Scenarios of Climate Change

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Heraeus Seminar
Bad Honnef
26 May 2008

Tyndall (1863):

"The solar heat possesses the power of crossing an atmosphere, but, when the heat is absorbed by the planet, it is so changed in quality that the rays emanating from the planet cannot get with the same freedom back into space. Thus the atmosphere admits the entrance of the solar heat but checks its exit, and the result is a tendency to accumulate heat at the surface of the planet."

Inhalt

- Carbon Cycle
- Radiative Forcing
- Observed Climate Change
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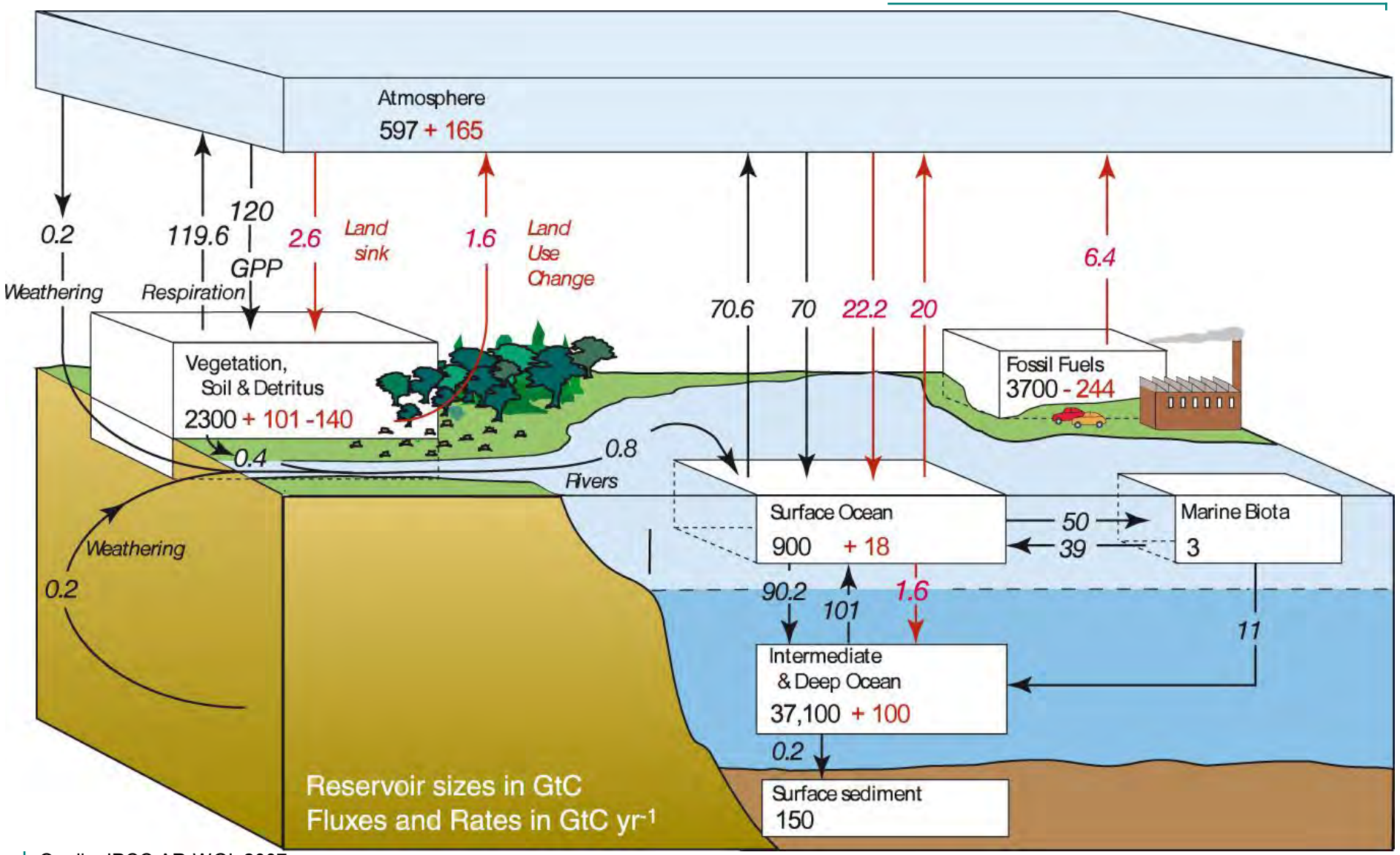
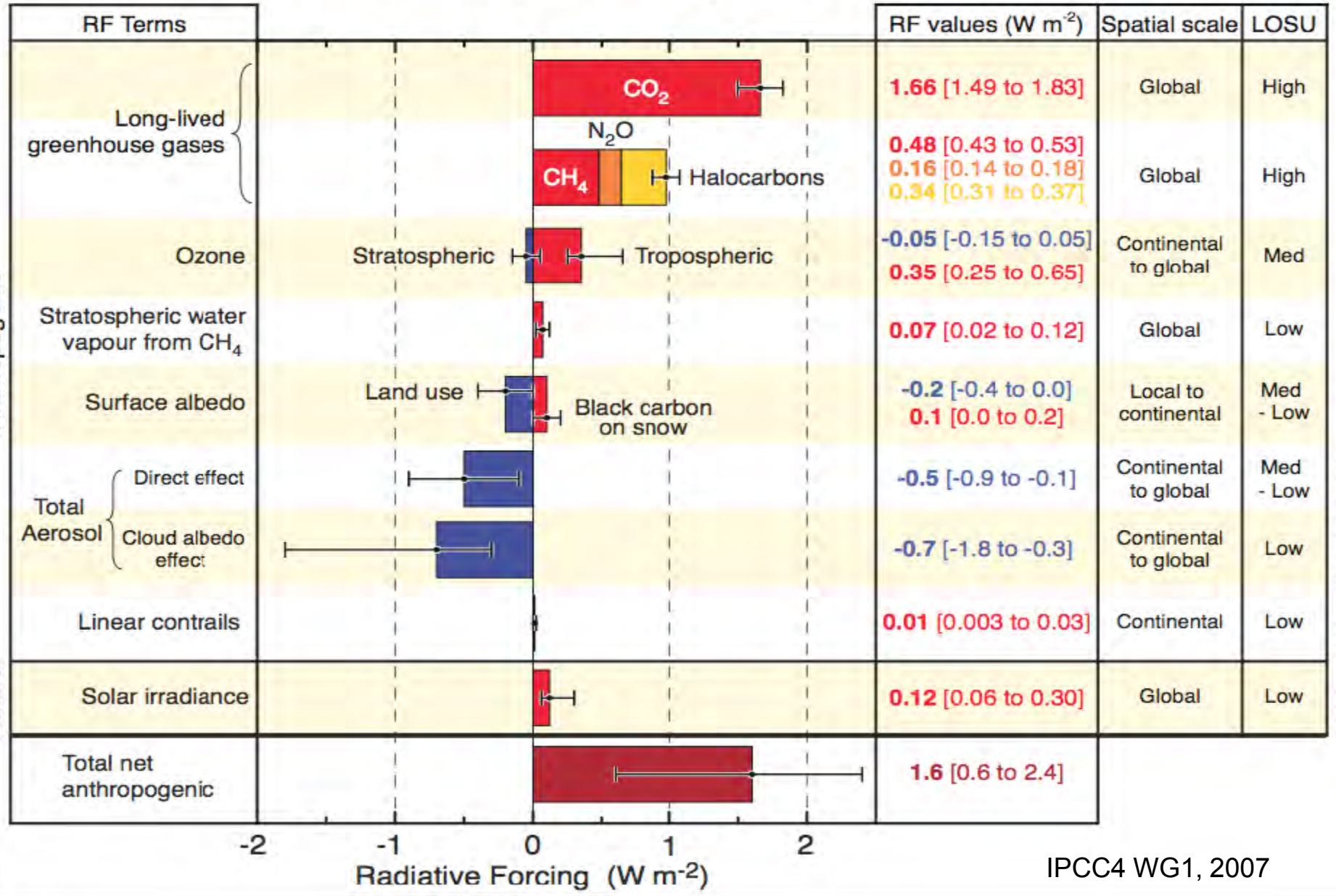
- Conclusions

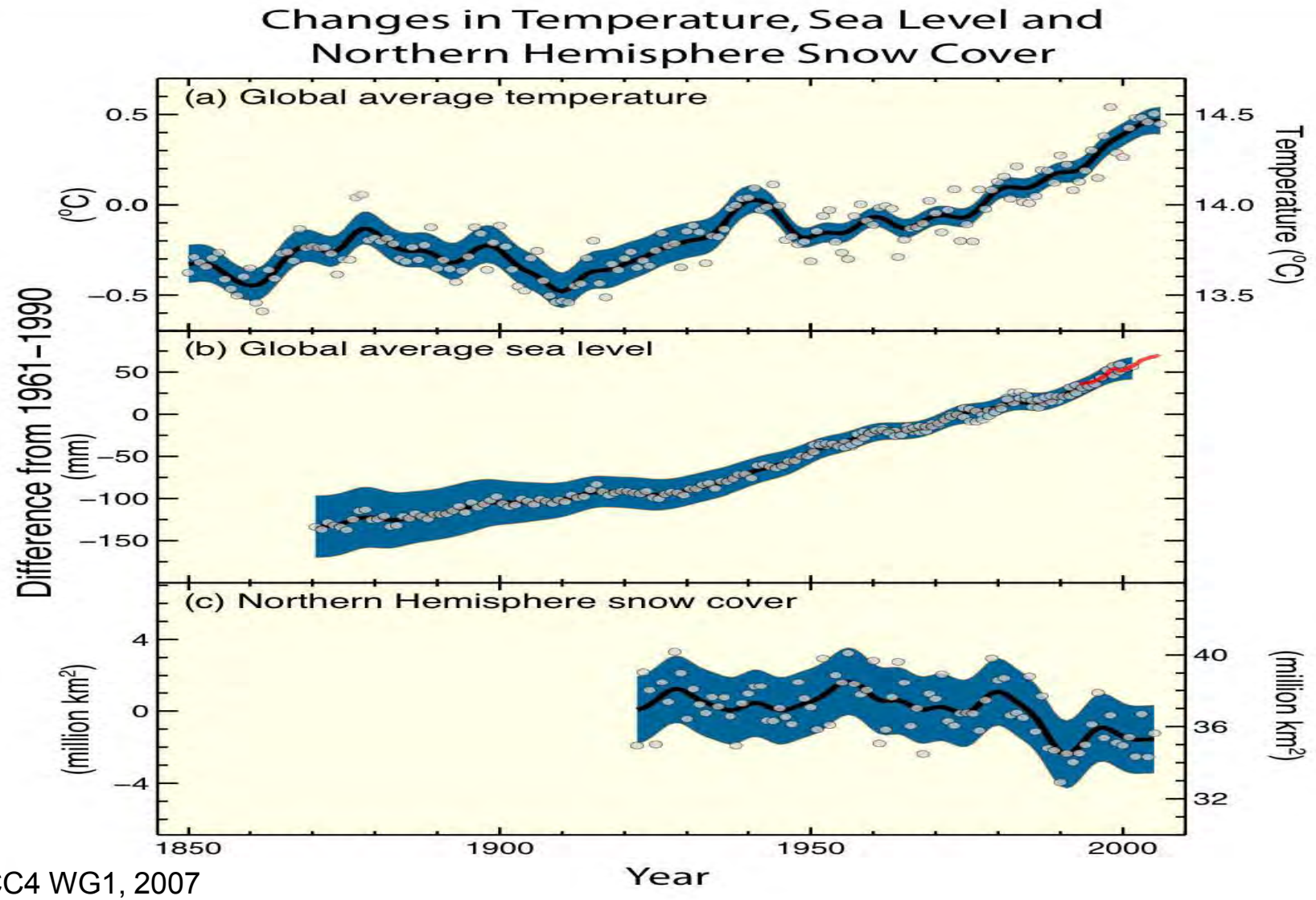


Quelle: IPCC AR-WGI, 2007

Radiative Forcing Components



IPCC4 WG1, 2007



IPCC4 WG1, 2007

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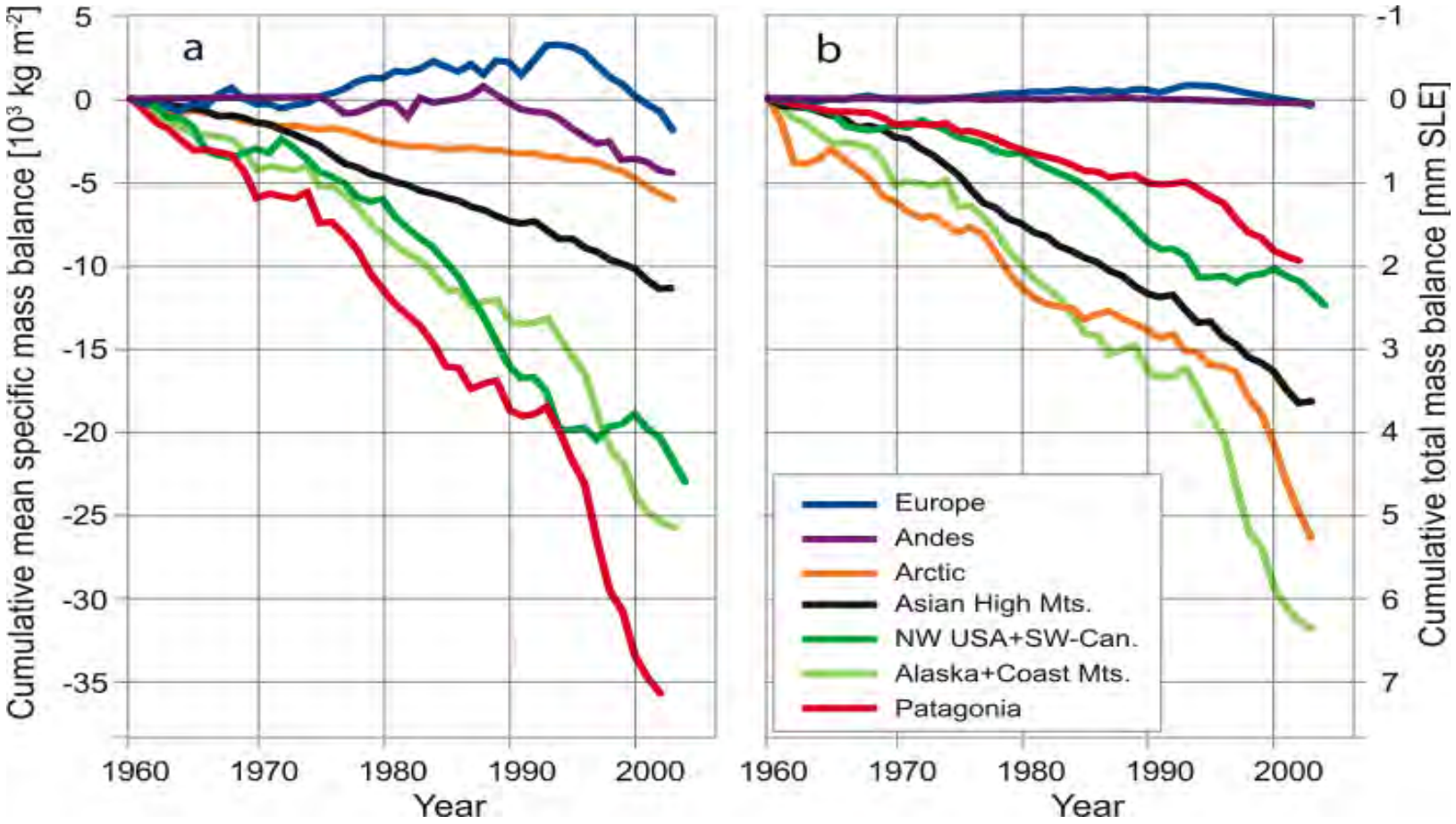
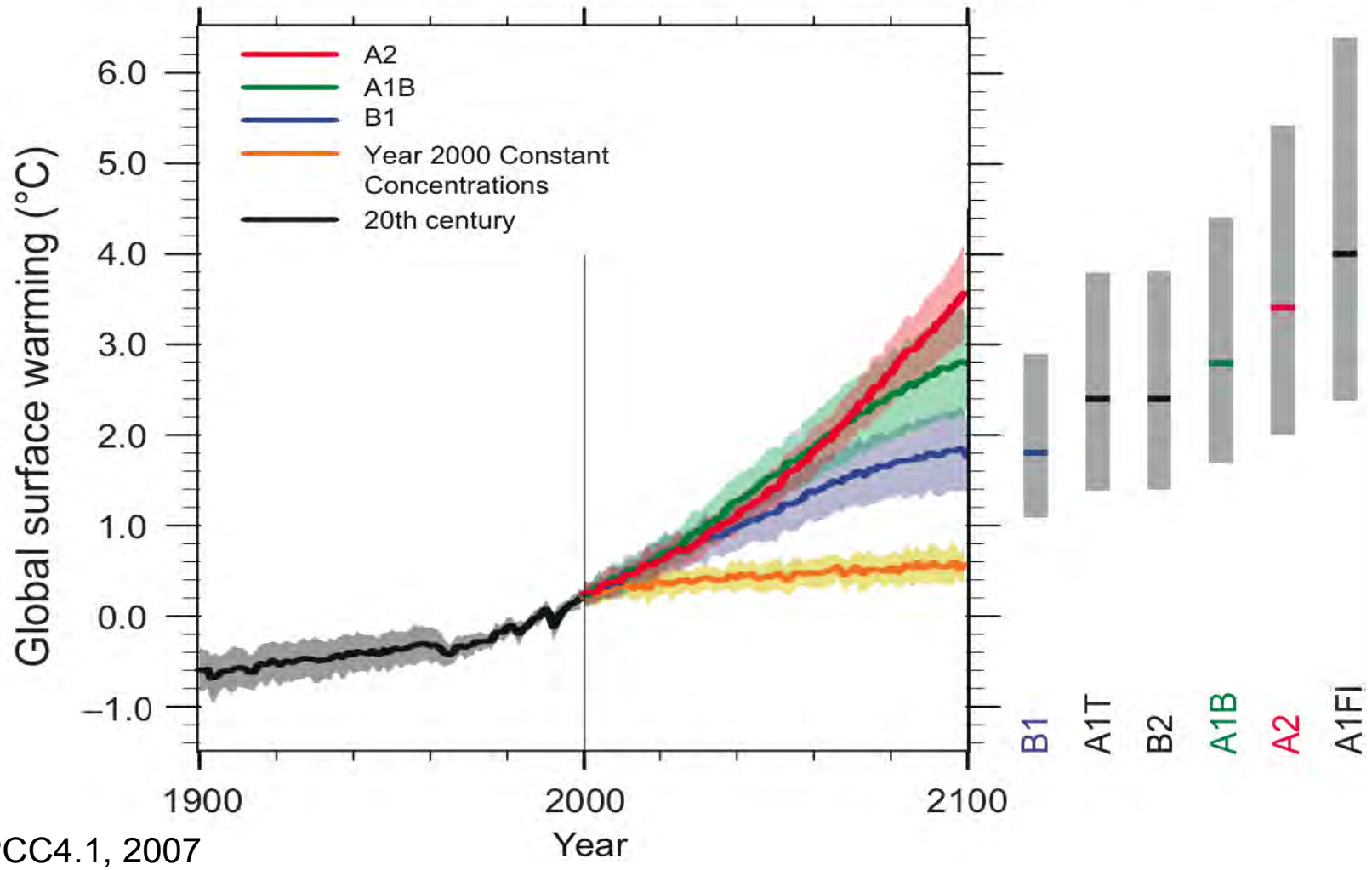


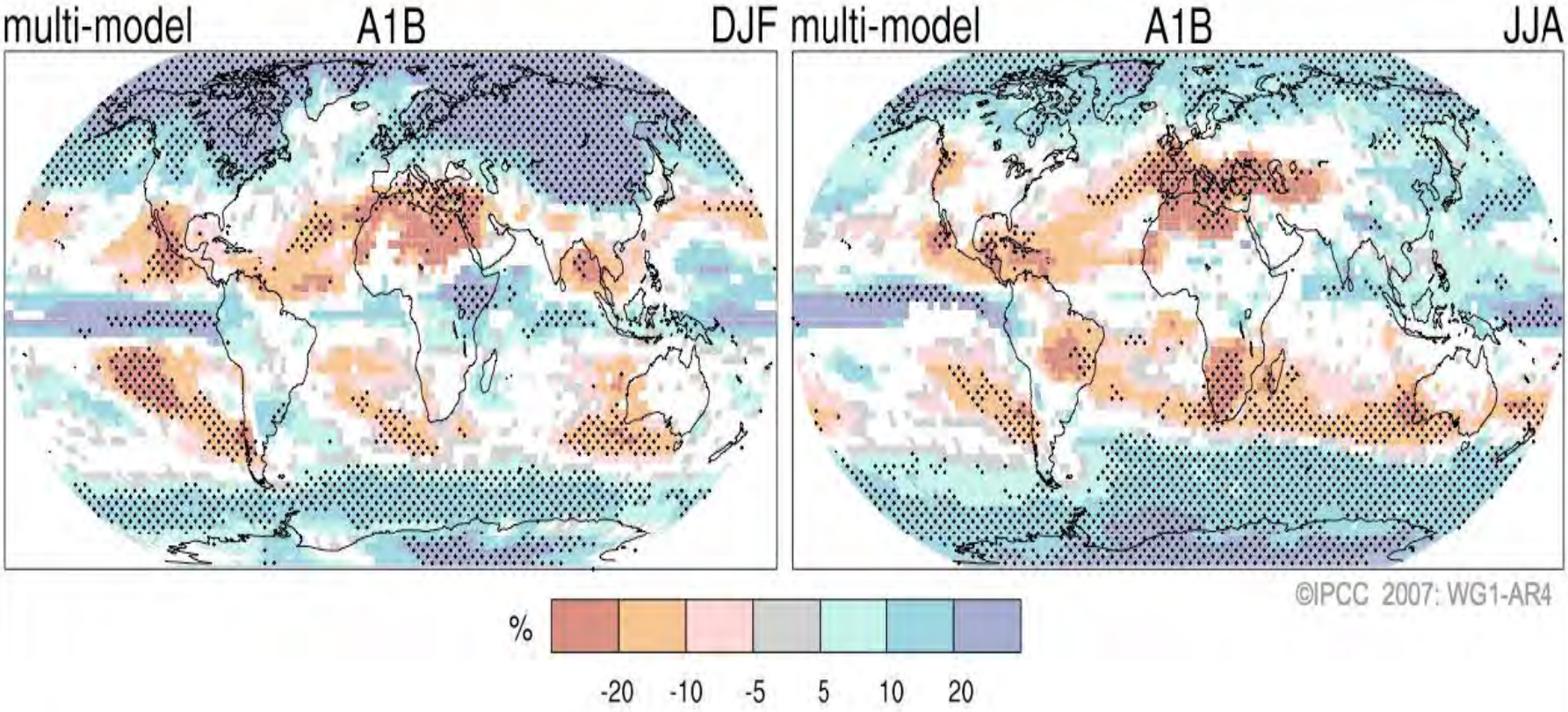
Figure 4.15. *Cumulative mean specific mass balances (a) and cumulative total mass balances (b) of glaciers and ice caps, calculated for large regions (Dyurgerov and Meier, 2005). Mean specific mass balance shows the strength of climate change in the respective region. Total mass balance is the contribution from each region to sea level rise.*

Multi-model Averages and Assessed Ranges for Surface Warming



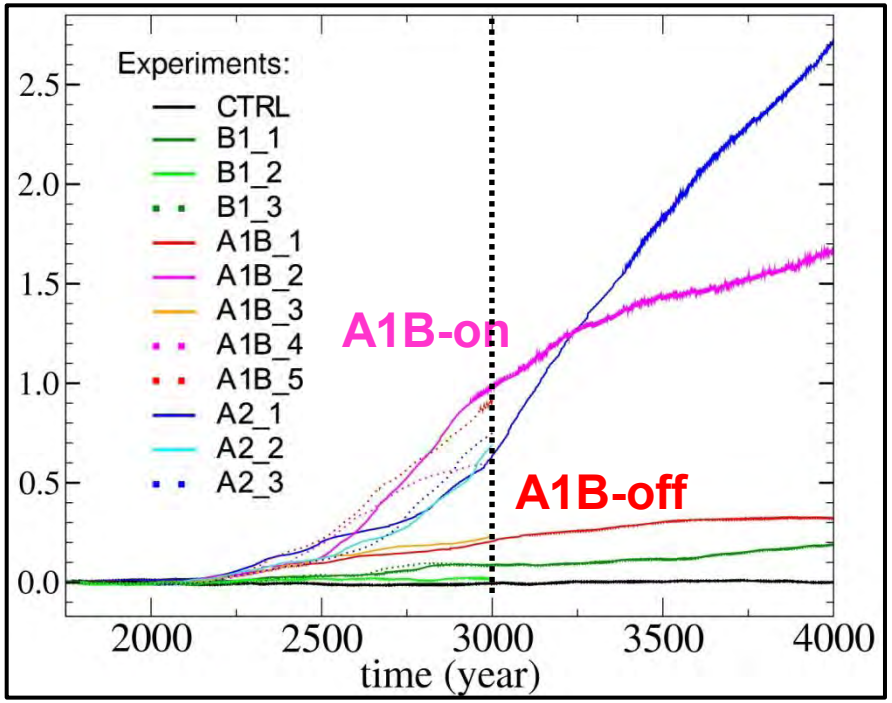
IPCC4.1, 2007

Projected Patterns of Precipitation Changes



Evolution of GrIS

Contribution to sea level change [m]



Quelle: Miren Vizcaino (2006)

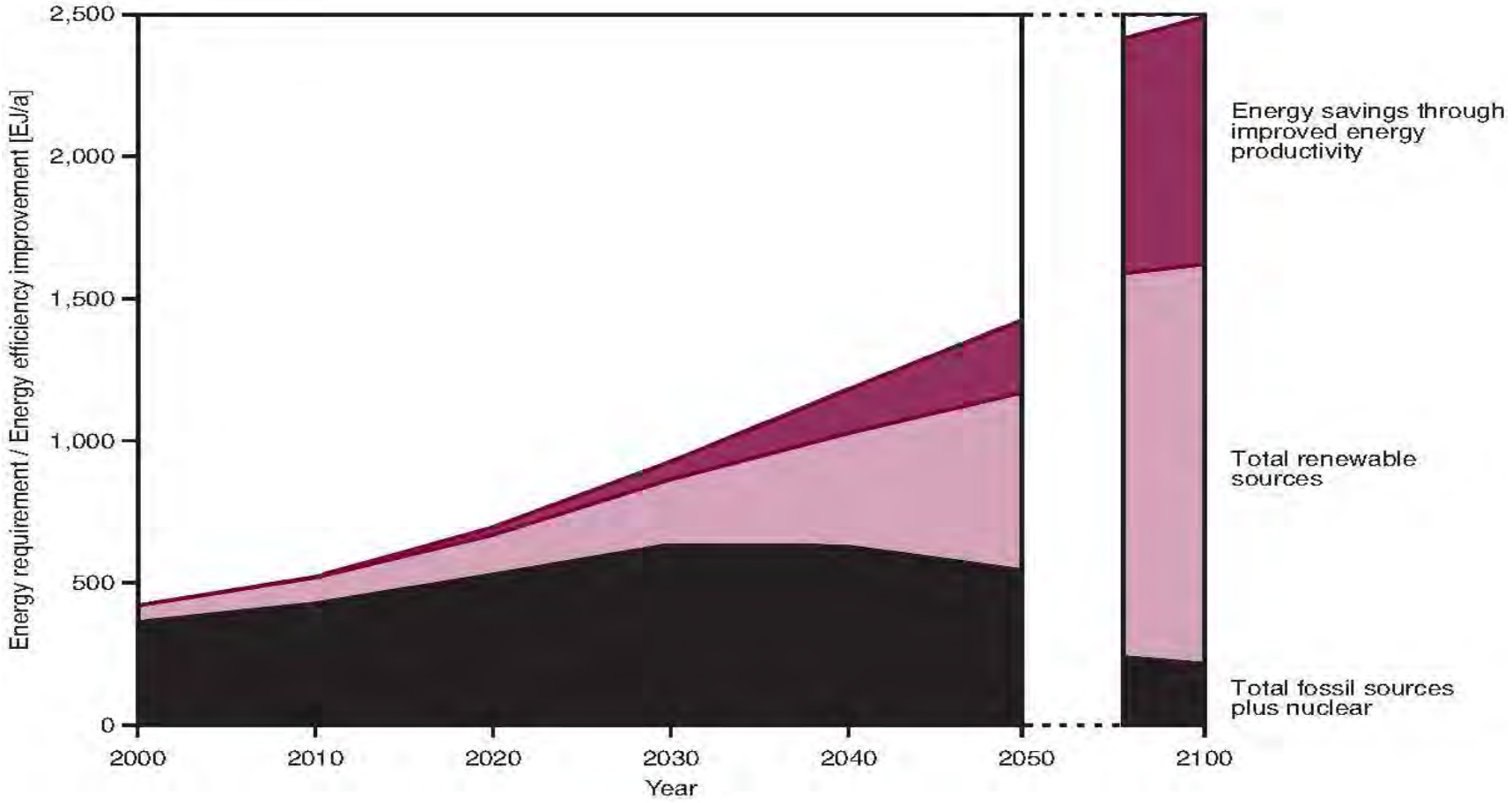
Conclusions

- End of fossil fuel use before exhaustion of fossil fuels
- Innovative countries have to take the lead
- European Council has set binding goals for 2020:
  20% endenergy from renewables
  20% rise in efficiency
  20% reduction of CO_2 emissions (base year 1990)
  (30% reduction if others join)
- COP13 decision on Bali:
  - integration of emerging countries
  - CO_2 reduction by 25 to 40% for industrialized countries
  - adaptation in developing countries partly financed by revenues from emissions trading

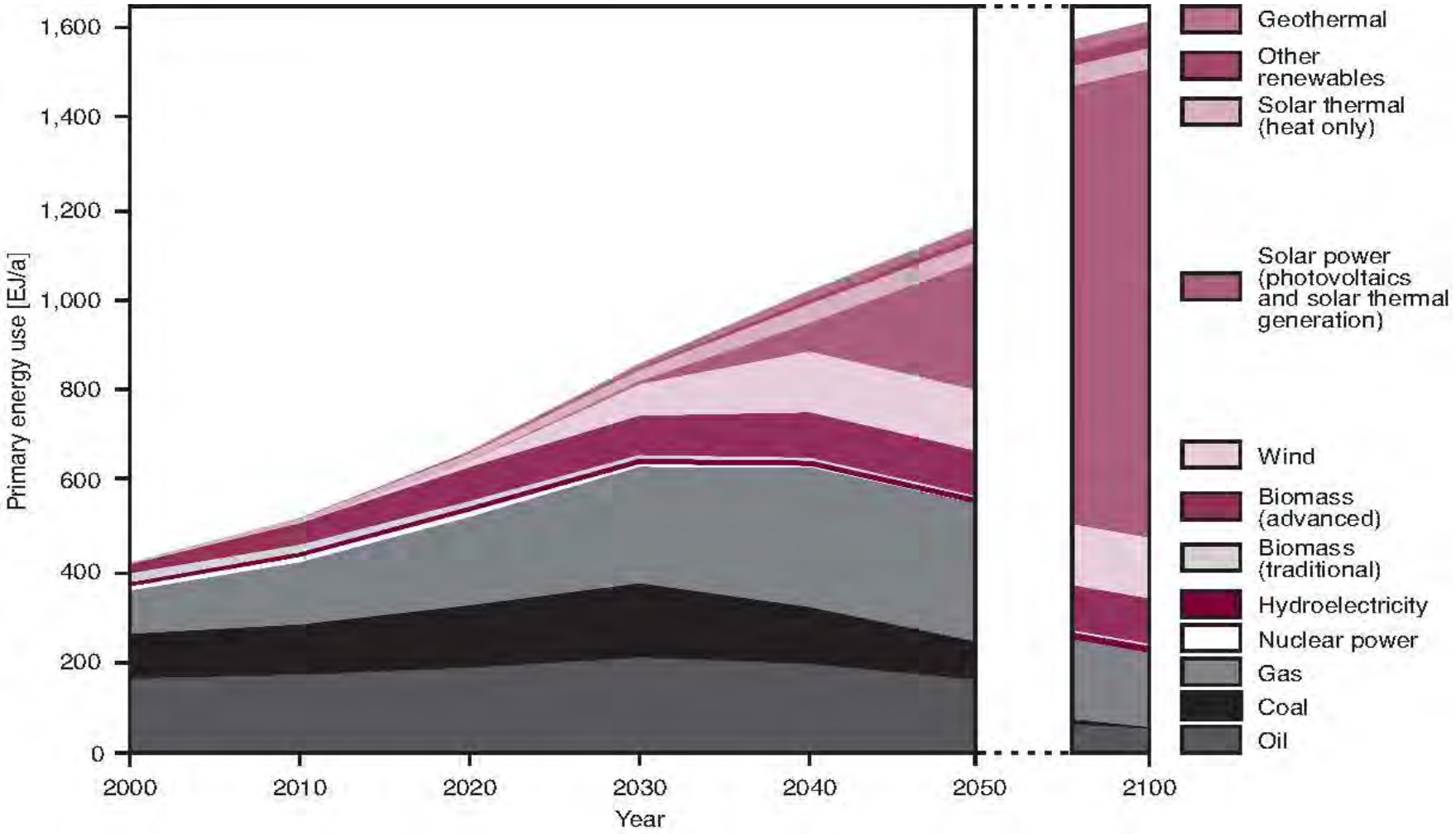
IPCC Working Group II ‚Vulnerability and Adaptation‘

Without climate policy 20 to 30 percent of all known species will be threatened by extinction until the end of the 21st century..

The two largest environmental problems are closely linked.

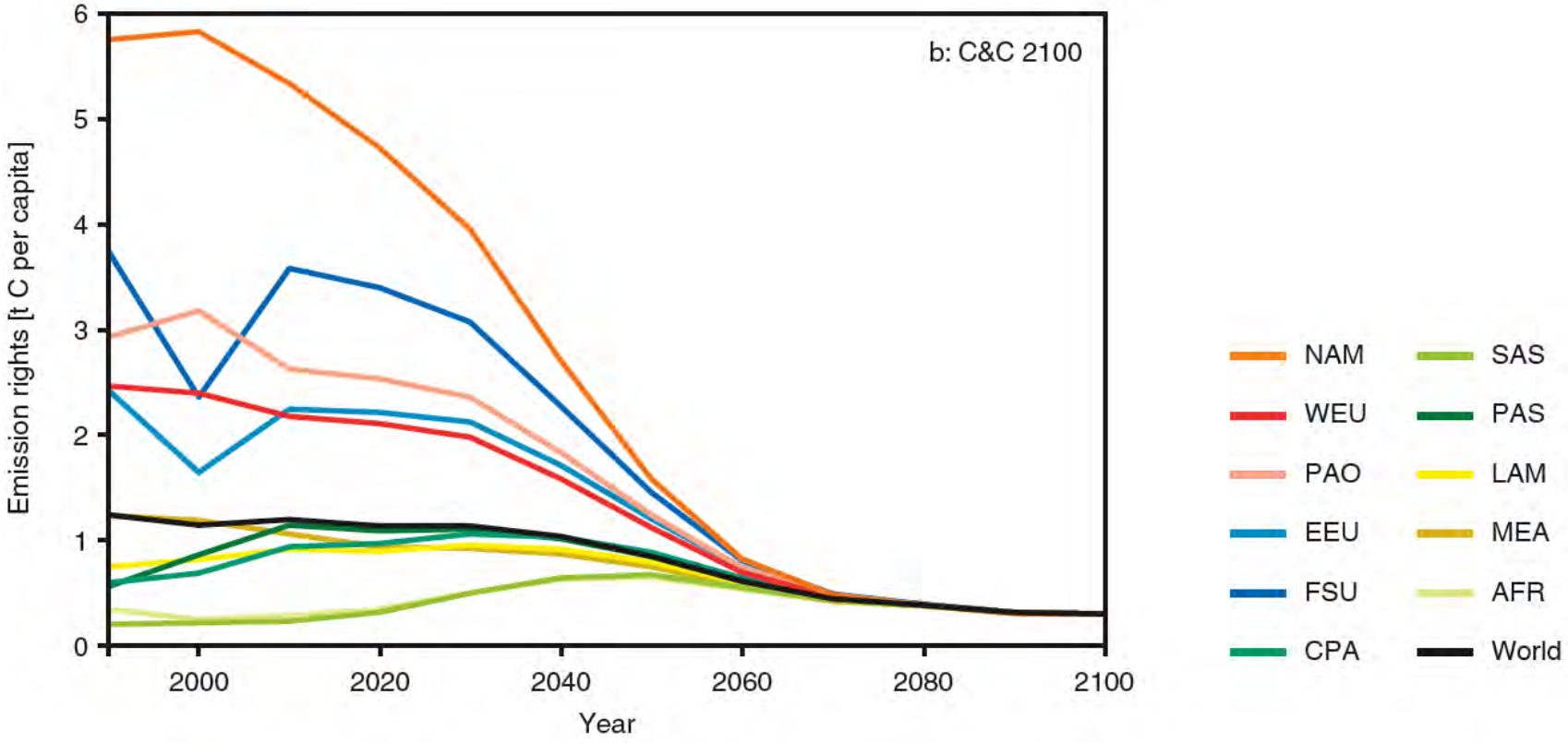


Source: WBGU, 2003



Source: WBGU, 2003

Burden sharing : „Contraction and Convergence“



Development of per-capita emission rights under contraction and convergence in scenario A1T*-450 with years of convergence 2050

WBGU (2003)

Until 2050 we have to learn
how to use one fivethousandth
of Sun‘s offer for then about
9 billion people.

Thank You