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Economics of Climate Change
Comments on the Stern Review

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Tremendous accomplishment at the best timing

- Timing
- Quality
- Coverage
- Analysis and proposal based on Economics

- Different from IPCC Assessment Reports (policy prescriptive AND policy relevant)

Share the same view with

- Emphasis on Adaptation
- Stabilization at 450 ppmCO_2e is too costly
- Importance of establishing consensus on the stabilization level (not temperature) to achieve the ultimate objectives (Article 2, UNFCCC)
- Need to reduce global GHG emissions substantially in a long run
- Necessity to combine climate policy, technology policy and removal of barriers

Target level (comment 1)

Not quite sure about the target level

1) The current evidence suggests aiming for stabilisation somewhere within the range 450 - 550ppm CO2e. (Executive S. p.17) Does this include negative effect of sulfur aerosol? (E.S. says current level – is around 430 ppmCO2, p.3, whereas it is around 380 ppmCO2 if Sox included)
2) Stabilising at or below 550ppm CO2e --- by 2050, global emissions would need to be around 25% below current levels. (E.S., p.11)
3) An estimate of resource costs suggests that the annual cost of cutting total GHG to about three quarters of current levels by 2050, consistent with a 550ppm CO2e stabilisation level, will be in the range –1.0 to +3.5% of GDP, with an average estimate of approximately 1%. (p. 211)
4) The expected annual cost of achieving emissions reductions, consistent with an emissions trajectory leading to stabilisation at around 500-550ppm CO2e, is likely to be around 1% of GDP by 2050, with a range of +/- 3%. (p. 239)

Why the costs in 3) and 4) are almost the same?

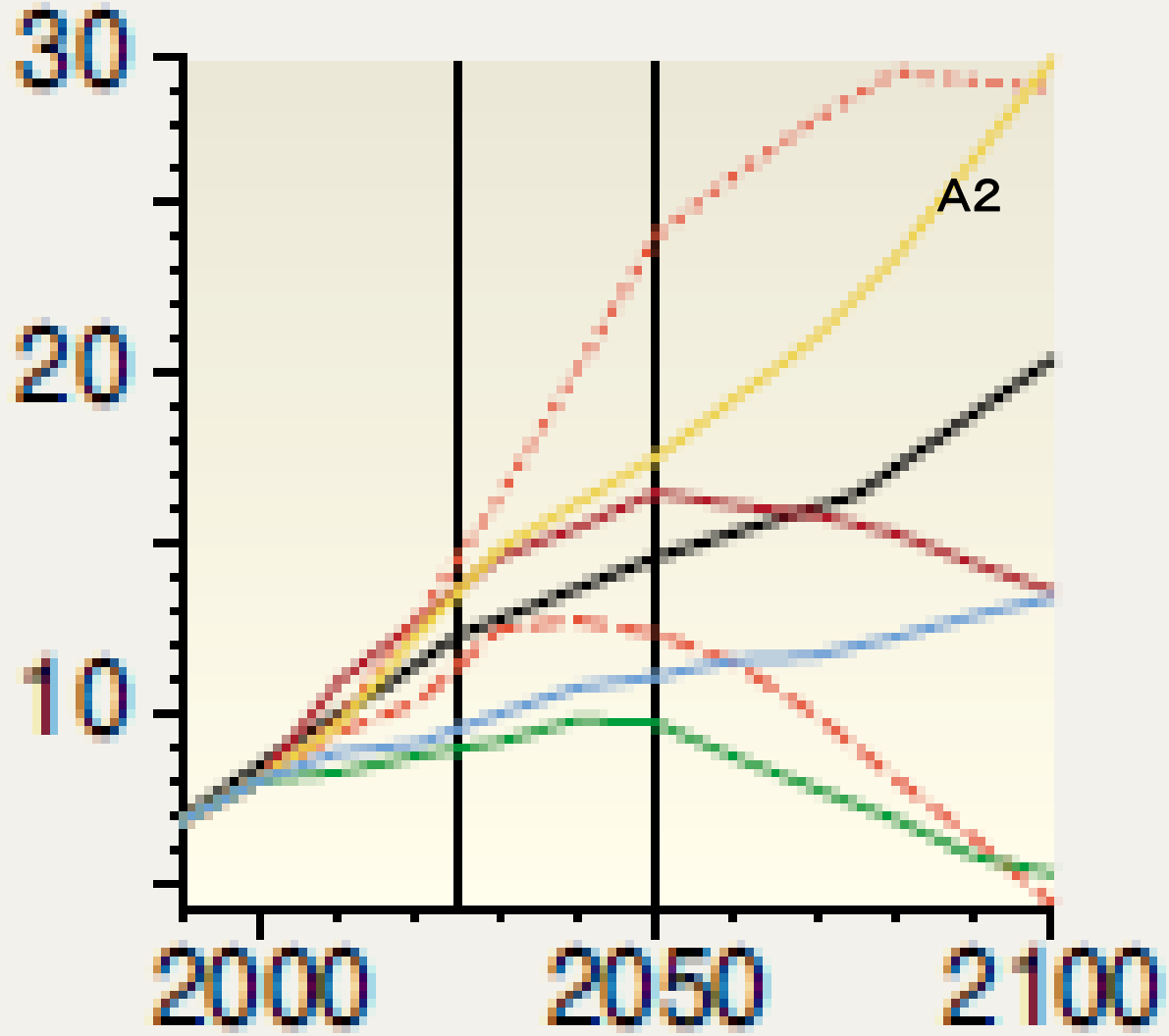
Damages (comment 2)

Isn't it too large?

- Baseline scenario (A2) with market impact and catastrophe (5.3% GDP loss in 2200, Figure 6.5, p. 157)
- High scenario with market impact, catastrophe, non-market impacts and more recent scientific findings (13.8% GDP loss in 2200, max. 35%)
- Take weighting into account (20% of GDP loss)
- Methodology of counting non-market values is not clearly described
- Same for methodology of weighting of damages among people (p. 163)
- PRTP is set at almost zero (or 0.1%) ref AR4

A2 Scenario

Stern Review p.154



Population in 2100 exceeds 15B.

IPCC TAR

Cost (comment 3)

Isn’t it too low (in comparison to AR4)?

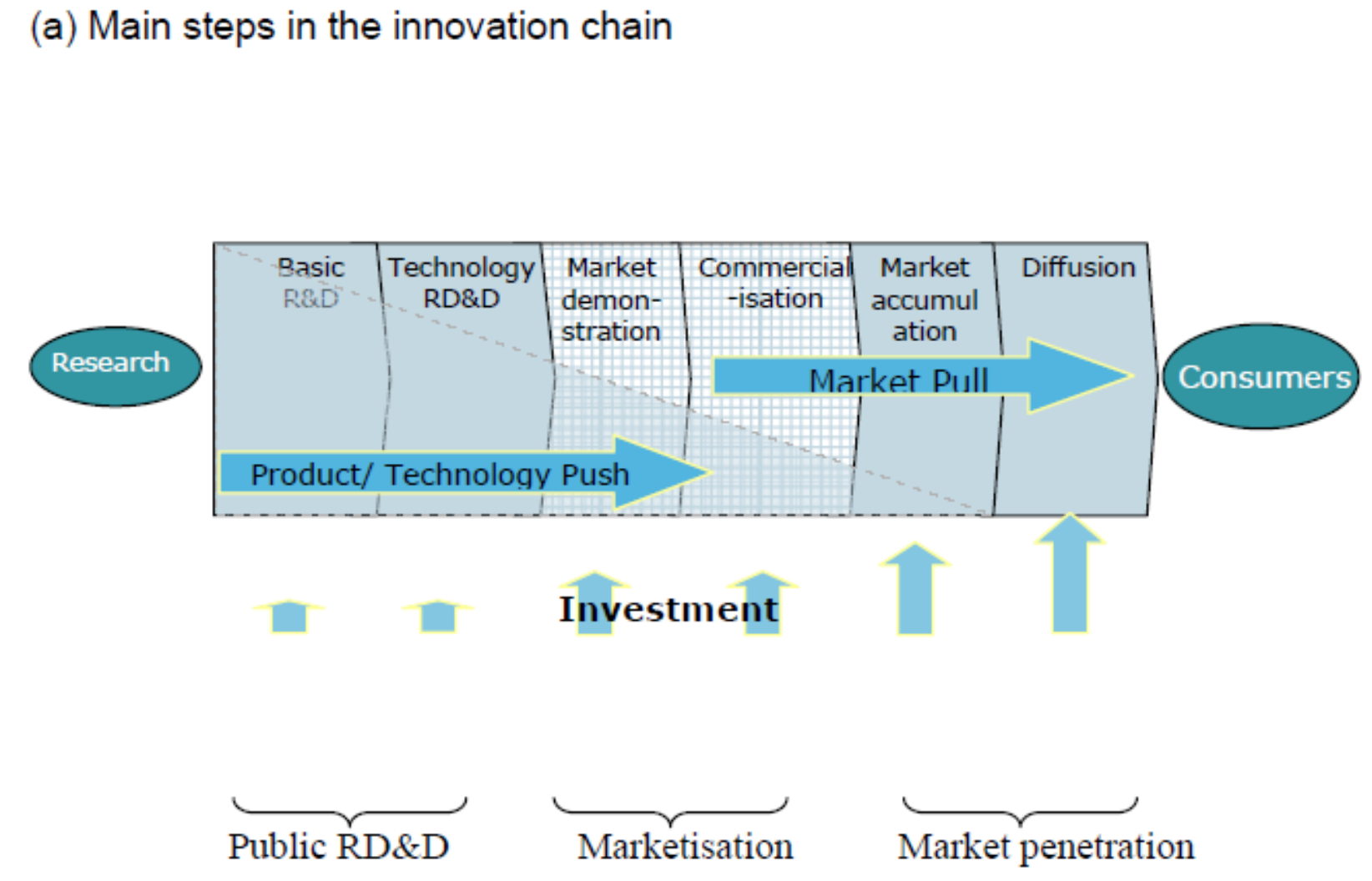
- A2 baseline scenario
- Calculation is based on globally rational world (p. 236). Where flexibility (p.242) and China.
- Cost depends on innovation/diffusion of technology (type and timing of technology, especially those in transport are not clear)
- Cost calculation (2050) and damage calculation (2200). MAC may become steeper after 2050.
- Model calculation is mainly based on T. Baker’s E3MG model that stresses the importance of ITC. Do we have any evidence?

Government R&D is absolutely necessary for substantial reduction globally

- Carbon pricing alone will not be sufficient (p. 308)
- Technology policy and removal of barriers should be accompanied
- Can private sector lead technology development?

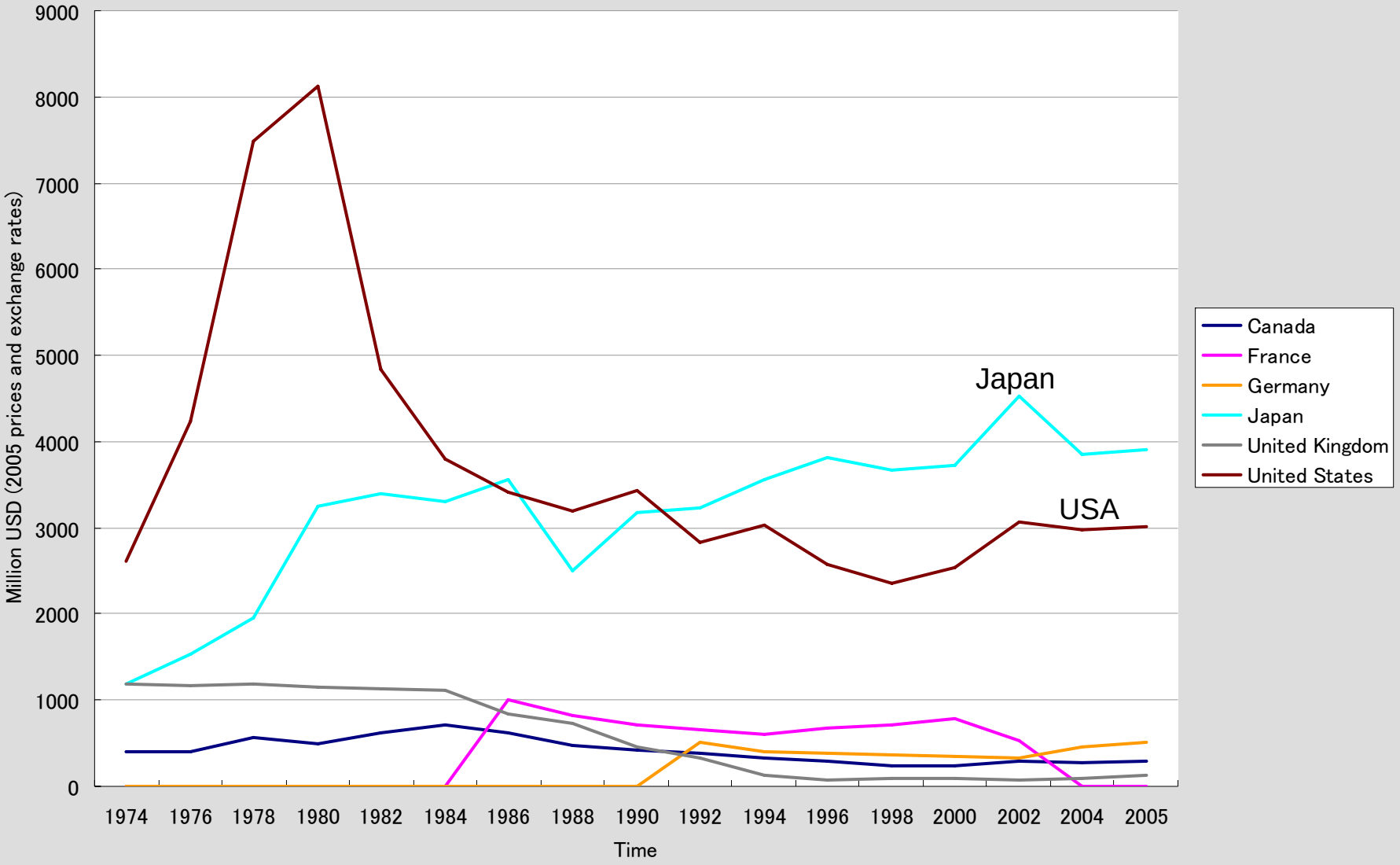
  Most of the development and deployment of new technologies will be undertaken by the private sector; the role of governments is to provide a stable framework of incentives (p. 360). But ---

  When looking forward over a period of several decades, however, there is also significant scope for surprises and breakthroughs in technology. This is one of the reasons why it is recommended that R&D and demonstration efforts are increase (p.229)



Grubb, M. 'Technology innovation and climate change policy: an overview of issues and options', Keio Economic Studies. Vol. XLI. No.2

Public R&D budget (energy-related)



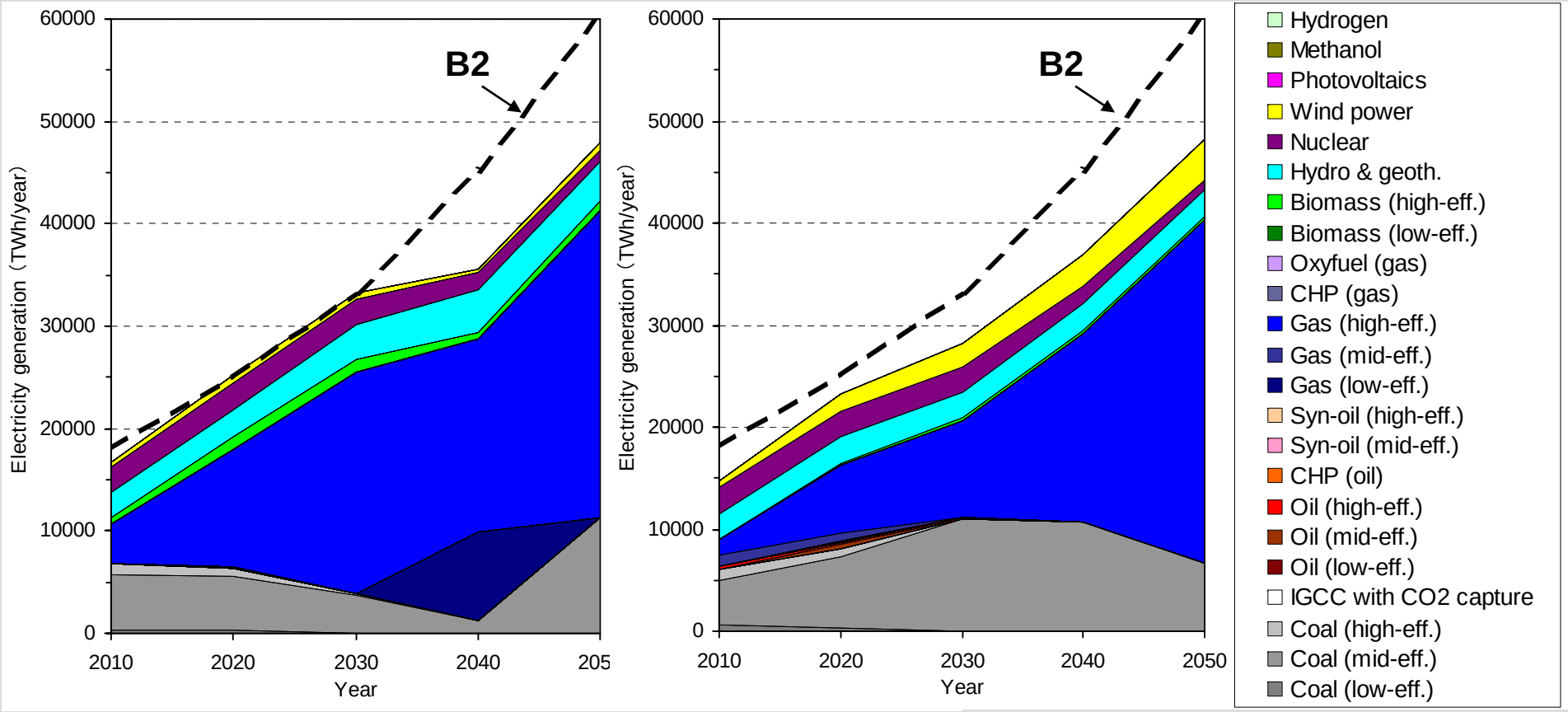
Source: IEA

Future Framework and Technologies

take example in global power generation sector

A series of short-term targets with the recursive opt. model

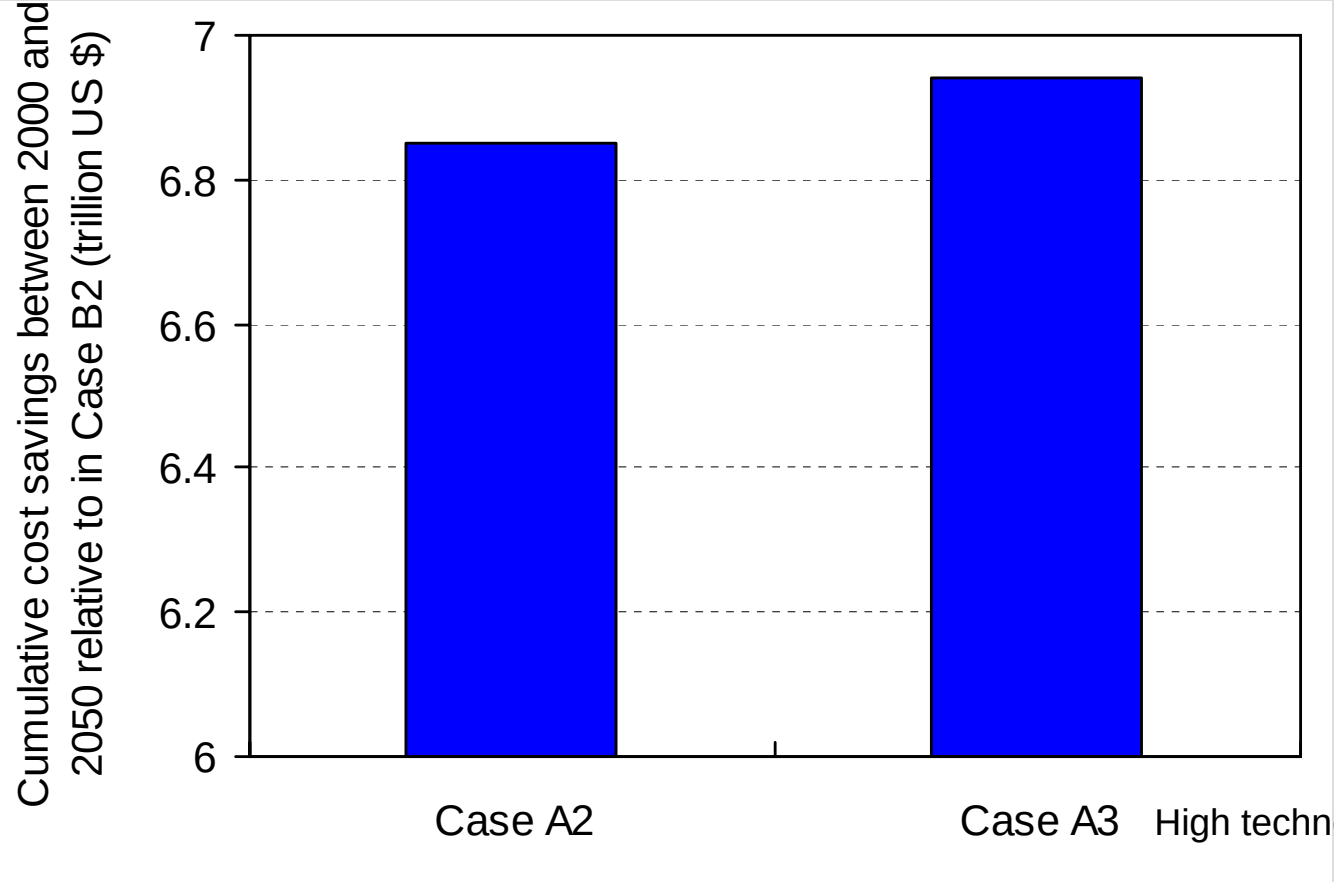
Long-term target with the inter-temporal opt. model



The long-term target will induce larger technology learning than the series of short-term targets. (Wind power is large in A2) **Source: Dr. K. Akimoto, RITE**

Cost Savings

Comparison with the series of short-term targets



Source: Dr. K. Akimoto, RITE

The long-term target will induce technology progress and achieve the same reductions at less costs than the series of short-term target.

Technology policy and future international framework

Global framework with long-term target is desirable

Priority issues

- Feasibility of global carbon tax and priorities of developing countries
- Climate change and energy security
- Climate change and MDGs