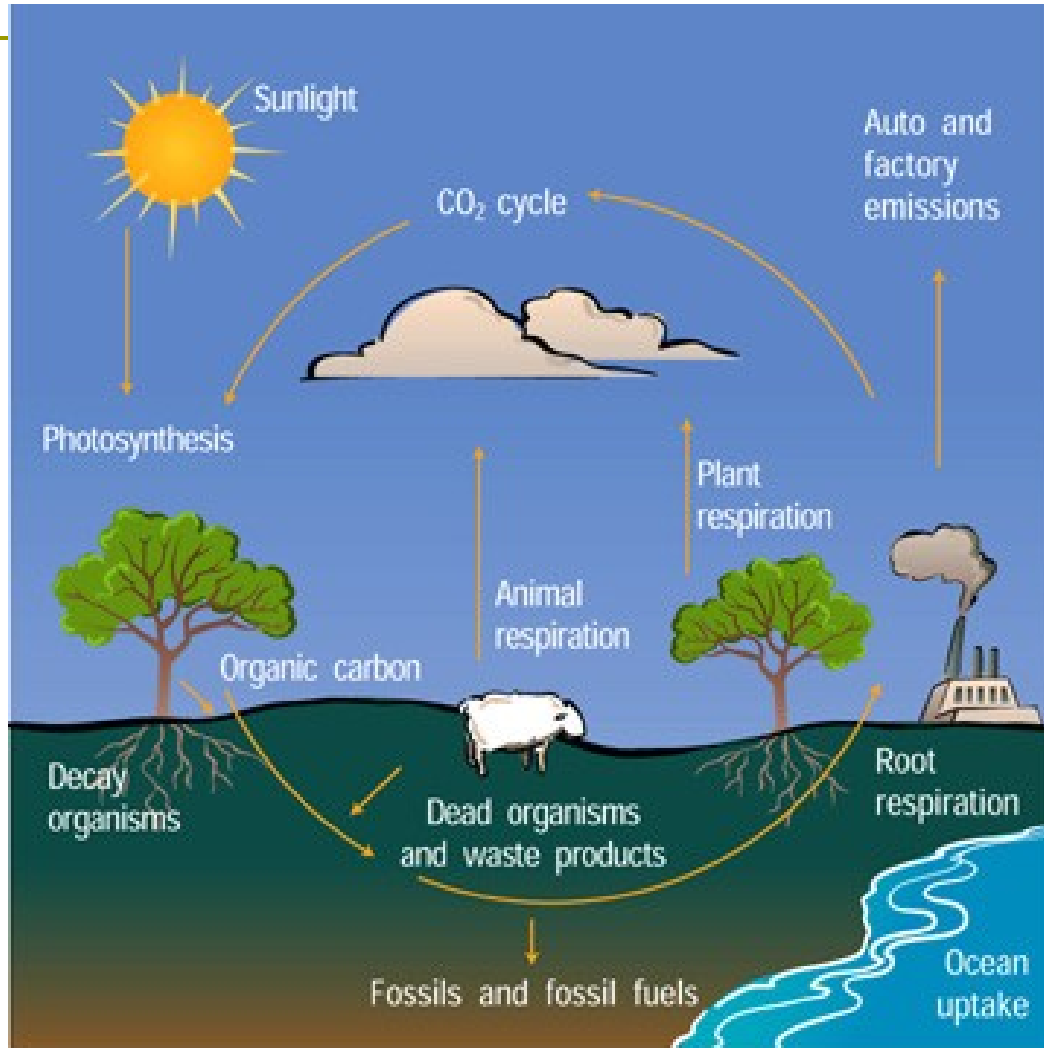

Based on presentations by John Houghton of IPCC, Earthguage, the Met. Office and the Stern Review

Preparation for tomorrow

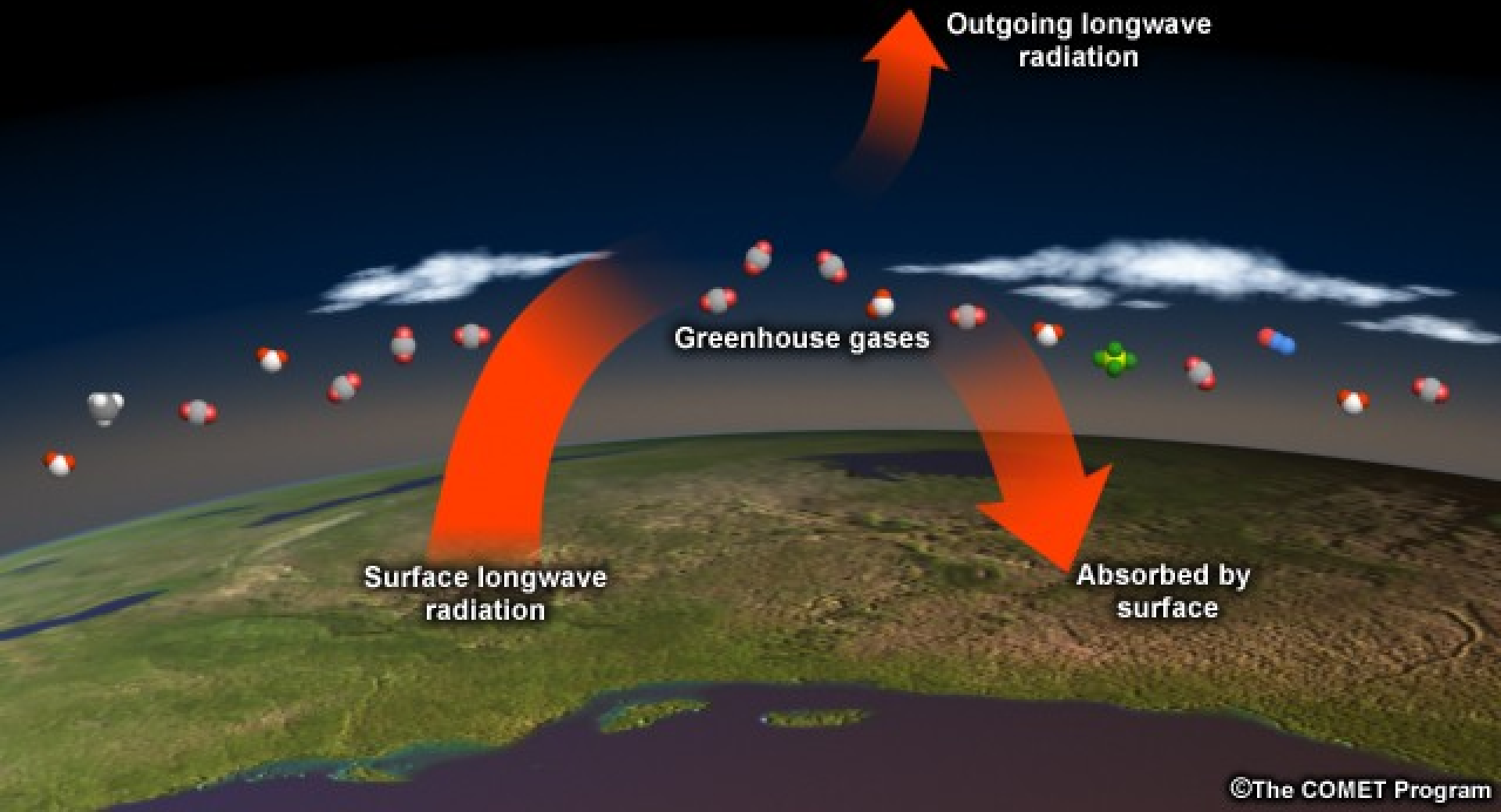
- Eagles: Cap and Trade
 - Sloths: carbon tax
 - Pandas: Cap and Share
 - Kauri Trees: tradable quotas
-
- Read the sheet
 - Think how it might affect a range of different people e.g. a pensioner, a global cement company, a local shop, a farm etc.



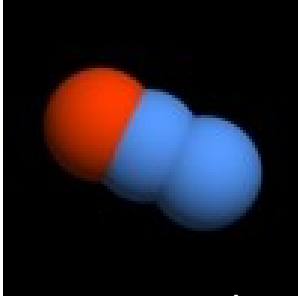
The Carbon Cycle



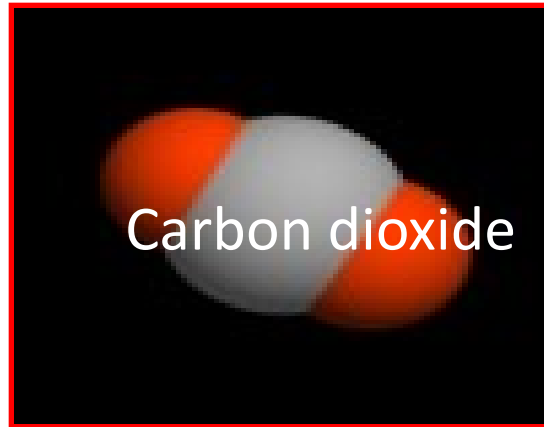
Increasing greenhouse gases trap more heat



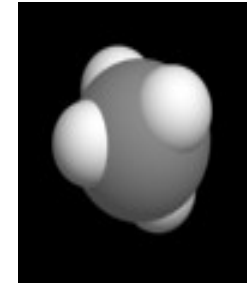
Greenhouse gases



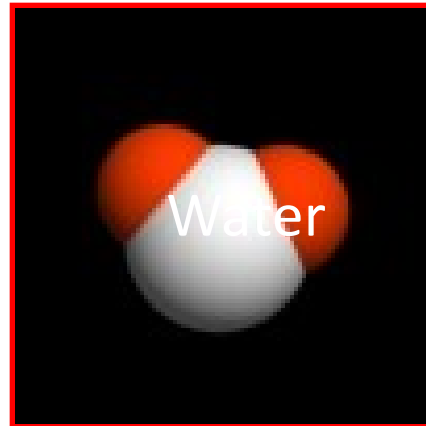
Nitrous oxides



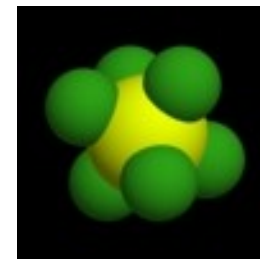
Carbon dioxide



Methane



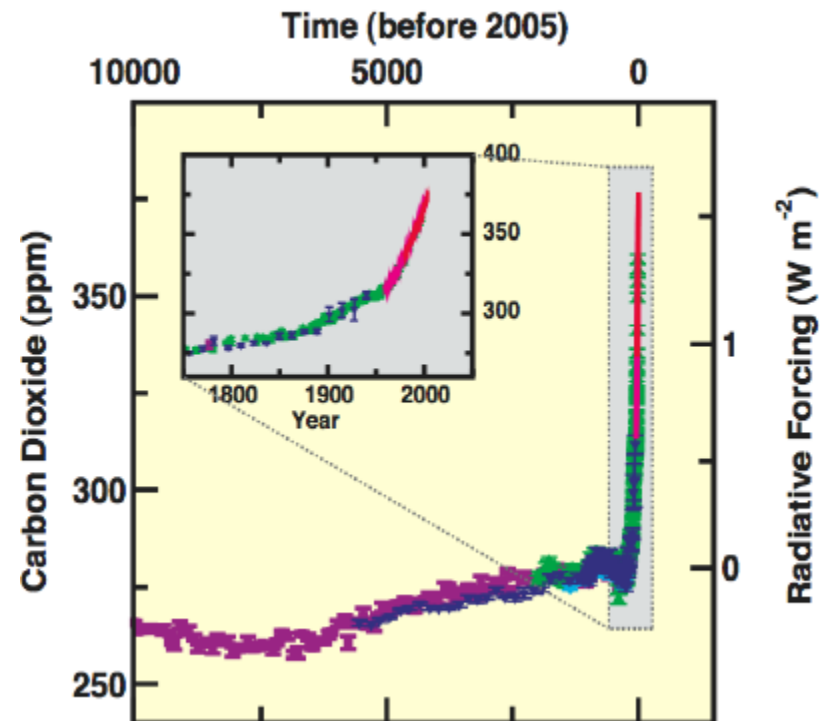
Water



Sulphur
hexafluoride

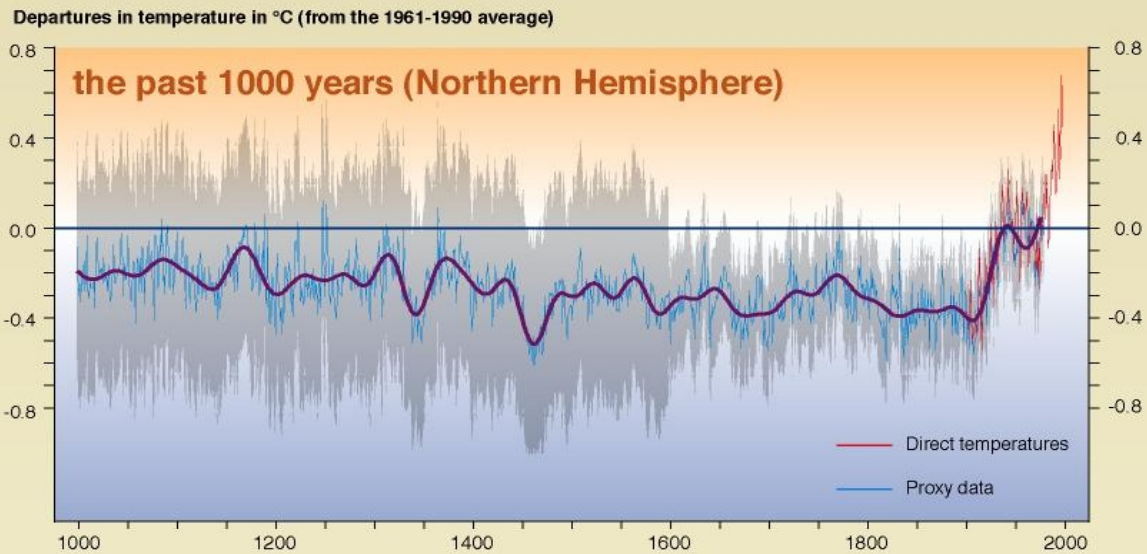
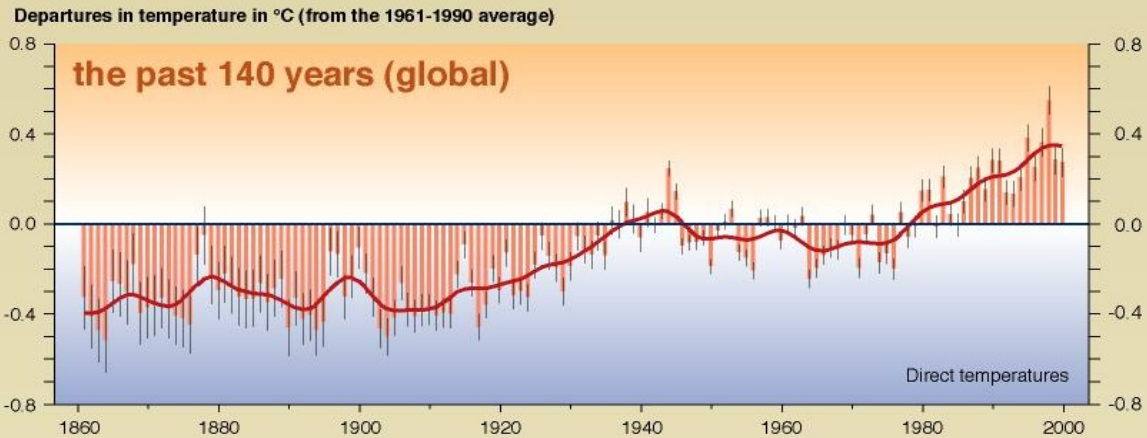
Unprecedented human drivers of climate change

- ❑ Carbon dioxide: a critical greenhouse gas
- ❑ Dramatic increase in industrial era, 'forcing' climate change
- ❑ Higher concentration than for more than 600,000 years



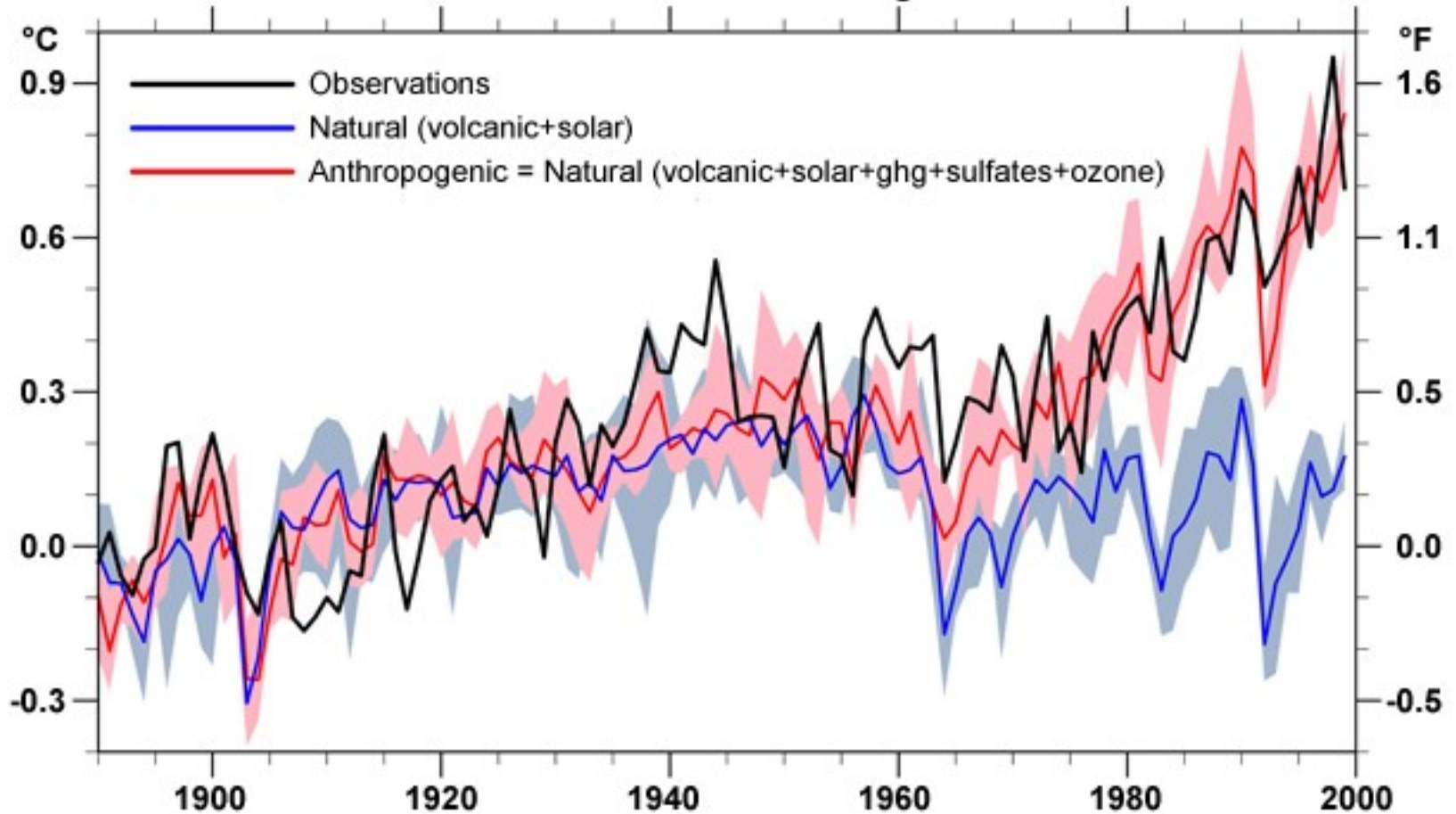
Global mean surface temperatures have increased

Variations of the Earth's surface temperature for...

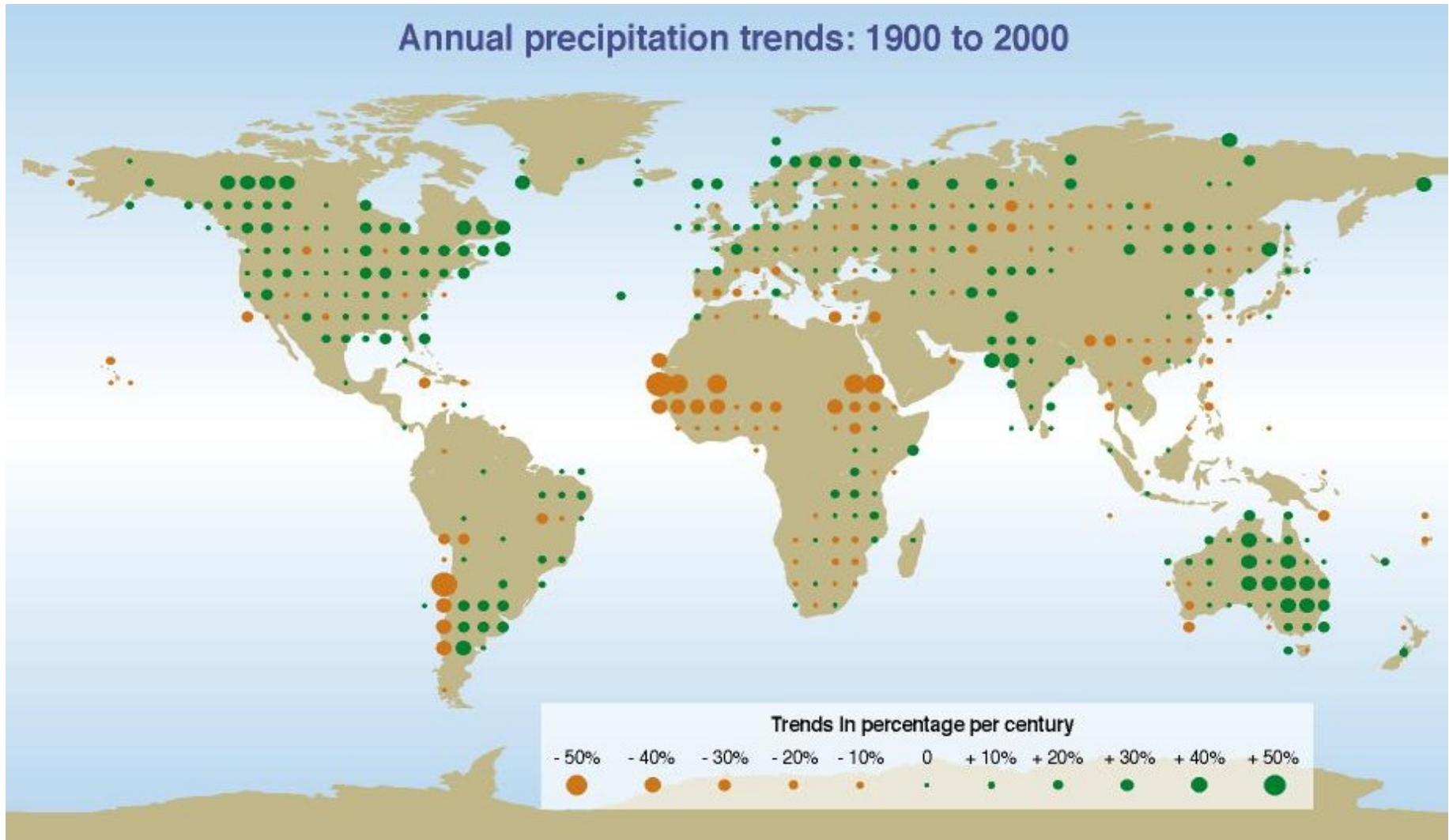


Climate Model Runs With/Without Greenhouse Gases

Global Temperature Anomalies
from 1890-1919 average



Precipitation patterns have changed



Consequences of sea-level rise

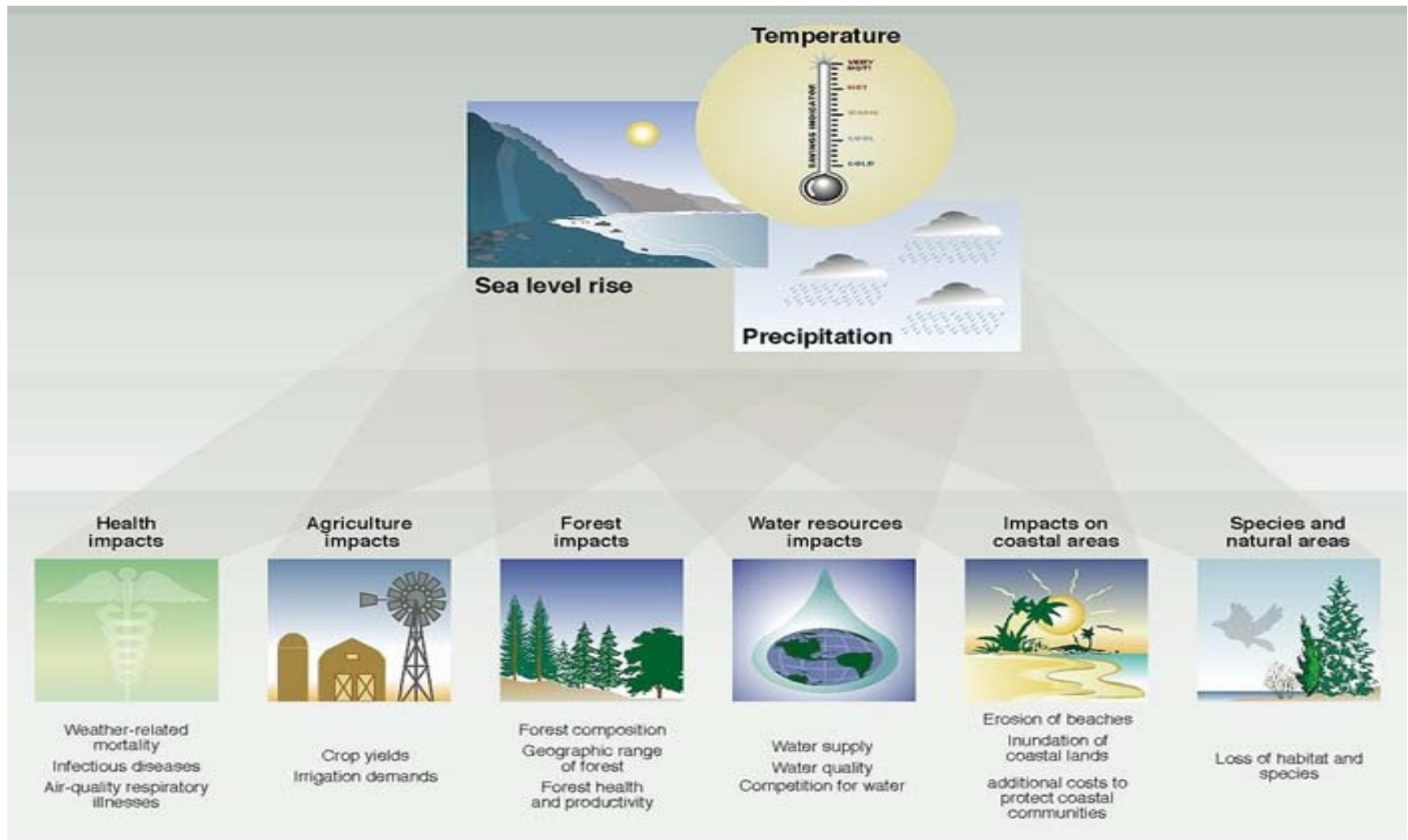
A rise of 5 metres would result in significant land loss

GOODBYE TO THE LOW COUNTRIES

A 5-metre sea-level rise would submerge large parts of north-west Europe



Impacts on biological and social systems

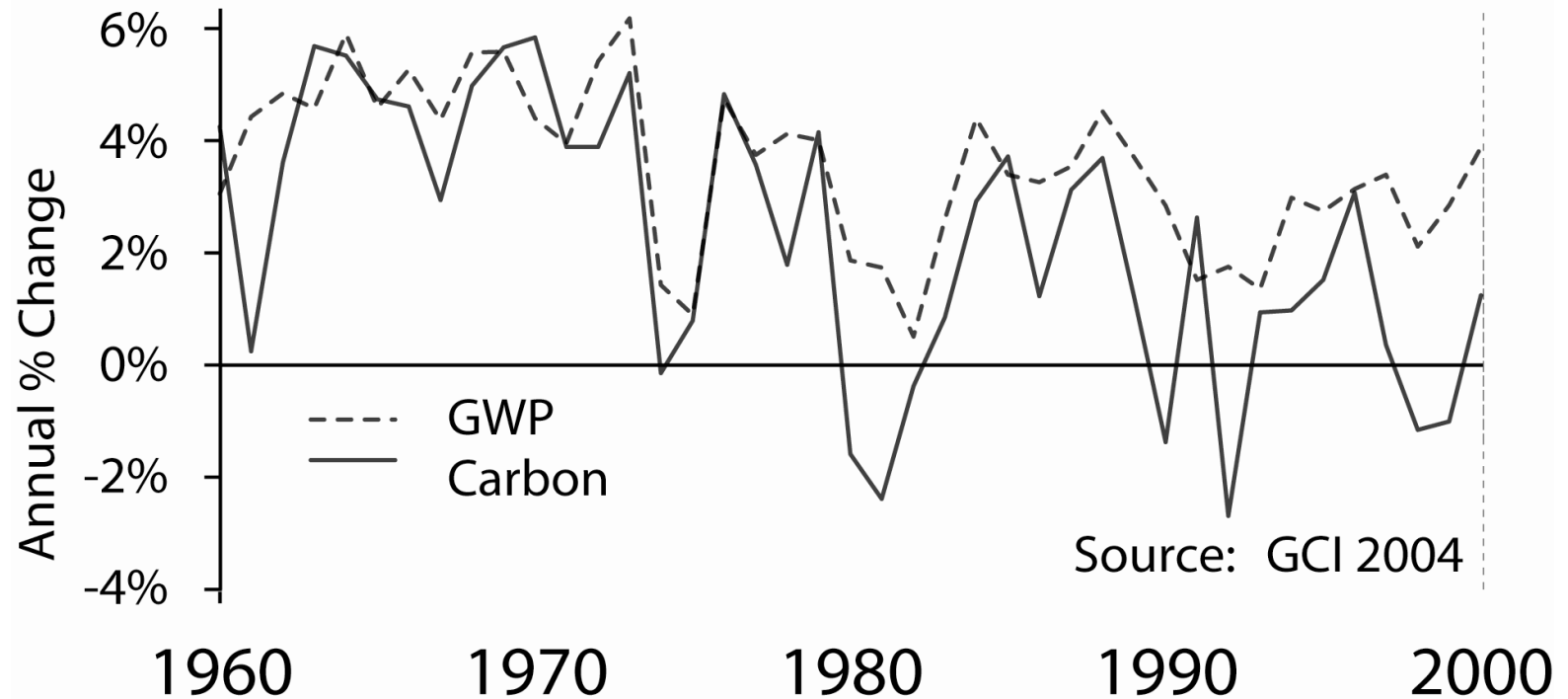


Time for thought . . .

- How much of this is about your personal behaviour and how much about how the economy is structured?
- How much is your responsibility and how much is the government's? Or is it the responsibility of business?
- What do you think? What does your neighbour think?

What does this have to do with business?

GWP, Carbon Lockstep

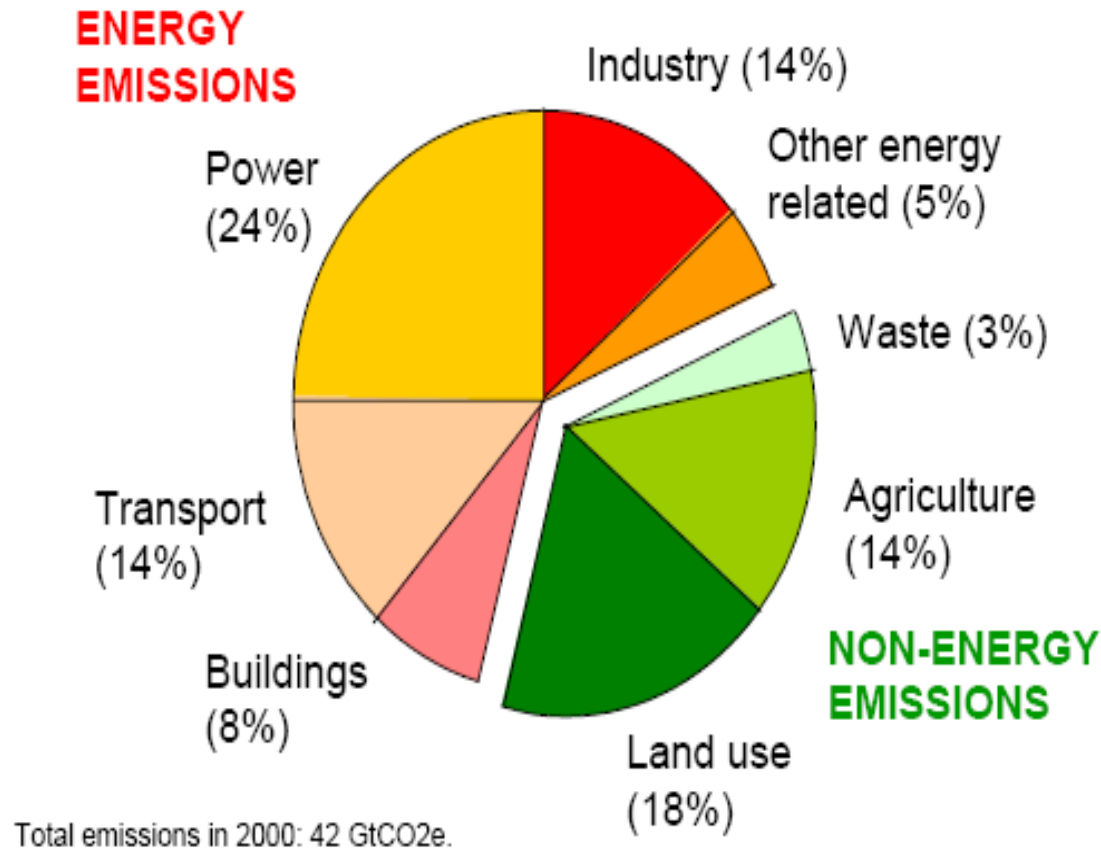


Stern Review

- The Stern Review was the first significant consideration by an economist of the environmental consequences of climate change
- Sir Nicholas Stern admitted he had only known about climate change for two years!



Greenhouse gas emissions in 2000 by source



Headlines

- ❑ What we do now can have only a limited effect on the climate over the next 40 or 50 years; what we do in the next 10 or 20 years can have a profound effect on the climate in the second half of this century and in the next.
- ❑ By investing 1% of GDP now (the next 10-20 years) we will avoid losing 20% of GDP later (40-50 years)
- ❑ Markets for low-carbon energy products are likely to be worth at least \$500bn per year by 2050, and perhaps much more. Individual companies and countries should position themselves to take advantage of these opportunities.

Main findings of the review

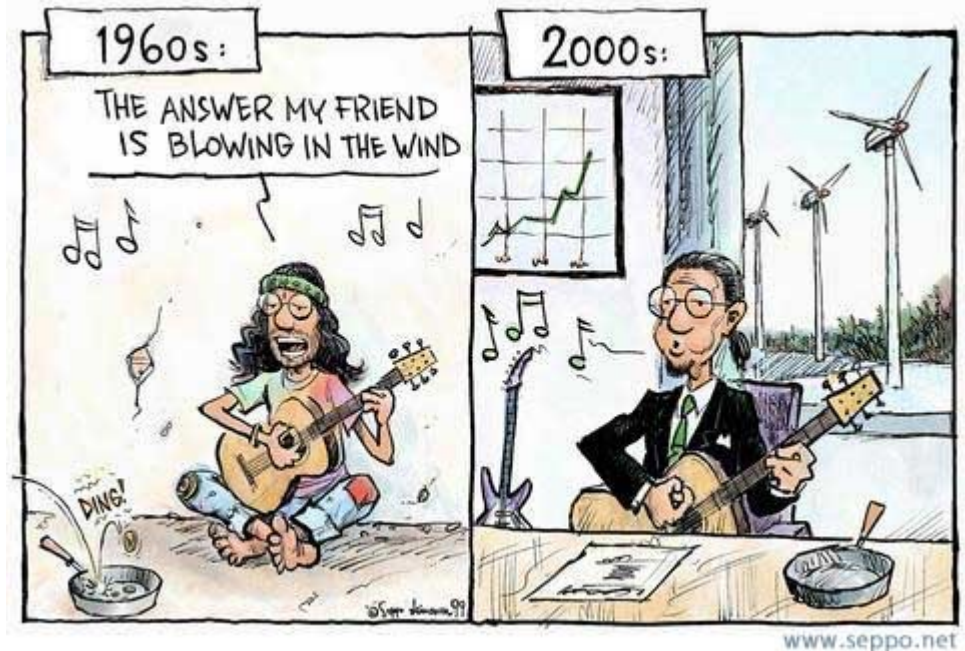
- ❑ CO2 emissions are caused by economic growth but policy to tackle climate change is not incompatible with economic growth;
- ❑ Favours the transition to a 'low carbon economy' which will 'bring challenges to competitiveness but also opportunities for growth';
- ❑ Policy to reduce emissions should be based on three essential elements:
 - carbon pricing
 - technology policy and subsidies for renewable sectors
 - removal of barriers to behavioural change

Country comparisons of emissions, 2009

Country	MTCO ₂ per capita	Rank	Total MTCO ₂	Rank
Luxembourg	27.9	1	12.7	36
Australia	25.8	2	525.4	10
USA	24.4	3	7,241.5	1
Russian Federation	14.9	8	2,132.5	3
Czech Republic	14.2	9	145.6	16
Germany	12.1	15	1,001.5	5
United Kingdom	10.9	19	657.4	7
Japan	10.6	21	1,359.9	4

Problems for policy-makers

- ❑ *Uncertainty*
- ❑ *Credibility*: Tax take?
- ❑ *Impracticality*: labour-intensive and thus costly on the public purse
- ❑ *Impersonality*: what is our personal incentive?



Upstream or Downstream?

- Upstream – with producers – is simpler, e.g. when the fossil fuel comes out of the ground
- How can we be sure this will be passed on to consumers?
- Downstream is complex and costly
- But downstream – i.e. with consumers – does impose individuality responsibility
- Downstream is also educational

Putting a price on carbon

- ❑ Applying a price to emissions of greenhouse gases (GHGs), not just carbon dioxide (CO₂ does make up 80% of GHGs)
- ❑ Both carbon tax and cap-and-trade system are examples of carbon pricing
- ❑ Polluter pays principle: stop treating the atmosphere as a free dumping ground
- ❑ Including this cost gives an incentive for polluters to invest in using less energy and using cleaner energy (EE and RE): especially strong for heavy industry

Market-based policies: carbon offsetting

- ❑ You have a high-carbon lifestyle
- ❑ You pay somebody with a low-carbon lifestyle to compensate for your emissions
- ❑ Clean Development Mechanism allowed countries to do this
- ❑ Carbon offsetting companies allow you to do this for flights
- ❑ How do you cost the global atmosphere?
 - London to Sydney return flight = 3.56T
 - = £35.60 = Kč 1,000

Cheat neutral

