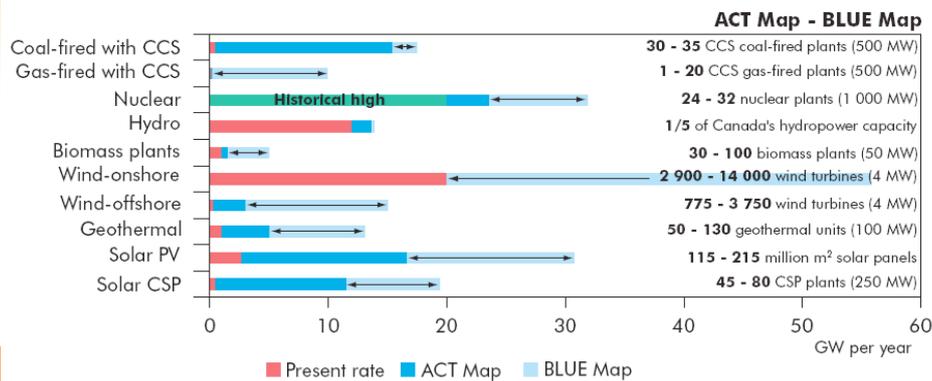




Considering proven + emerging options

- Likely CCS can play only modest role in climate protection in short-med term
 - Eg. IEA *Energy Perspectives Scenarios* (BLUE = 450ppm) see Coal CCS GW/year to 2050 similar to current wind and hydro rates, future off-shore wind, geothermal, similar to current hydro, future off-shore wind, geothermal, PV

Figure ES.3 ▶ Additional investment in the electricity sector in the ACT Map and BLUE Map scenarios (compared to the Baseline, 2005-2050)



Possible policy conclusions

- ETS schemes performance to date poor wrt effectiveness, efficiency, equity
 - Some other climate policies far more successful over that time
 - eg. Renewable energy policy in countries with intent & supporting frameworks
 - Free permits have demonstrated adverse impacts on technical innovation
 - *Poor government policy making clearly inadequate to scale & urgency of the climate challenge a recipe for deferred abatement investment by key incumbents & pressure for 'government' guarantees of more-or-less BAU*
 - We require far greater RD&D into range of sustainable energy technologies
 - Auction revenue a possible finance source for public funding
 - Private expenditure will be greatly influenced by view on government resolve for effective action on climate change
 - Most important innovation policies are for deployment of proven options
 - BAU 'orgware' will greatly delay effective action
 - Regulation best for some options – many energy efficiency opportunities
 - Targeted publicly funded deployment support for some options – renewables
- Good reasons to keep separate from ETS revenue - we need policy insurance against possible failure of ETS to deliver*

