



# Climate Policy: Out of time

POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH



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# Five Key Messages

- *Climate risks are larger*
- *Emissions, temperature and sea level rise at top of IPCC range*
- *High oil prices and coal intensive development since 2000 point to risk of higher emissions unless urgent action taken*
- *Lowering emissions, lowers temperature and reduces risks and damages*
- *Limiting warming to 2°C and below critical to prevent dangerous climate changes*

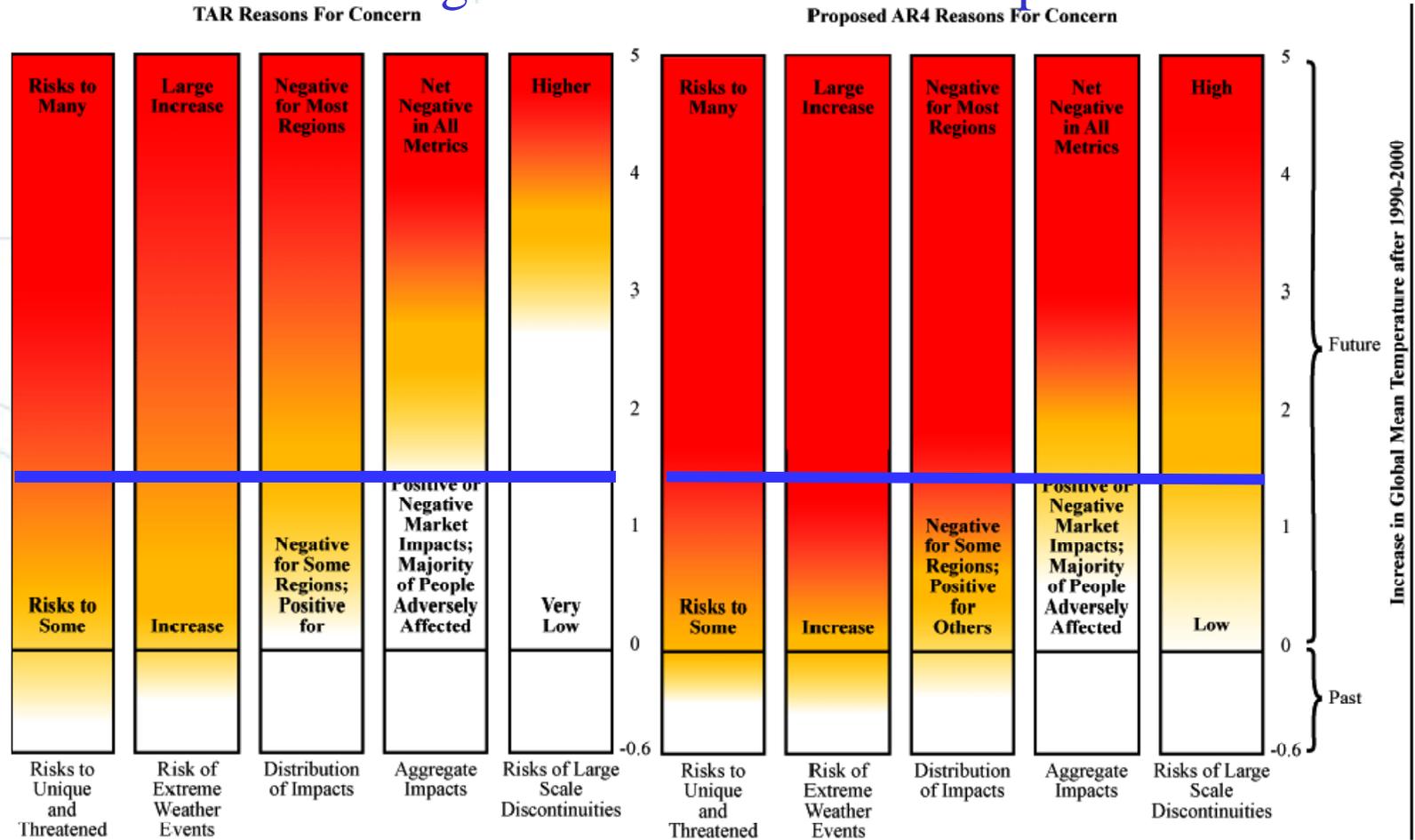


# 1. Climate risks are larger

## IPCC AR4 finds greater risks at lower temperatures

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2°C  
above  
1860

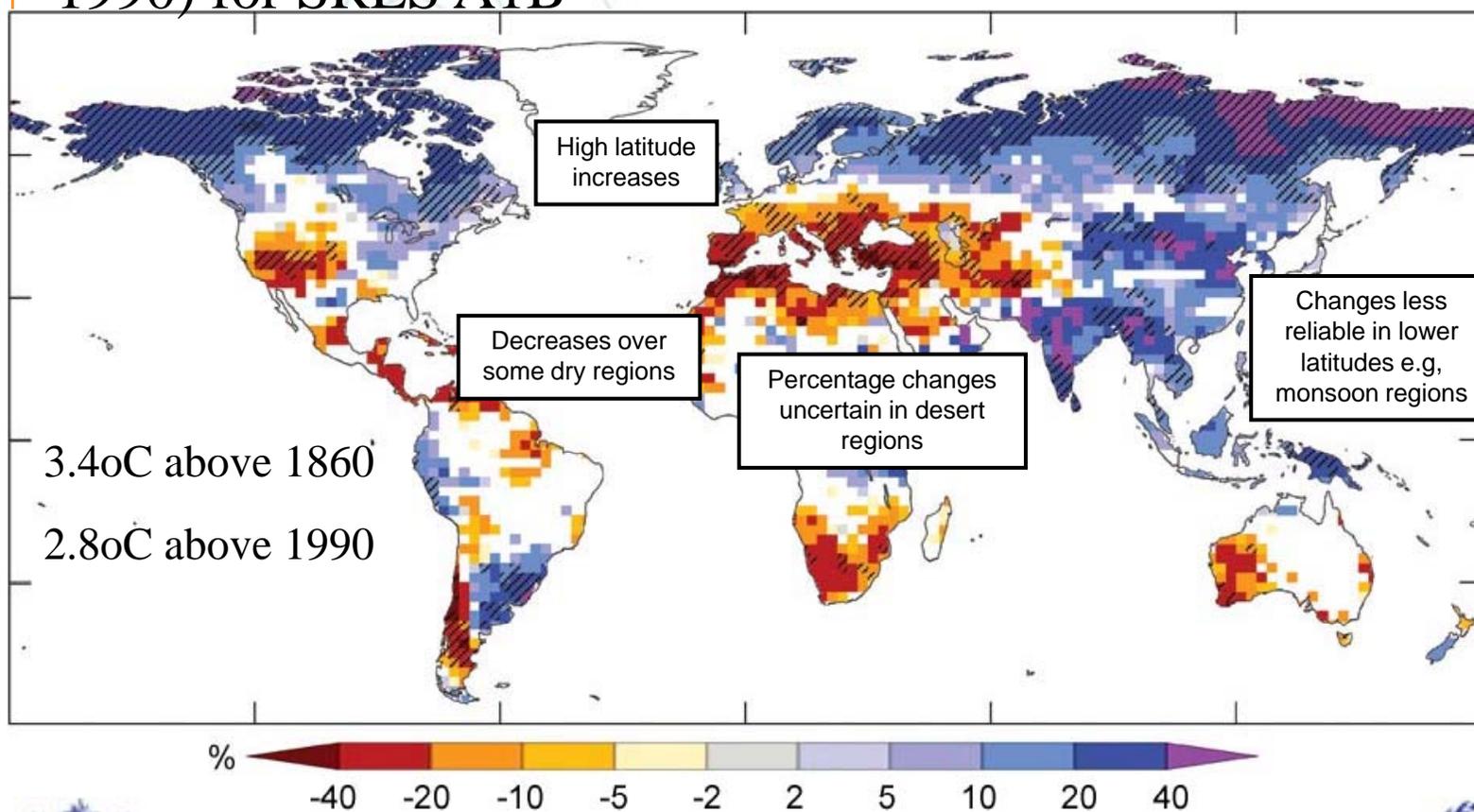


Source: Dangerous Climate Change: An Update of the IPCC Reasons for Concern, December 30, 2007: Smith, Schneider, Oppenheimer, Yohe, Hare, Patwardhan, Mastrandrea, Burton, Corfee-Morlot, Magadza, Fussler, Pittock, Rahman, Suarez, van Ypersele, in review PNAS



# Large water supply risks projected

Changes in runoff by the end of the 21st century (% of 1990) for SRES A1B



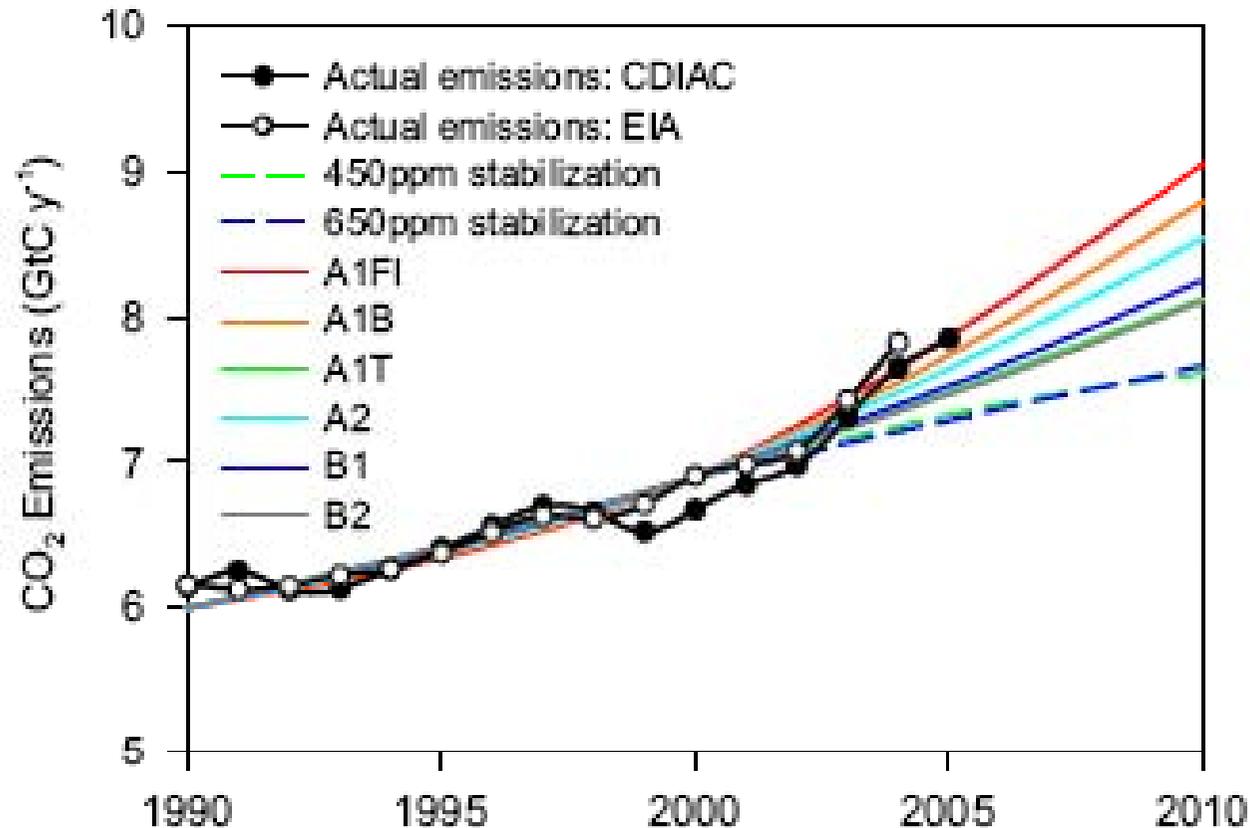


# Climate change and risks to sustainable development

- *Very likely* that climate change can slow the pace of progress towards sustainable development.
- Climate change could impede achievement of the Millennium Development Goals over next half century



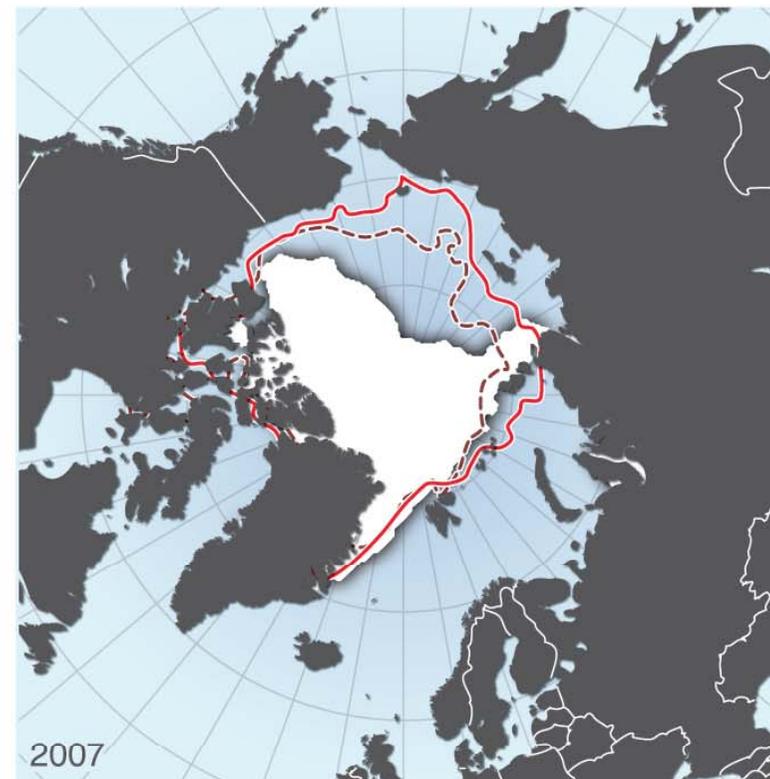
## 2. Emissions, temperature and sea level rise at top of IPCC range



Raupach, M. R., G. Marland, et al. (2007). "Global and regional drivers of accelerating CO<sub>2</sub> emissions." *PNAS*: 0700609104.



# Arctic sea ice loss faster than expected



Minimum extent of ice cover 2005

Median minimum extent of ice cover (1979-2000)

UNEP/GRID-Arendal, Arctic sea ice minimum extent in September 1982, 2005 and 2007, *UNEP/GRID-Arendal Maps and Graphics Library*, <http://maps.grida.no/go/graphic/arctic-sea-ice-minimum-extent-in-september-1982-2005-and-2007> (Accessed 24 April 2008)



# Observed negative effect on crops

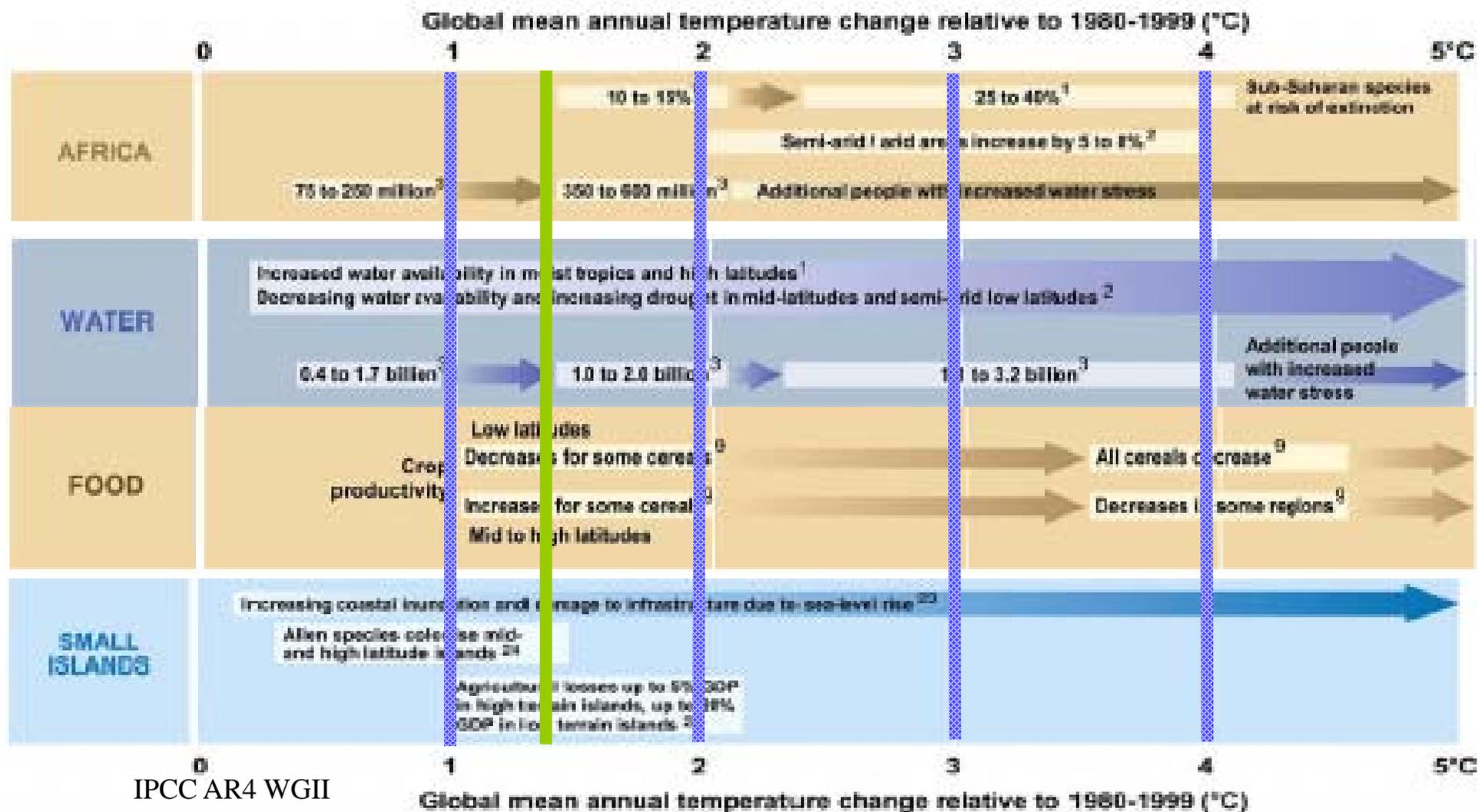
- “results suggest that recent climate trends, attributable to human activity... have had a discernible negative impact on global production of several major crops.”
  - Lobell, D. B. and C. B. Field (2008). "Estimation of the CO<sub>2</sub> fertilization effect using growth rate anomalies of CO<sub>2</sub> and crop yields since 1961." Global Change Biology **14**(2): 451-451.



### *3. High oil prices and coal intensive development*

- Oil price increases exacerbating trend towards increasing carbon intensity
- Price rises and energy security concerns driving investment in coal, coal/shale/tar to liquids, and carbon inefficient biofuels
- *High oil prices and coal intensive development since 2000 point to risk of higher emissions unless urgent action taken*

# 4. Lower emissions, lower temperature, reduced risks and damages



IPCC AR4 WGII

Table TS.4.



IPCC





## 5. Limiting warming to 2°C and below needs urgent global action

CO <sub>2</sub> -equivalent Stabilization level (2005 = 375 ppm CO <sub>2</sub> e)	Global Mean temperature increase at equilibrium (°C)	Global average sea level rise at equilibrium <u>from thermal expansion only</u>	Year global CO <sub>2</sub> needs to peak	Reduction in 2050 global CO <sub>2</sub> emissions compared to 2000
445 – 490	2.0 – 2.4	0.4 – 1.4	2000 – 2015	-85 to -50
Scenario category	Region	2020	2050	
A-450 ppm CO <sub>2</sub> – eq <sup>2)</sup>	Annex I	-25% to -40%	-80% to -95%	
	Non-Annex I	Substantial deviation from baseline in Latin America, Middle East, East Asia	Substantial deviation from baseline in all regions	

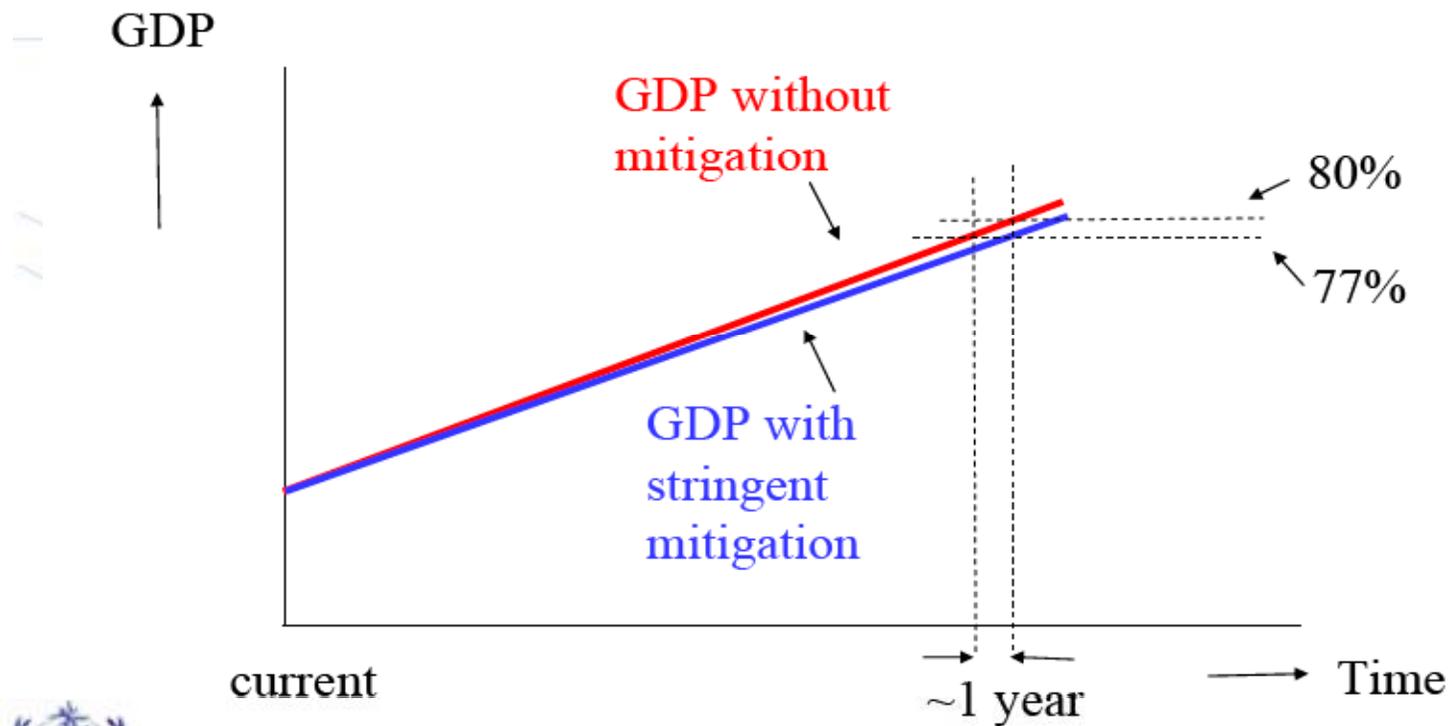
Source: IPCC AR4 Synthesis Report Table 5.1 and WGIII Chapter 13





# Costs

## Illustration of cost numbers





## *5. Limiting warming below 2oC*

- *Limiting warming below 2oC critical to prevent dangerous climate changes*
- *Urgent global action in near term*
  - *Global peak in emissions before 2020 and be reduced at least 50-85% below 2000 by 2050*
  - *Annex I reductions at least 25-40% from 1990 levels by 2020 and 80-95% by 2050*
- *The 2020 reductions need to be agreed at Copenhagen in 2009*