



# Why does the world need carbon planning?

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**Harald Winkler**

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Energy Research Centre



University of Cape Town

# Why carbon planning?

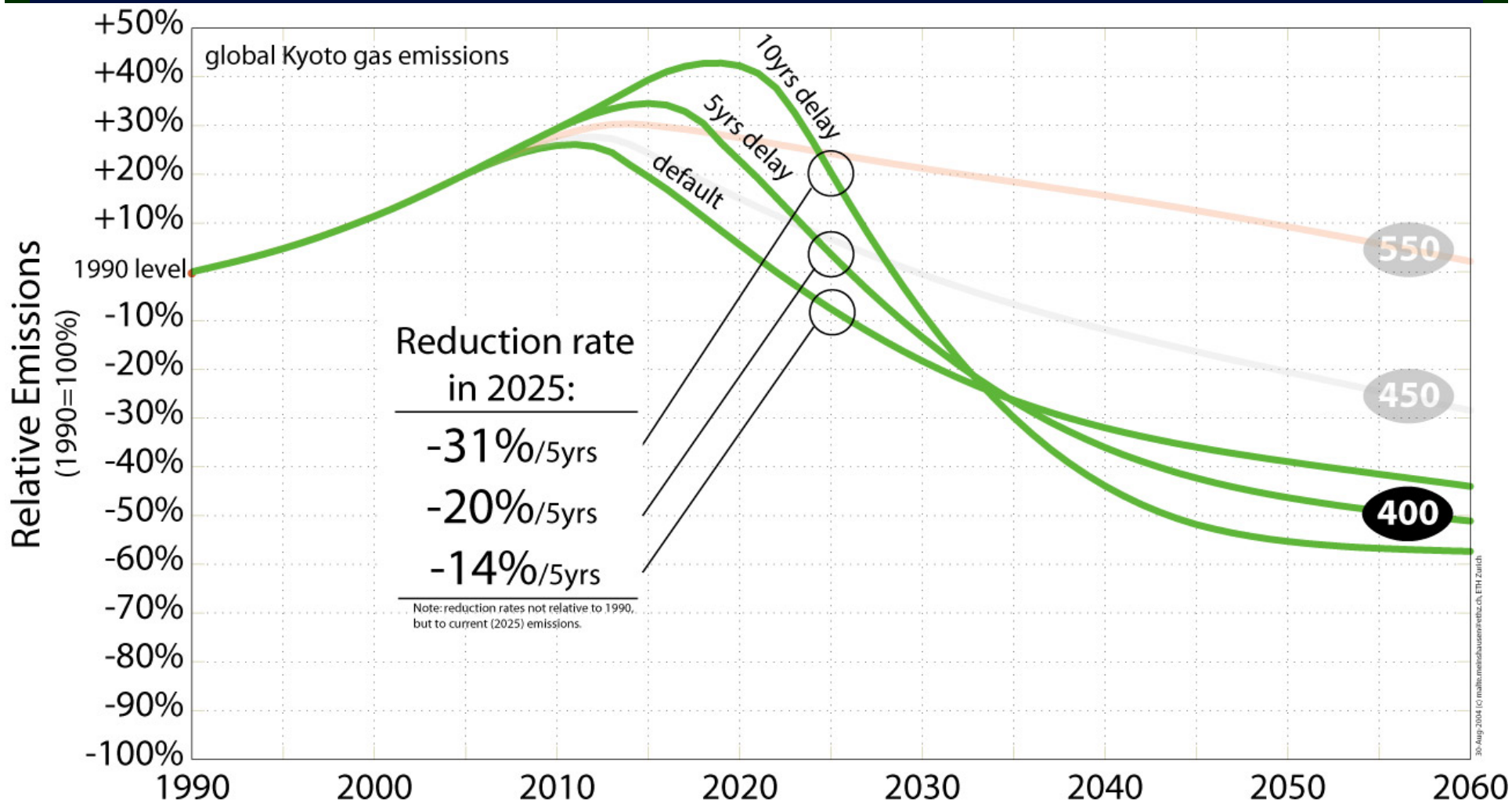


Because the science tells us so



# Mitigation is urgent time to bend the curve is short

*“It is clear that delaying action on this matter of climate change will hit poor countries and communities hardest” Pres Mbeki UN GA 2007*



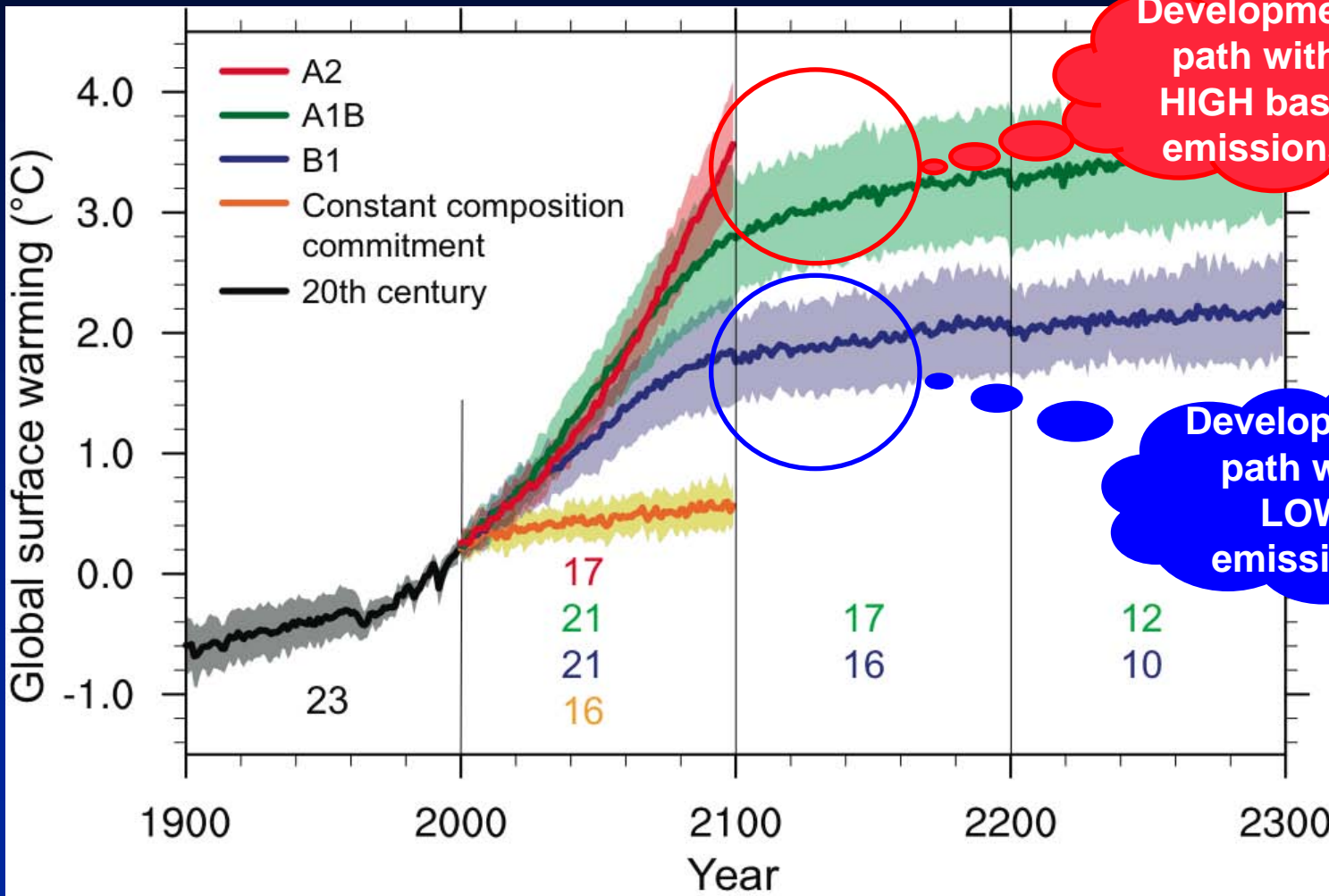
Note: (a) The S550Ce, S450Ce, and S400Ce stabilization scenarios are based on the EQW multi-gas emission pathways method, which builds on the gas-to-gas correlations within the pool of 54 SRES and Post-SRES scenarios (Meinshausen et al. submitted).  
 (b) Landuse CO<sub>2</sub> emissions are sharply decreasing in the default scenarios. If constant CO<sub>2</sub> emissions from the landuse sector were assumed, the emission reductions of the Kyoto-gases (fossil CO<sub>2</sub>, Methane, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>) have to be more pronounced. Alternatively, if emission allowances were given to avoided landuse emissions, overall emission allowances for the Kyoto-gases would have to be reduced accordingly (solid line).  
 (c) Delay profiles were calculated by assuming a 5 or 10 delay in global action. In the illustrative default scenarios, OECD and REF regions are assumed to enter stringent emission reductions by 2010, and ASIA and ALM by 2015.

# Why carbon planning?

## For balance

- Avoiding dangerous climate change
- Adaptation
- Clearly understand – all countries need to do more
  - all developed countries
  - binding absolute reductions
- Global carbon cycle
- Allowing development to proceed sustainably
- Mitigation
- Clearly understand – all countries need to do more
  - Including developing countries
  - Supported by technology and finance
- Plan for different future world – carbon-constrained

# Development path as important as specific climate mitigation policies



# We must plan

To “change the course of history”

Ban Ki-Moon, Bangkok climate talks

... and therefore take into account 3 key elements

**Policy**

**Technology**

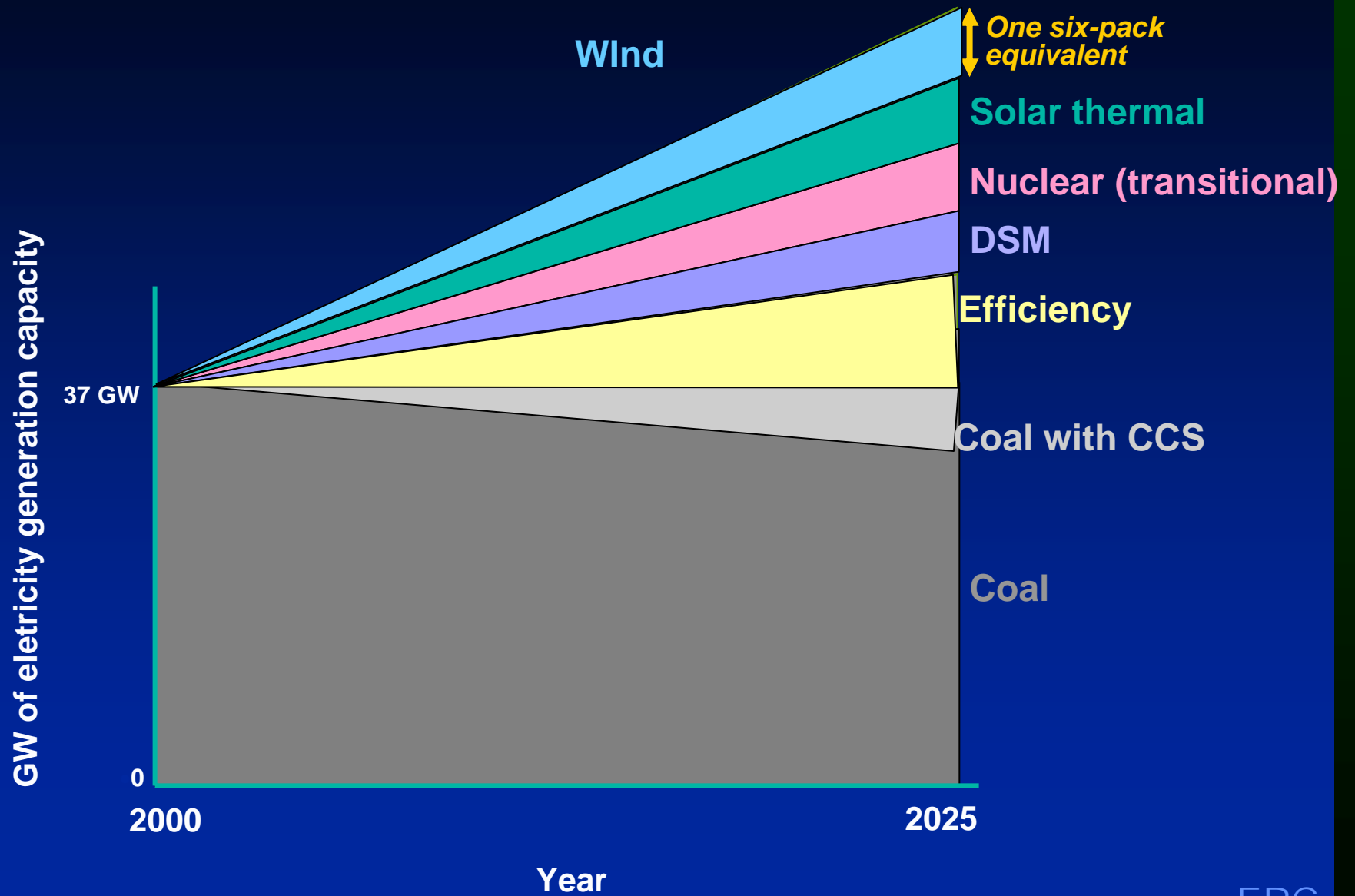
**Investment**

# Technology

- Governments not good at choosing winners
- No single silver bullet, but a portfolio
- Don't crowd out other technologies by putting all effort into a single one
  - If anything, skew the investments towards transformational technologies
- Consider scale - using the example of CCS



# Technology options in SA electricity sector



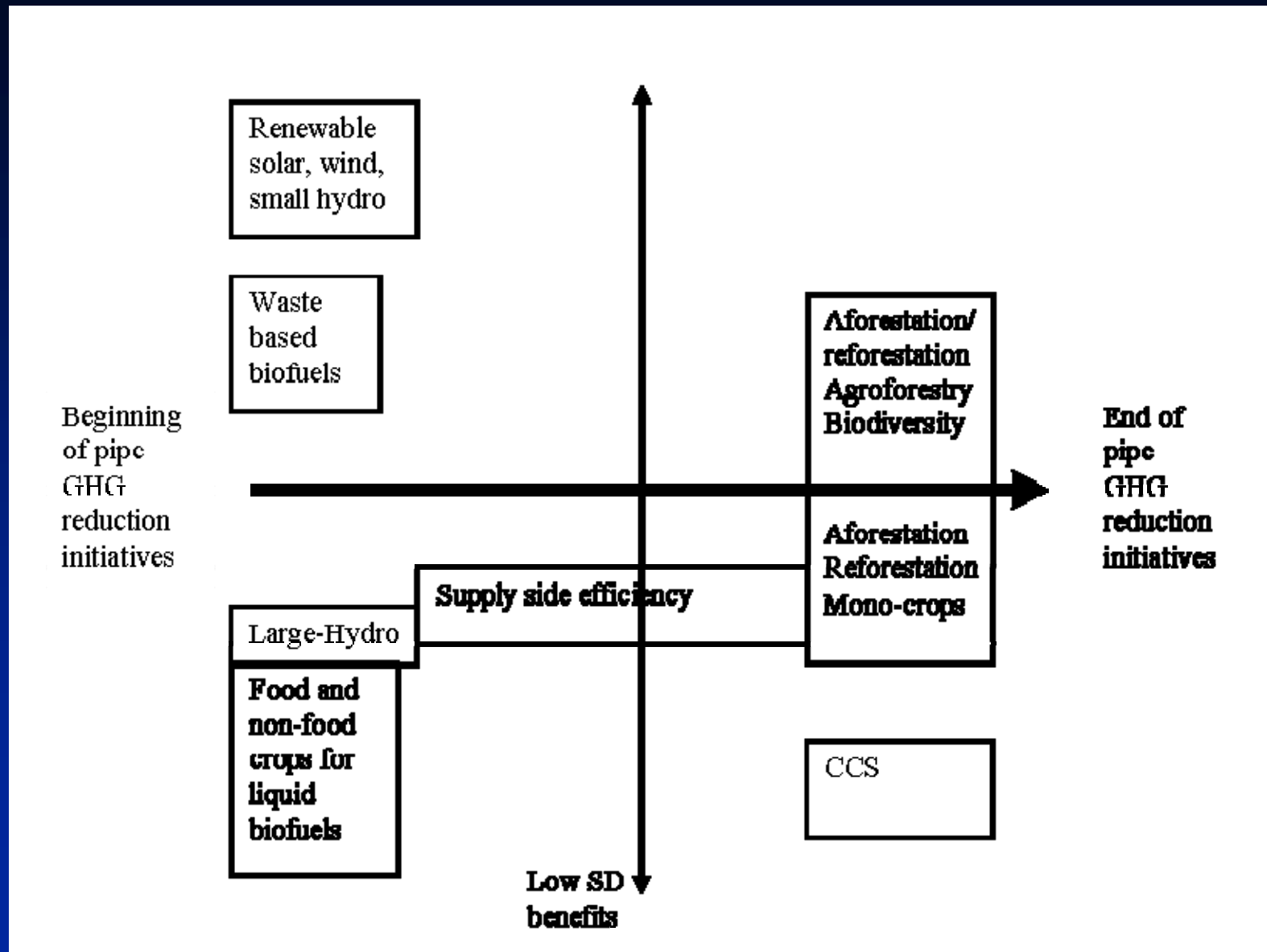


# Policy

- For developing countries – align with development
- Local, sustainable development
- International: measurable, reportable, verifiable
- Regulatory framework, addressing multiple issues, including at least effectiveness, permanence, M&V, environmental (geological, ocean)
- For SA, any new coal (power, CTL) subject to implementing CCS ?
  - At scale
  - SA requirement >10 times largest planned
- Does CCS contribute to local SD?



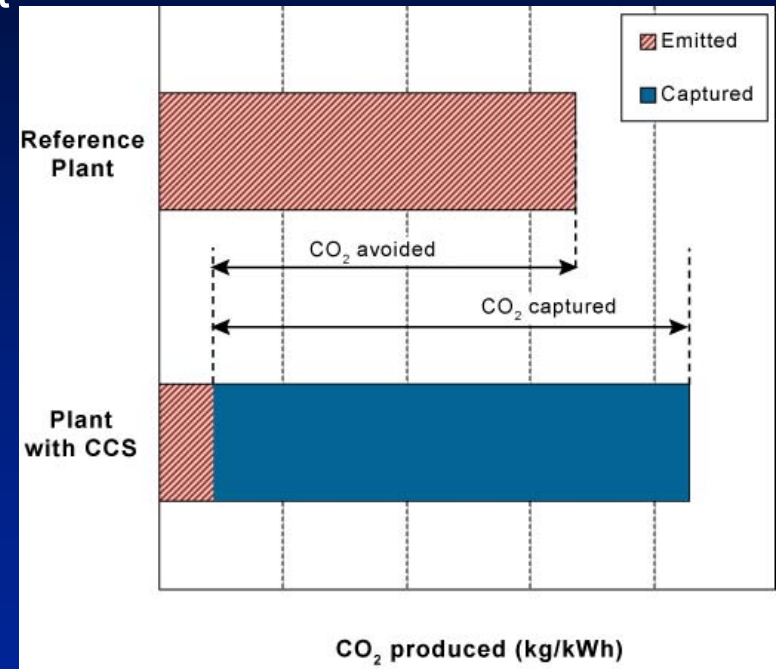
# CCS and sustainable development



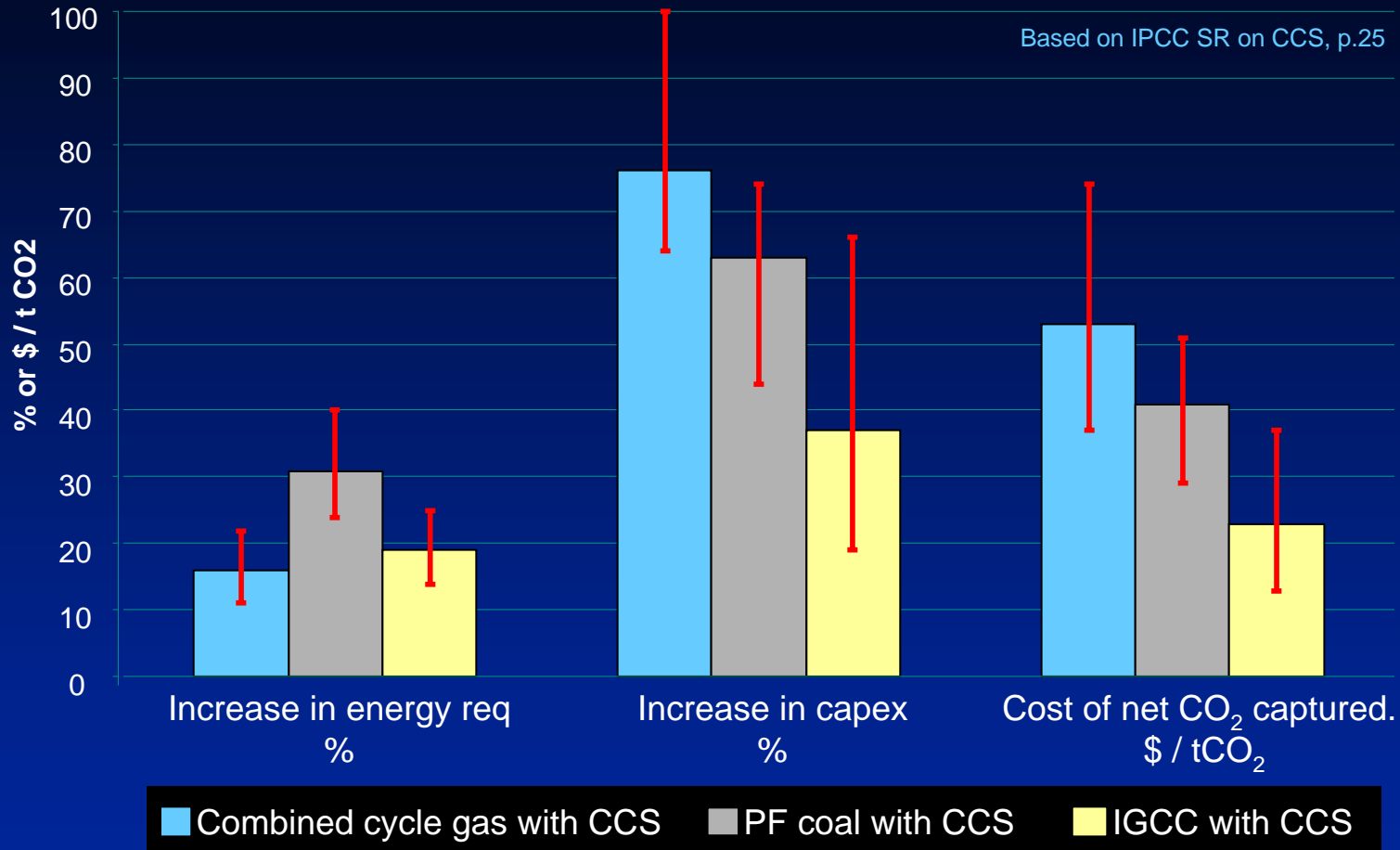
# Investment

- Public money – need to be clear about SCALE
  - SA concentrated CTL emissions alone > 10 times largest planned
  - And opportunity cost of investment

- Plan: fairly distribute costs
  - Across countries
  - Across technologies, e.g. for R&D, must be spread equitably
- Plan – wide range of uncertainty in CCS costs
  - Capture costs
  - Transport costs, matching sources and sites (< 300km)
  - Storage costs
  - Other – M&V, regulatory



# CCS on gas, PF coal and IGCC



- Wide ranges of uncertainty
- Increased energy, capital and mitigation costs

## Concluding remarks

- Need to plan to avoid dangerous climate change and keep balances
- Plan for technology: broad portfolio > single 'bullet'
- Plan for policy: align framework with sustainable development
- Plan for investment: fair distribution of costs
- In sum, plan for a transformation of our economies and societies
- "Time is few": Copenhagen Deal in 2009!

Thank you



# Costs of CCS

		% increase in energy	% increase in capex	Cost of net CO <sub>2</sub> captured \$ / tCO <sub>2</sub>
<b>Combined cycle gas with CCS</b>	Low	11	64	37
	High	22	100	74
	Rep. value	16	76	53
<b>PF coal with CCS</b>	Low	24	44	29
	High	40	74	51
	Rep. value	31	63	41
<b>IGCC with CCS</b>	Low	14	19	13
	High	25	66	37
	Rep. value	19	37	23

Data from IPCC Special Report on CCS, p.25