

Responding to Climate Change
Housing and Health Programme
University of Otago, Wellington
19 February, 2014

Climate Change - Where is the thinking at now?

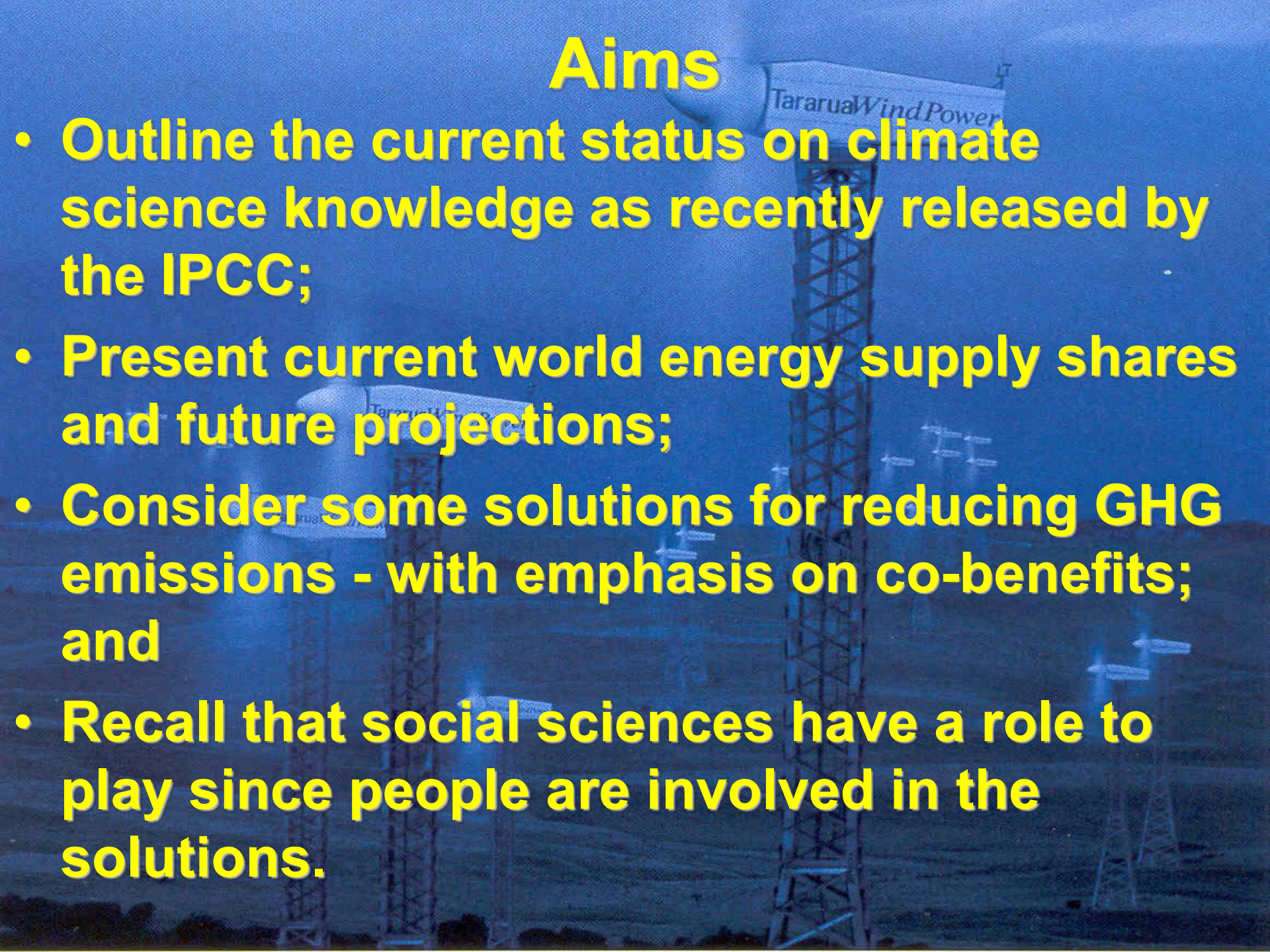
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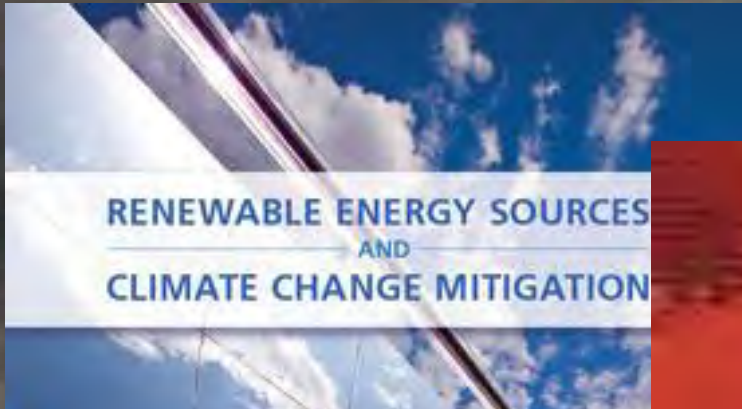
Global issues that impact on the environment

- Population growth and improved health demands.
- Growing middle class in emerging economies.
- Financial crisis and donor countries.
- Loss of biodiversity.
- Land use competition, degradation, soil and deforestation.
- Impacts of chemical use and plastics.
- Energy supply security.
- Food supply security.
- Clean water scarcity.
- The moves towards Sustainable cities.
- Climate change impacts and sustainable development.

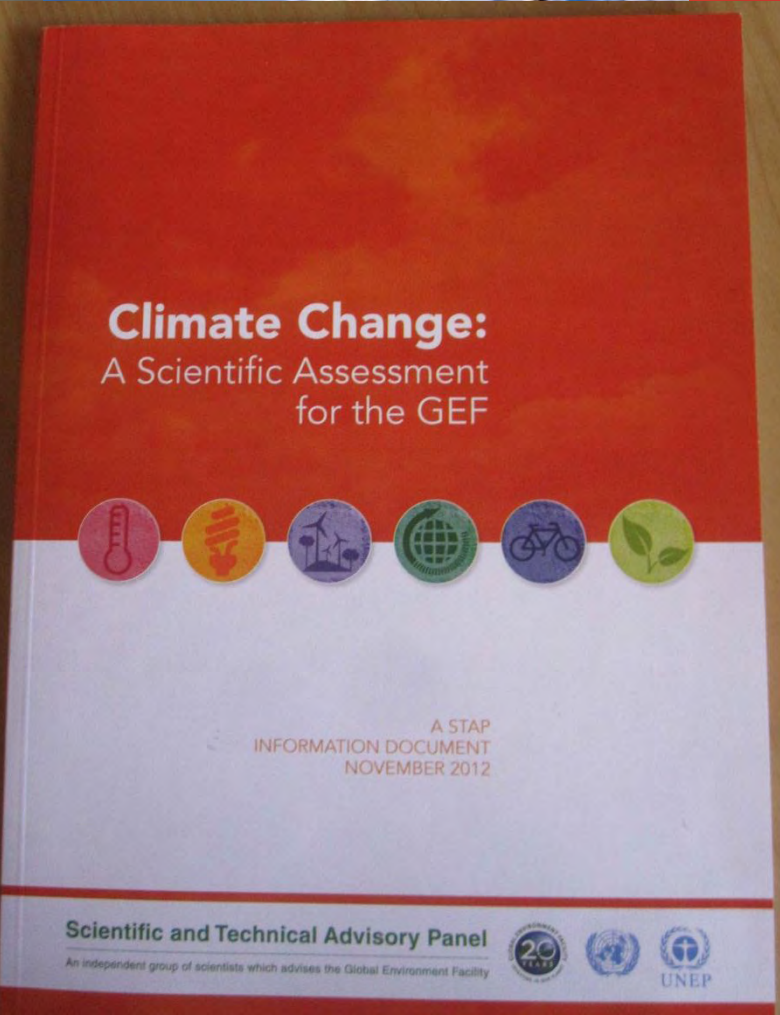
Aims

- Outline the current status on climate science knowledge as recently released by the IPCC;
- Present current world energy supply shares and future projections;
- Consider some solutions for reducing GHG emissions - with emphasis on co-benefits; and
- Recall that social sciences have a role to play since people are involved in the solutions.





RENEWABLES 2013
GLOBAL STATUS REPORT

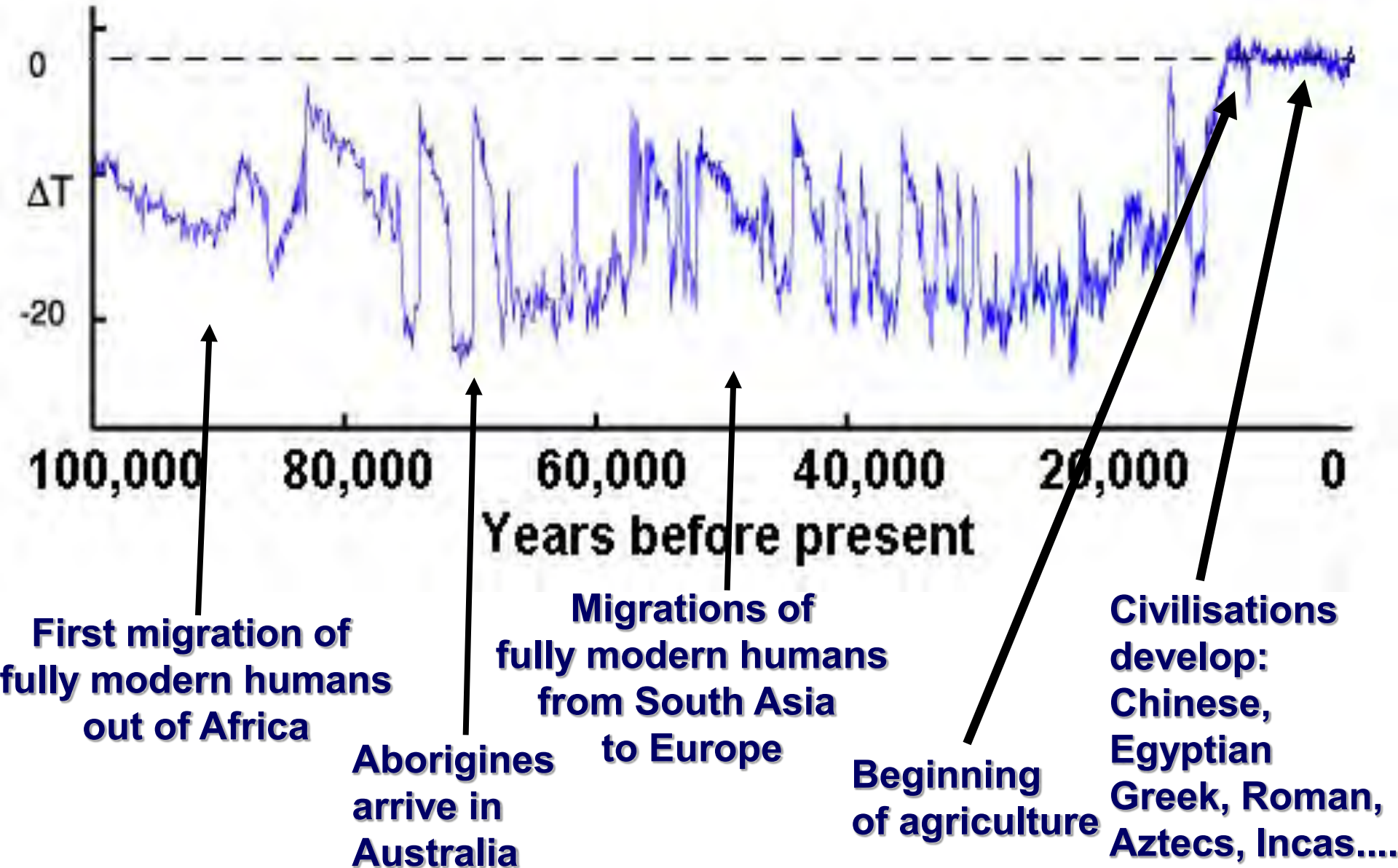


IPCC “Climate Science” report was released in September 2013

- The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years.**
- Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions.**
- The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide causing ocean acidification.**

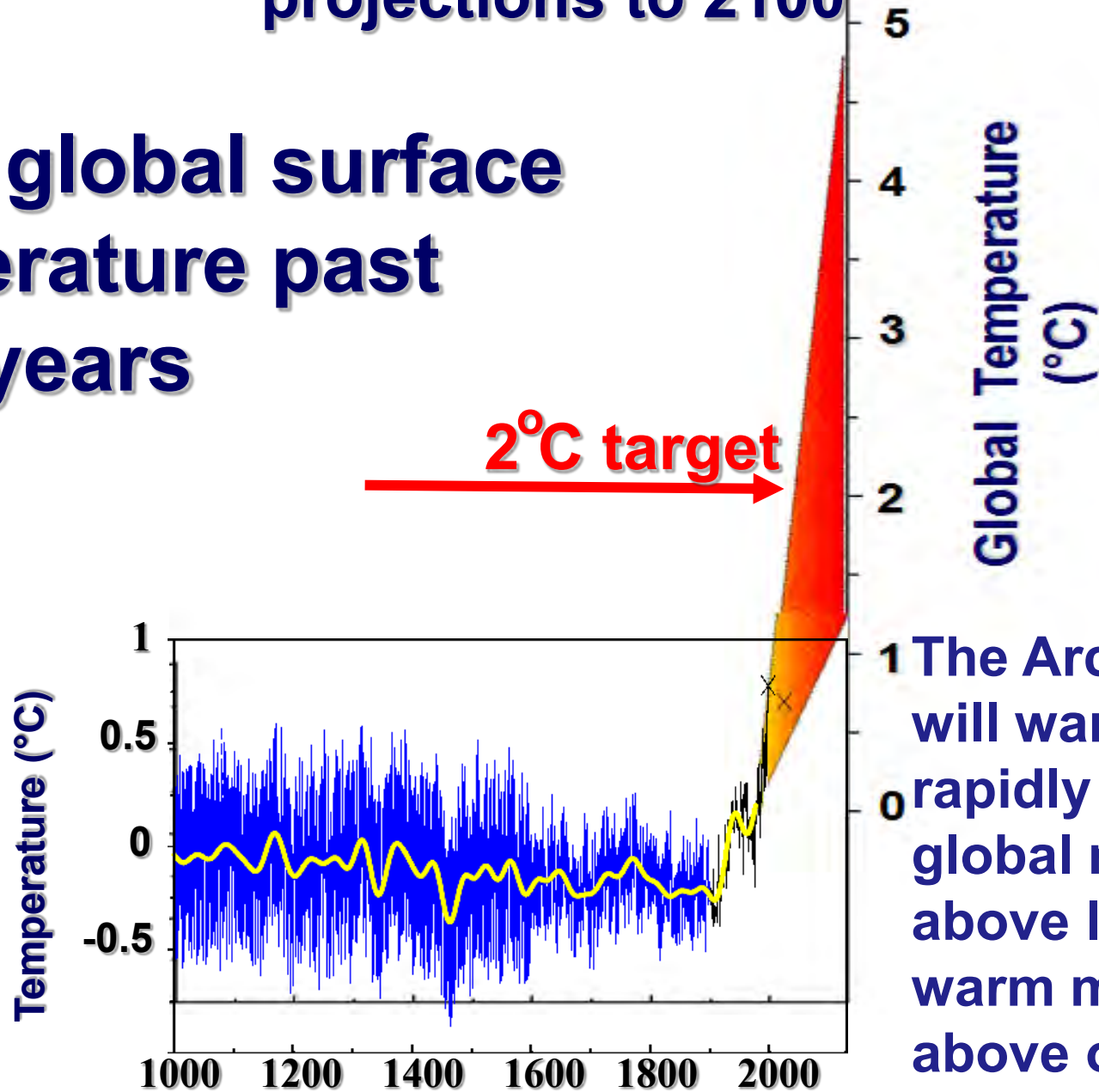
Details at <http://www.ipcc.ch/report/ar5/wg1/>

Last glacial-interglacial temperature cycle



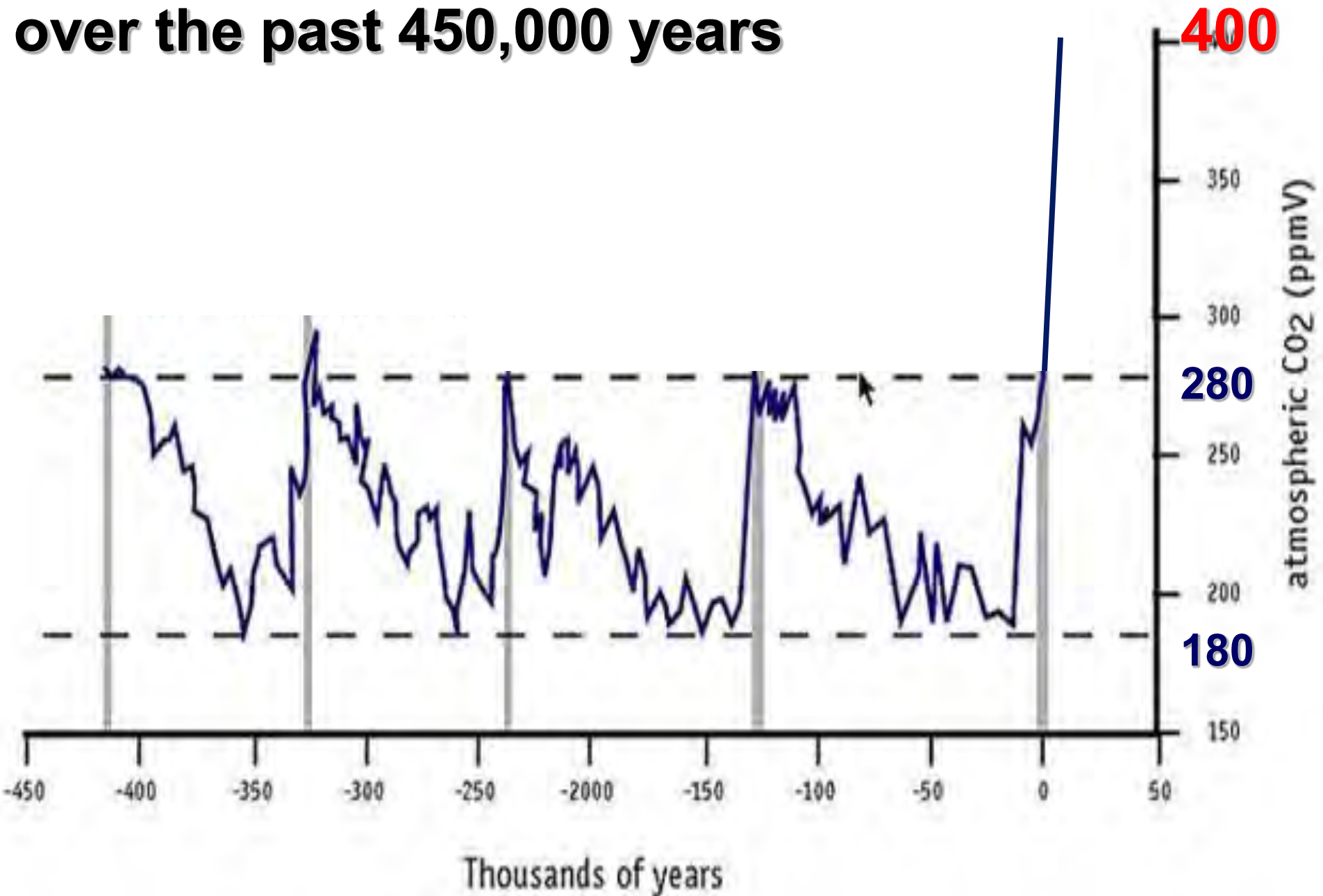
IPCC scenario projections to 2100

Mean global surface temperature past 1000 years



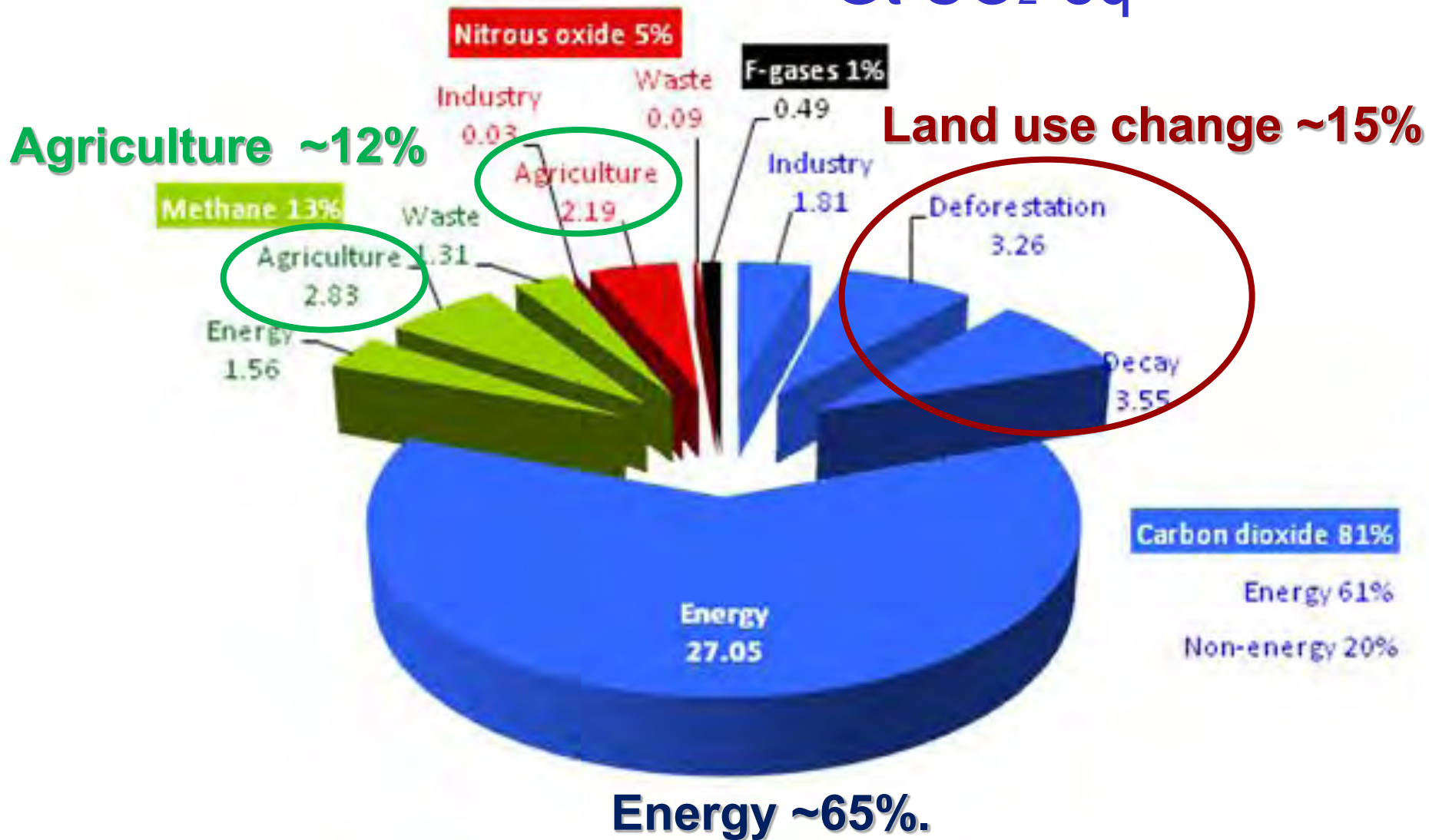
1 The Arctic region will warm more rapidly than the global mean, and above land will warm more than above oceans.

Atmospheric CO₂ concentrations over the past 450,000 years

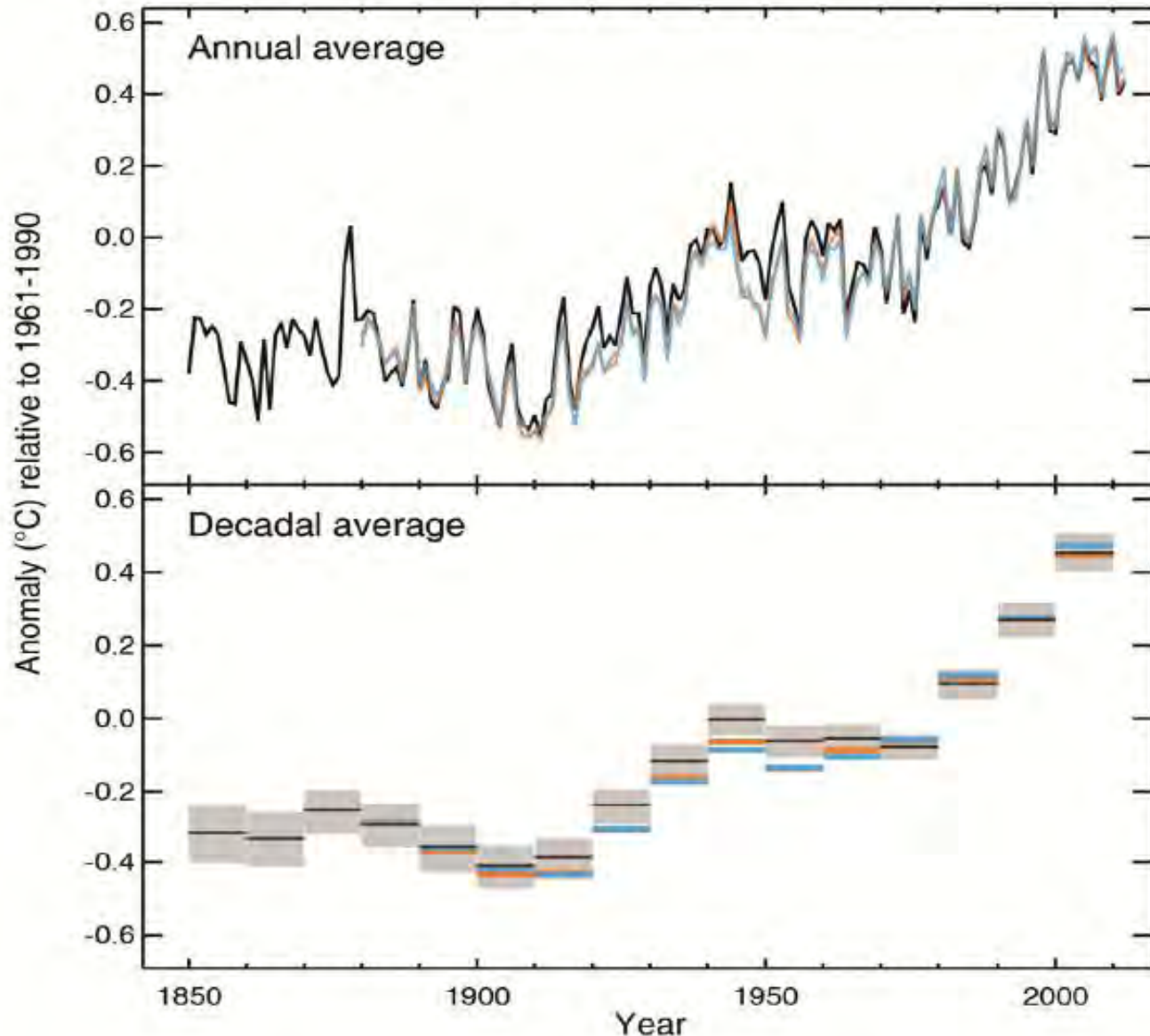


Annual global greenhouse gas emissions

Gt CO₂-eq

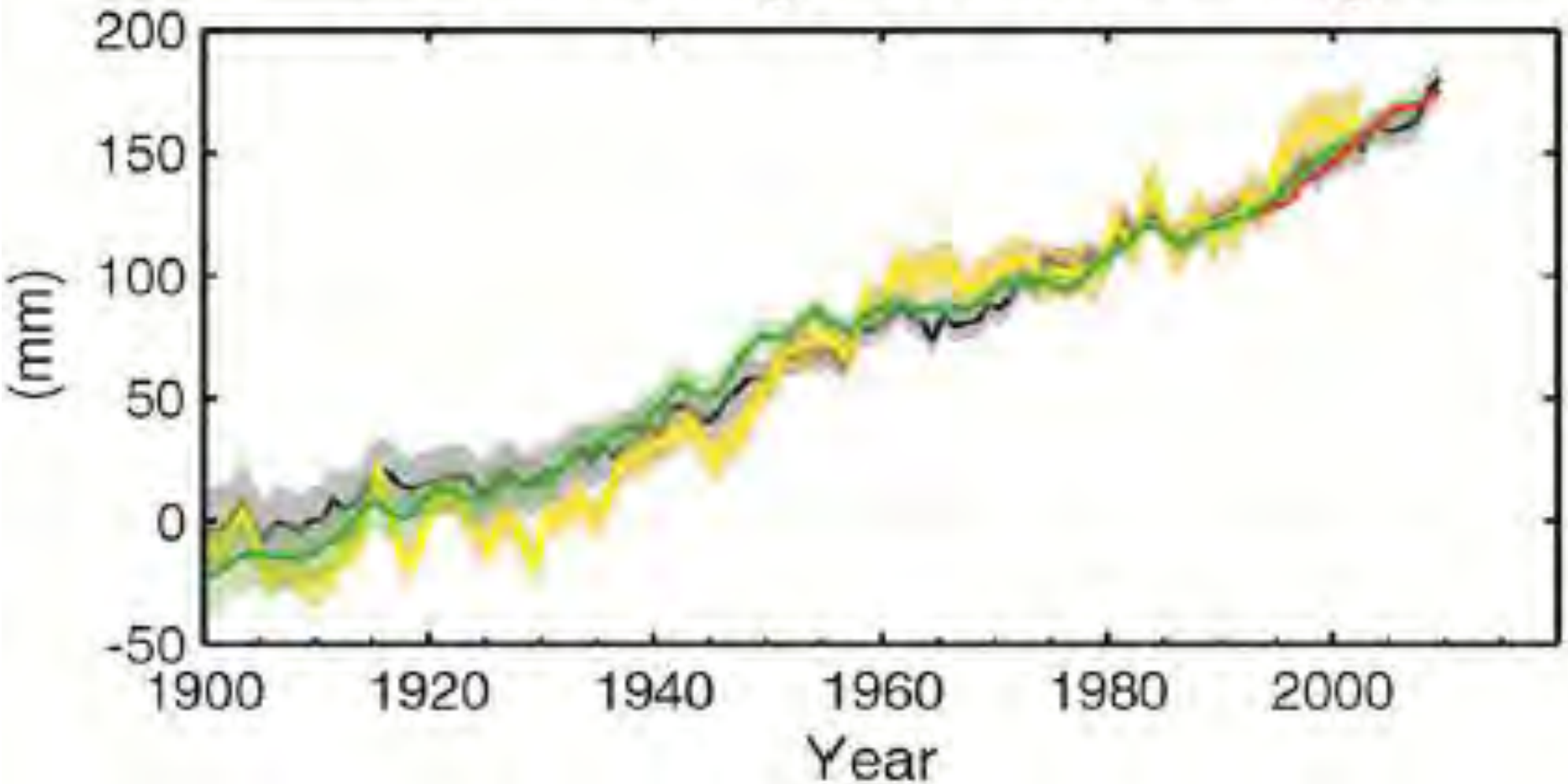


Each of the last three decades has been successively warmer at the Earth's surface (combined land and ocean) than any preceding decade since 1850.

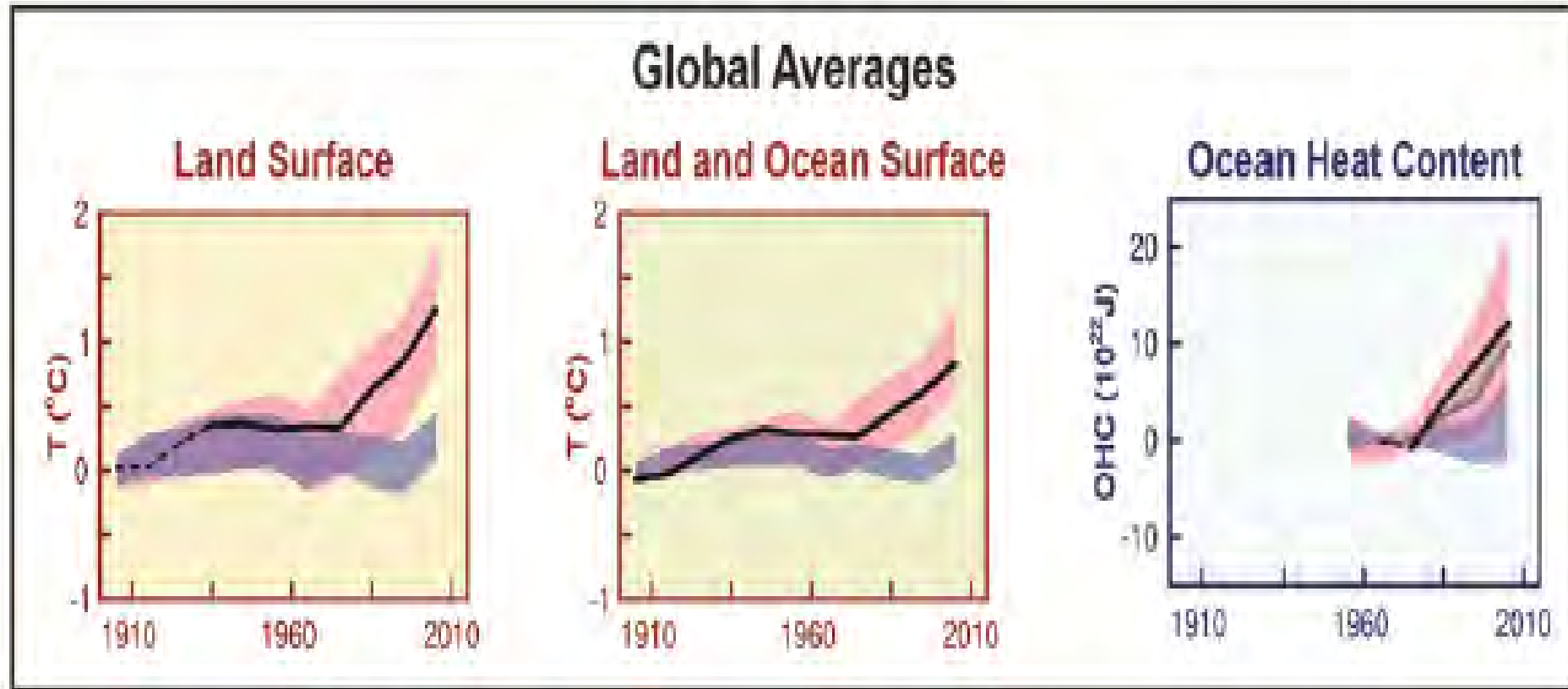


The rate of sea level rise last century has been larger than the mean rate during the previous two millennia

Global average sea level change



It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century.

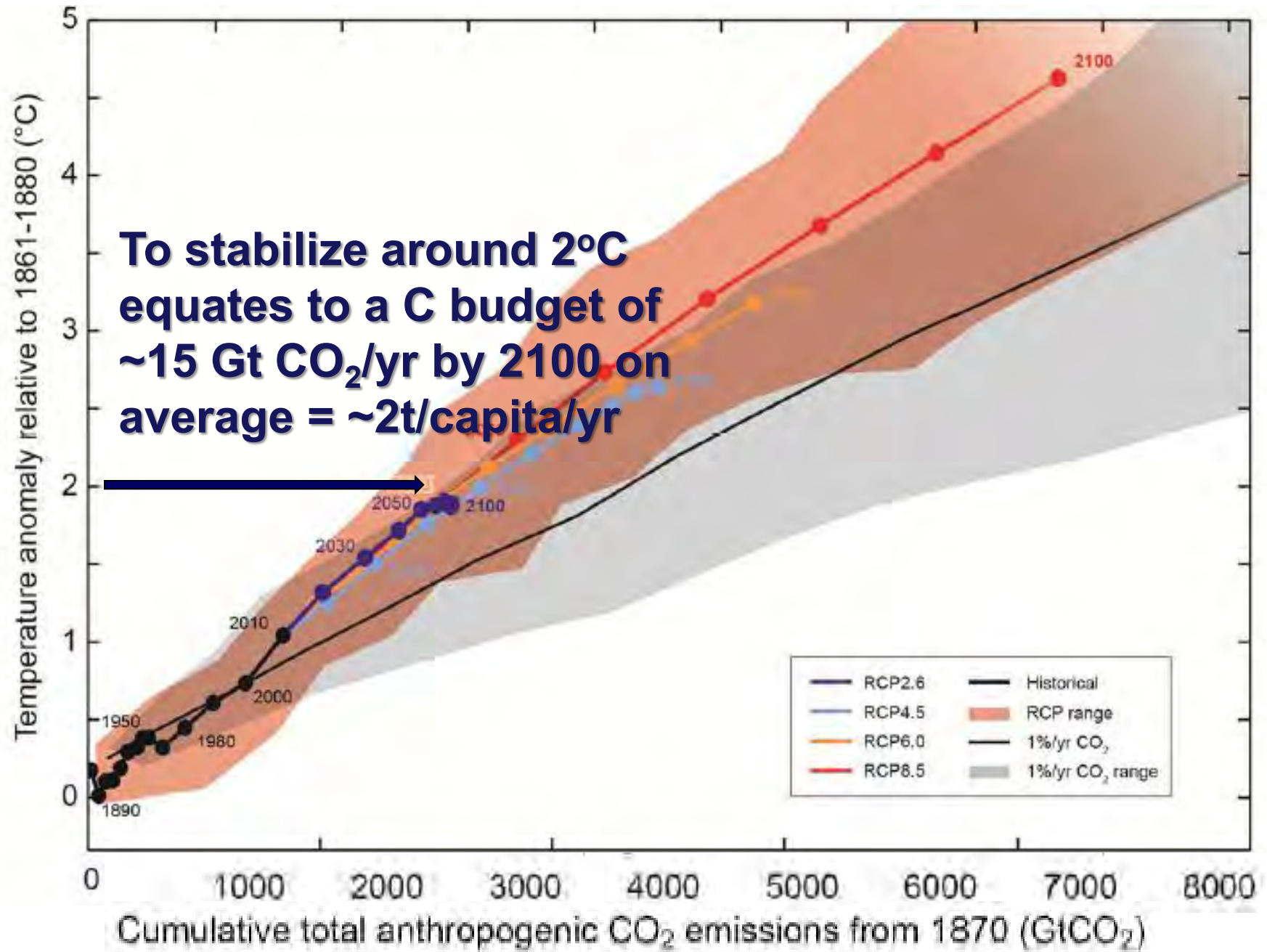


≡ Observations

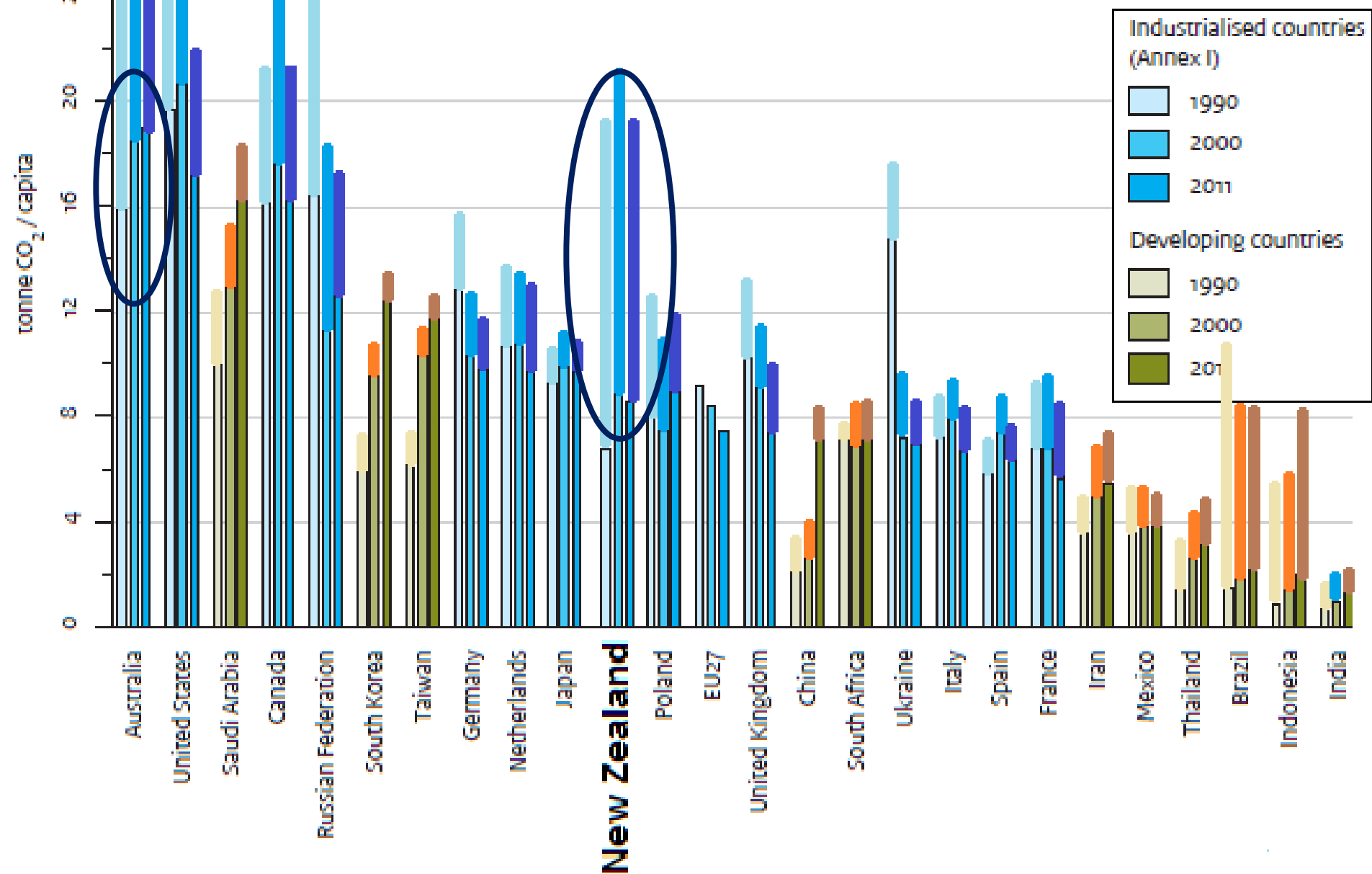
Models using only natural forcings

Models using both natural and anthropogenic forcings

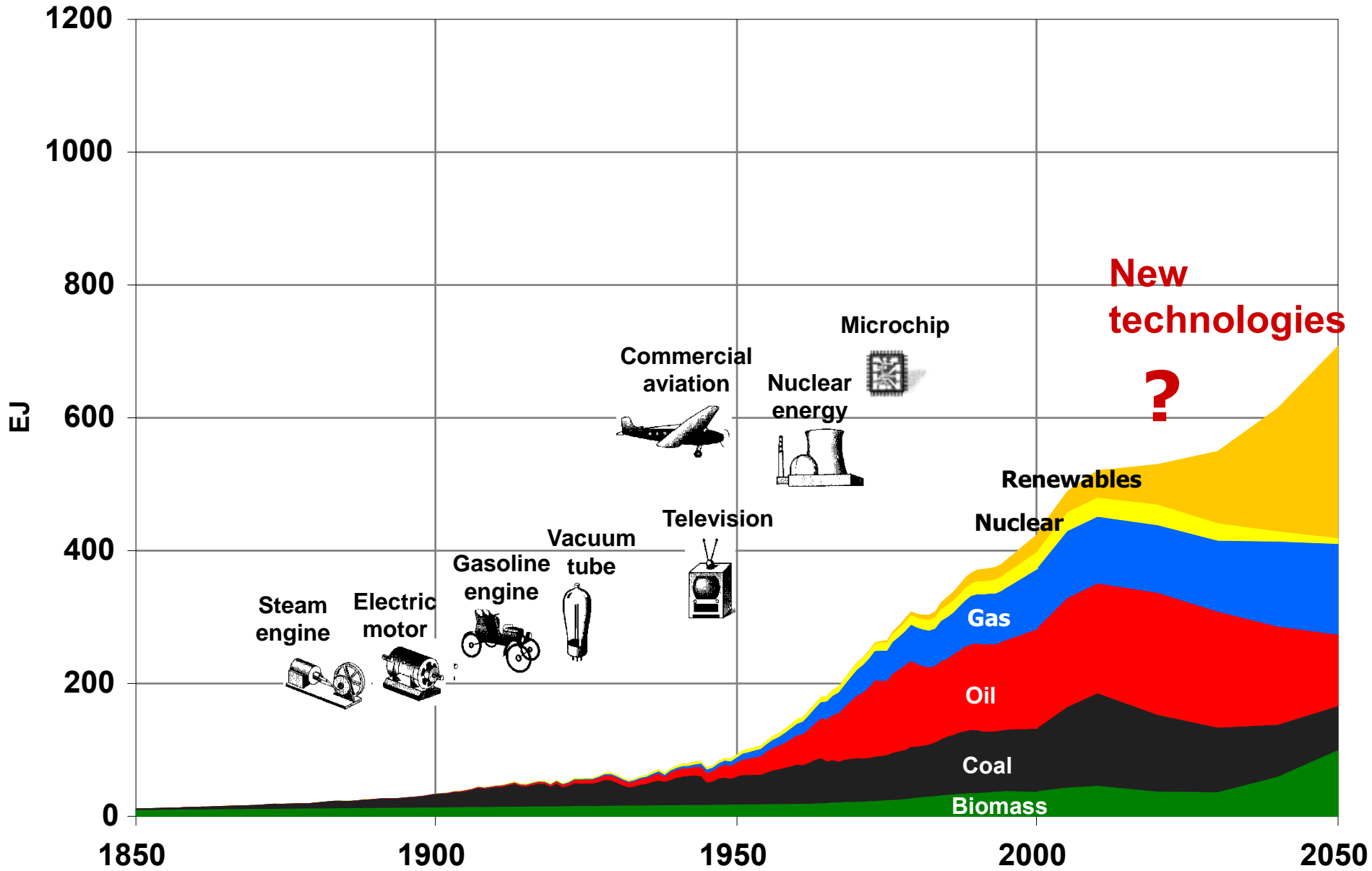
How much more Carbon can we release?



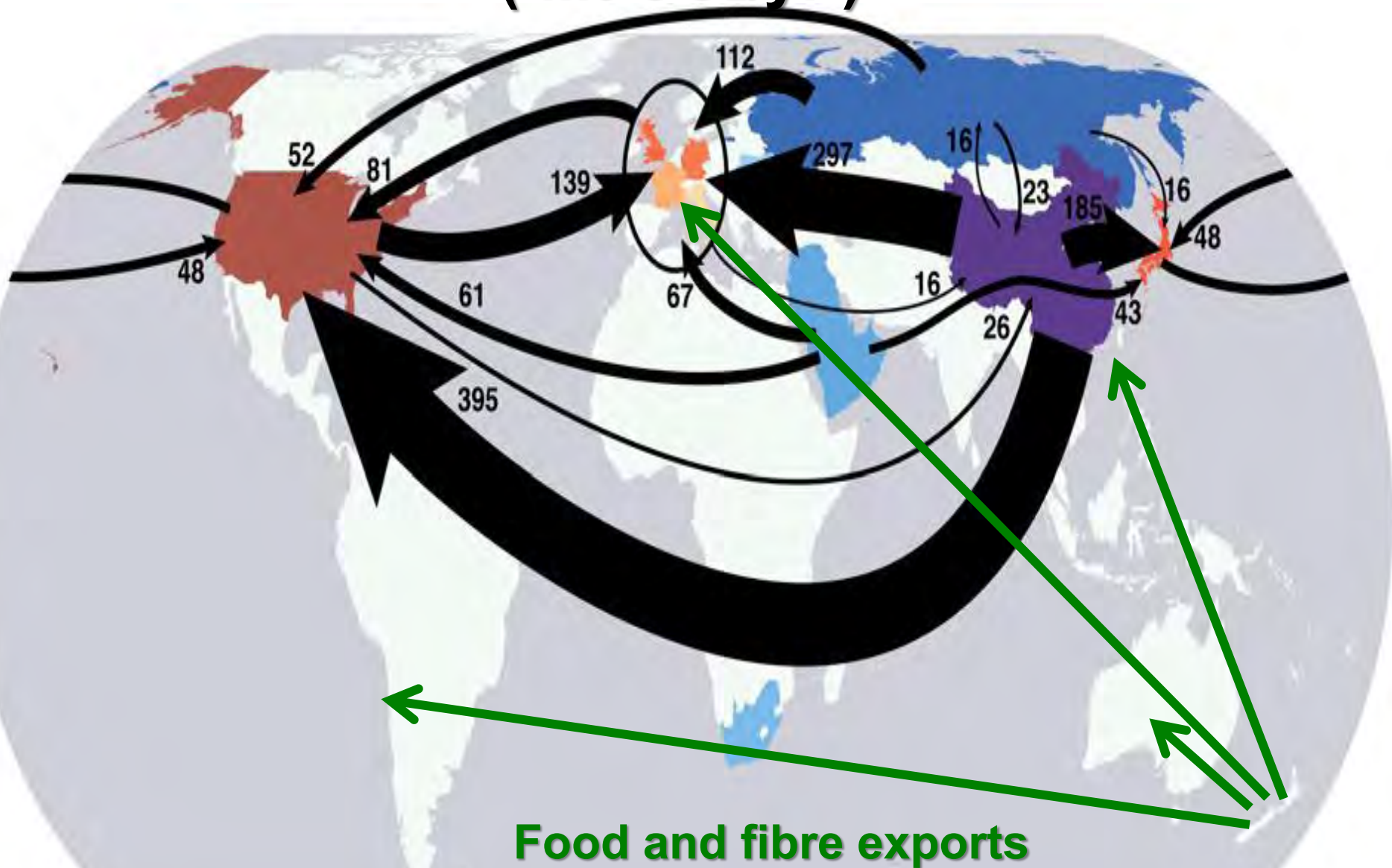
GHG / capita emissions



Global primary energy



Major emissions of GHG embodied in trade (Mt CO₂/yr)



Food and fibre exports