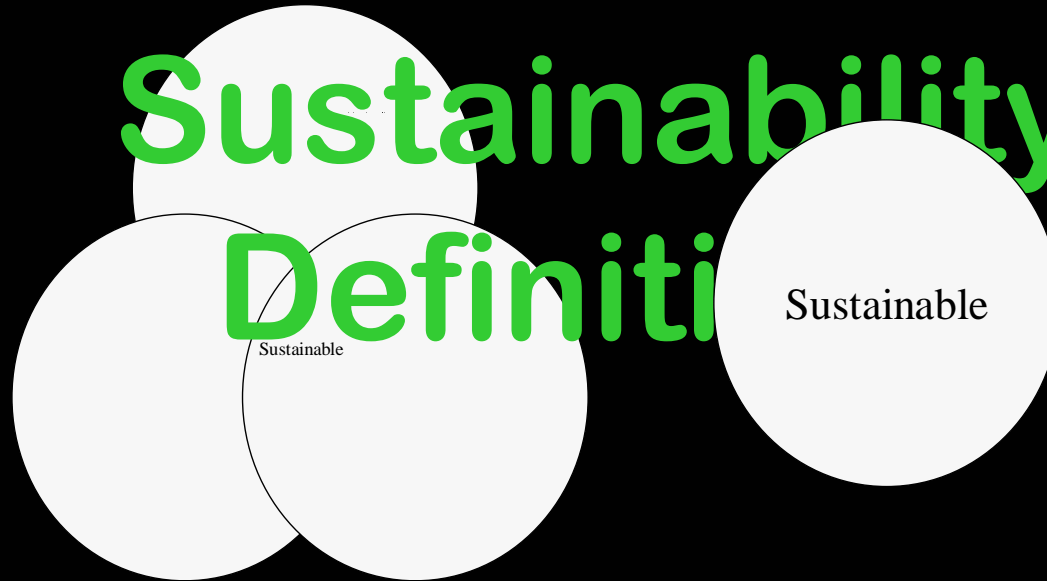








# Sustainability Definition



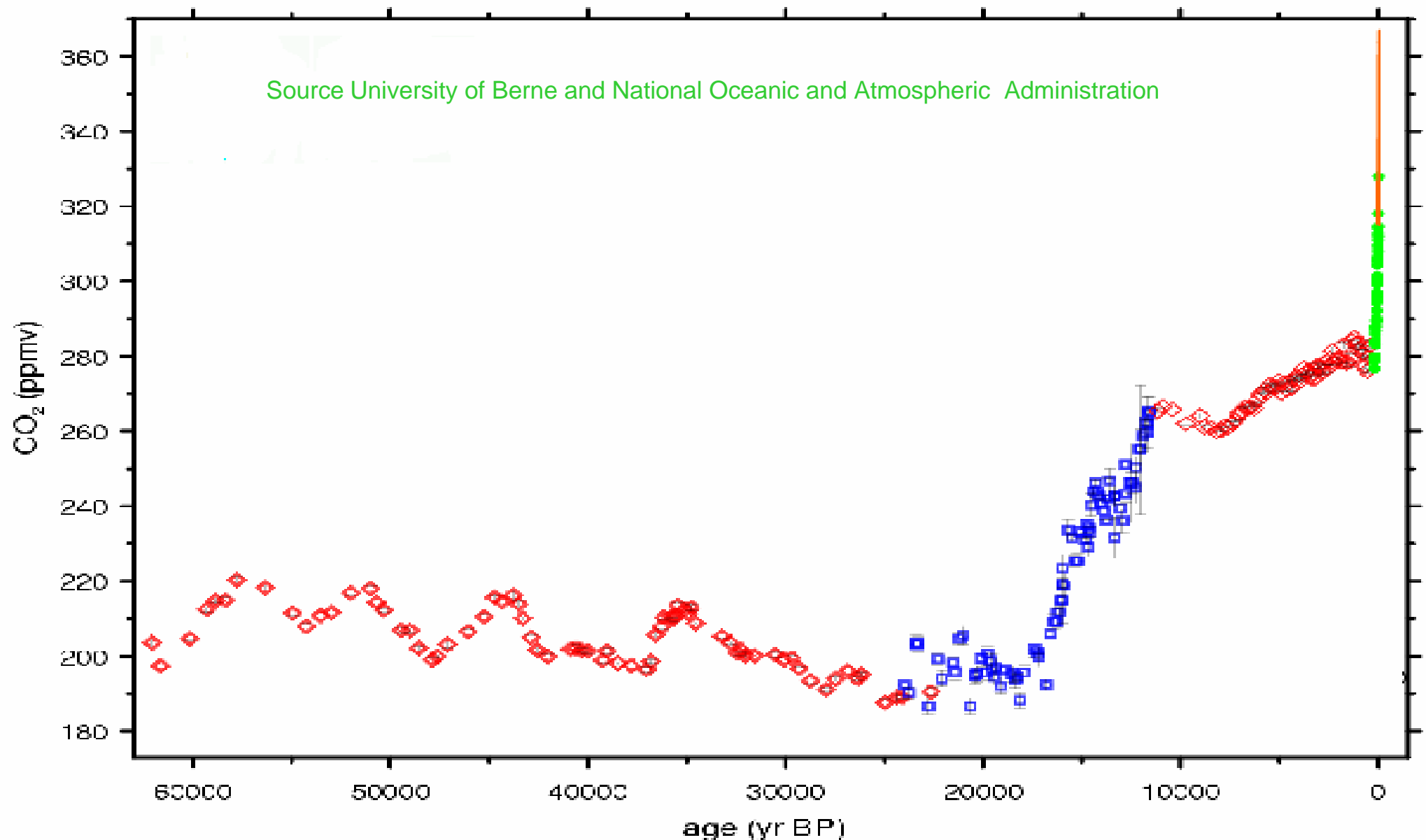
# Global Imperative

- Imperative
- No more BAU Business As Usual
- Principles of green specification

# Energy and climate change

- Climate change is the biggest problem facing humanity today
- We need to be aware of how we produce and use energy
- And the consequence of our current habits
- We must adapt & we need to mitigate
- Any Sceptics in the room?

# CO<sub>2</sub> levels over 60,000 years





# Consequences of no action

# Extreme weather events

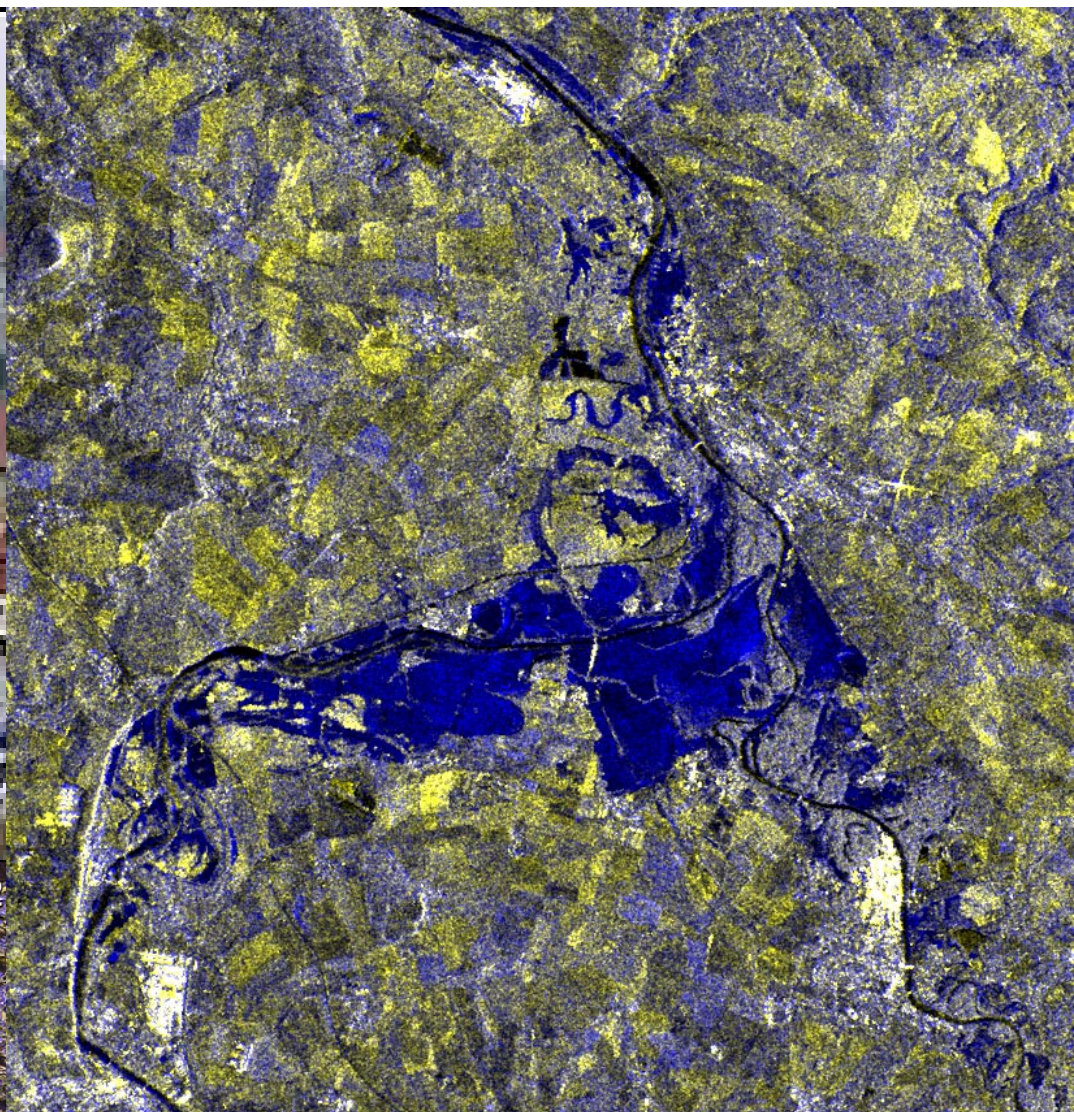
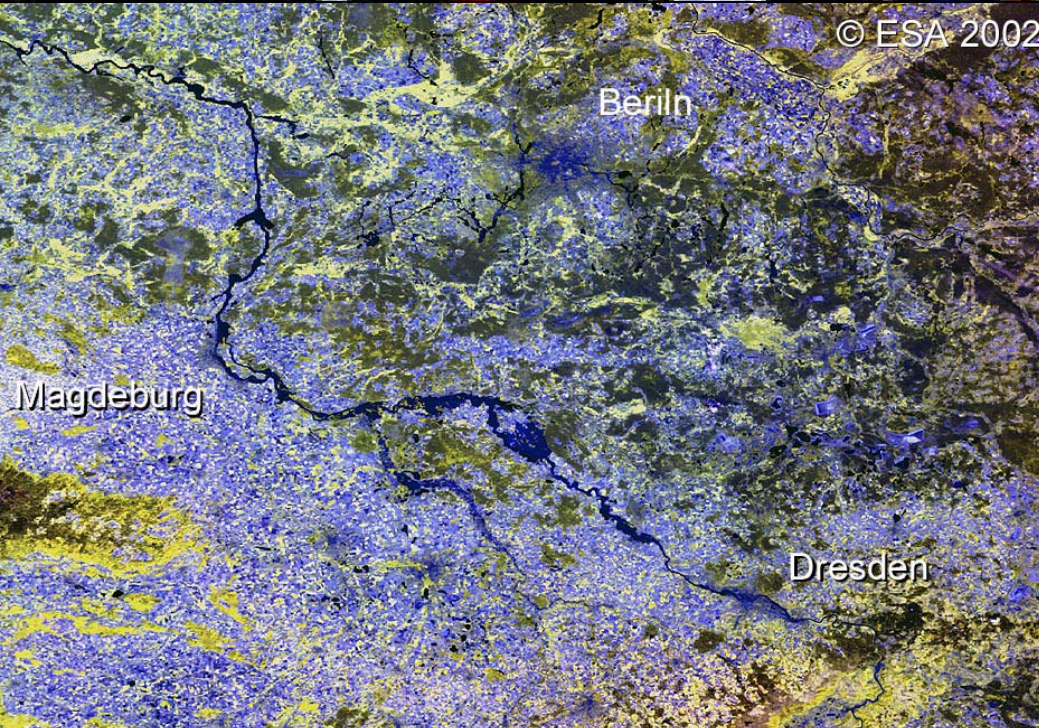
- UK floods, autumn 2000
  - Insurance pay-out £1bn



# Extreme weather events

- European floods 2002
  - 37 deaths
  - \$16bn direct costs

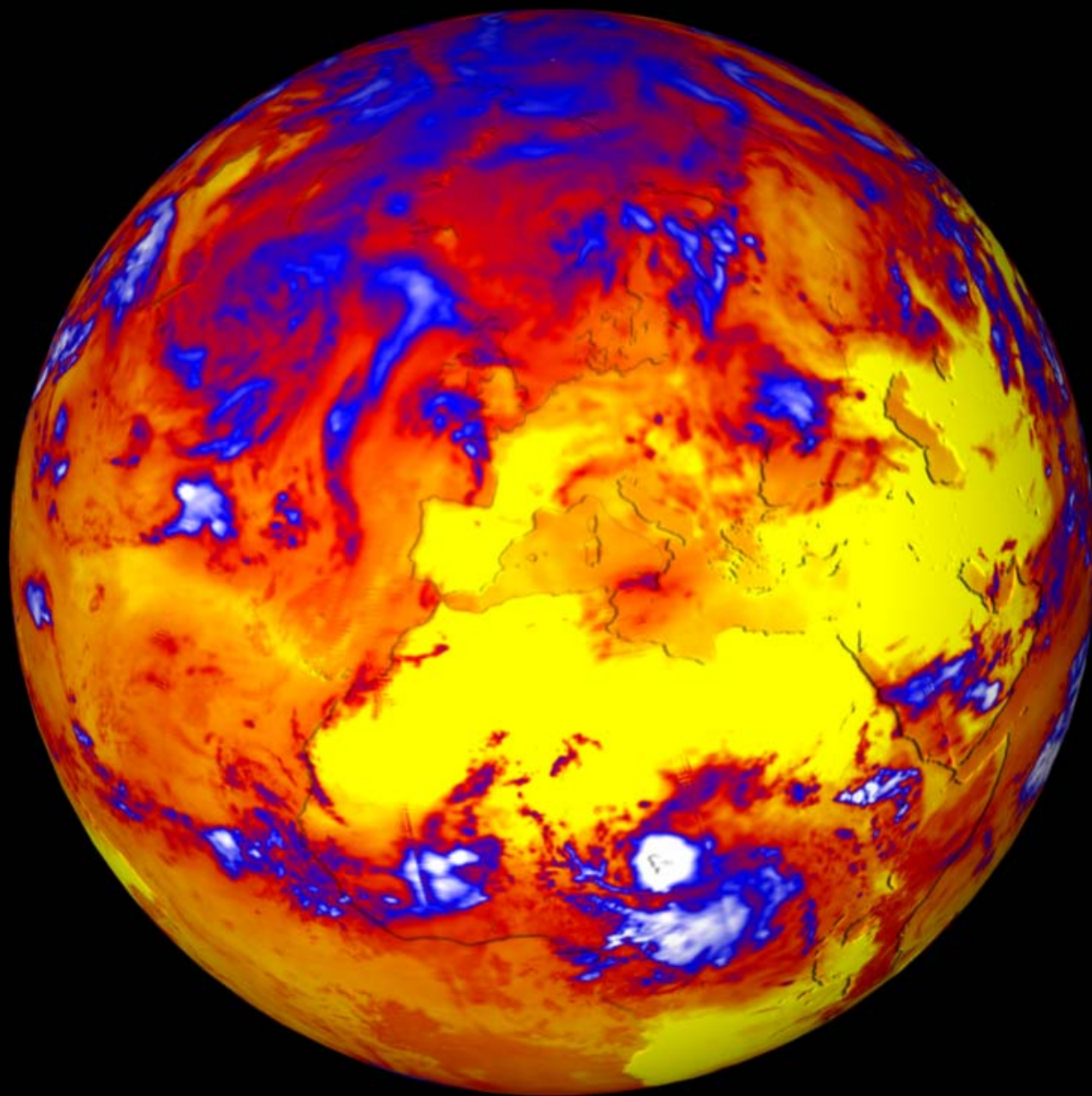
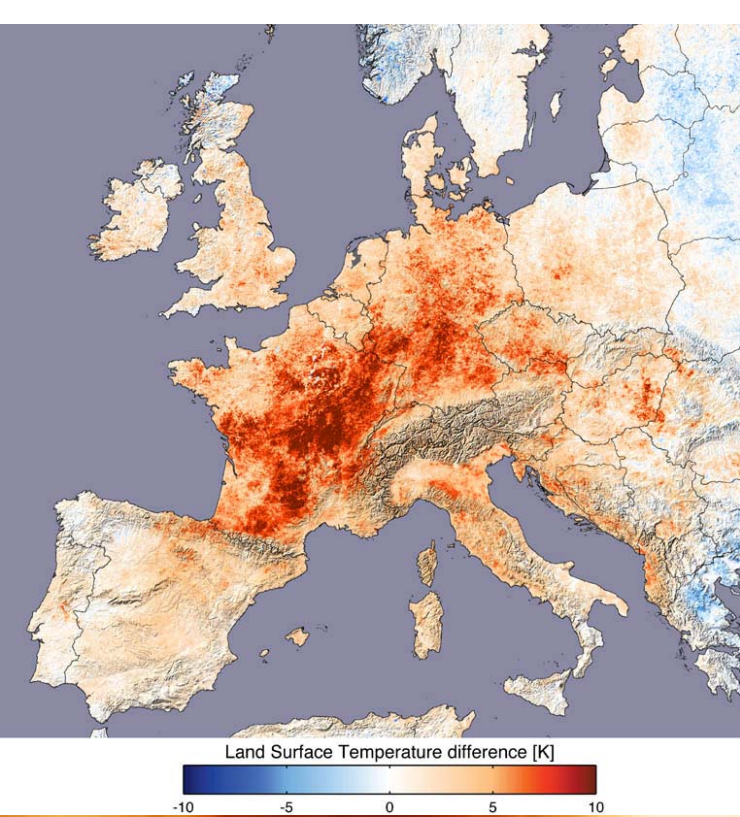






# Extreme weather events

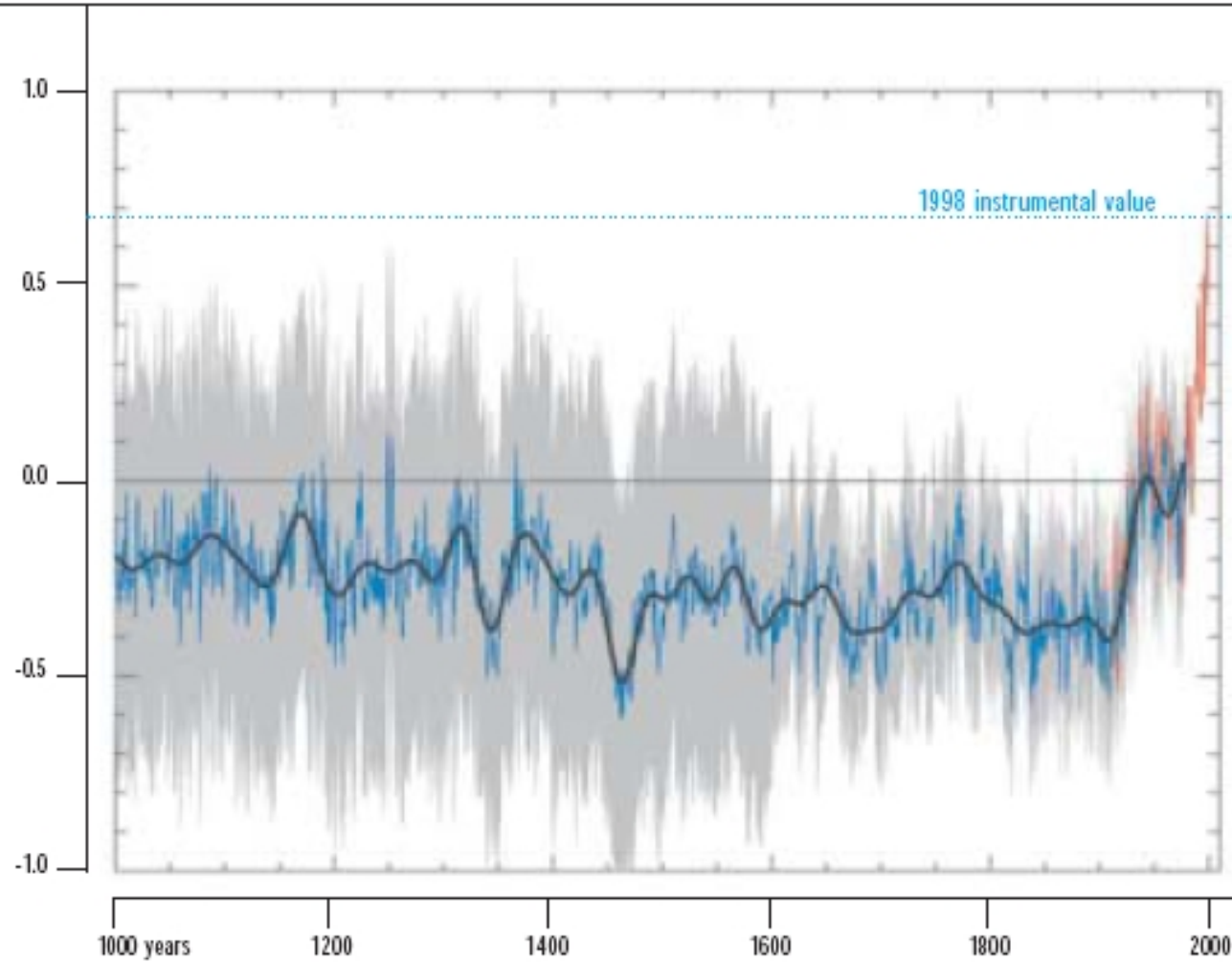
- European heat-wave 2003
  - 30,000 deaths
  - \$13.5bn direct costs



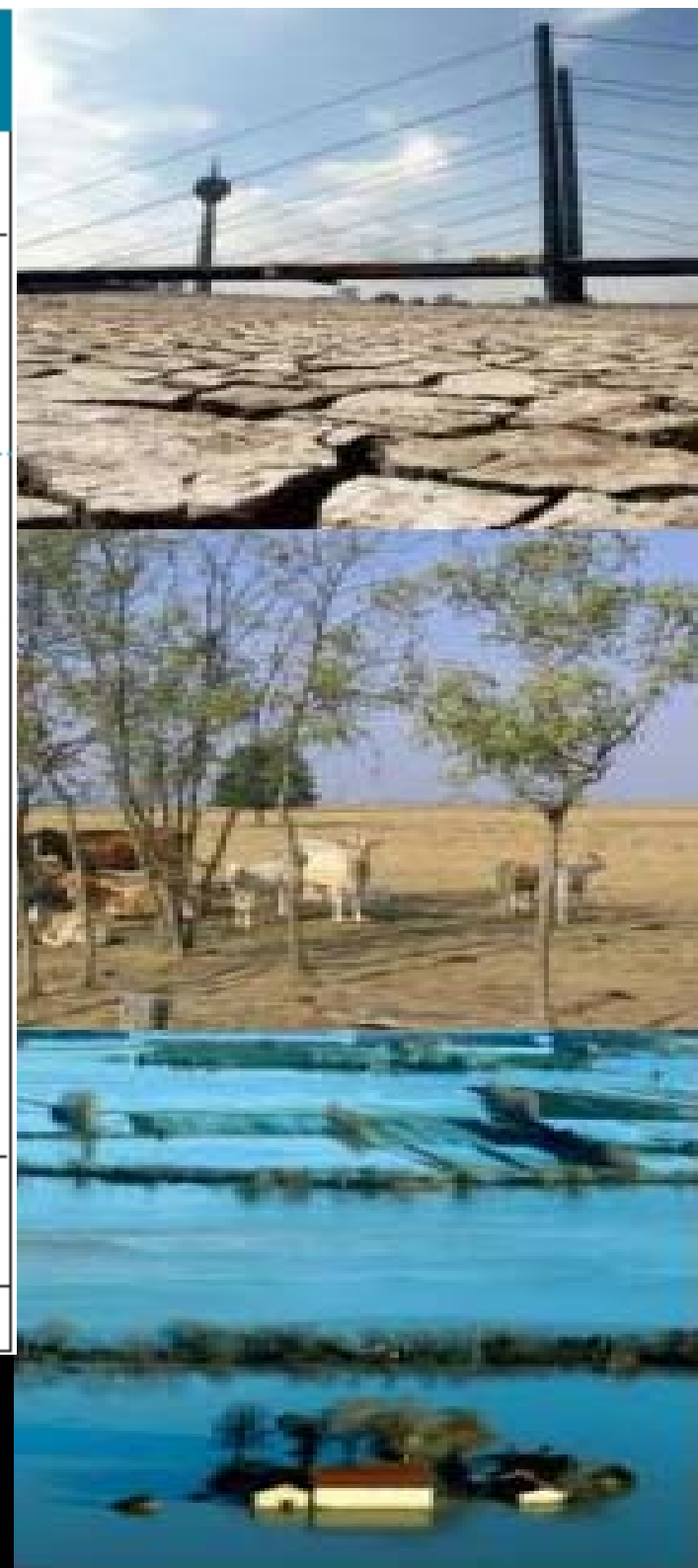
**Fig. 1. Variation of the surface temperature of the Northern Hemisphere over the last millennium**

— 1998 instrumental data (AD 1902 to 1999)      — Reconstruction (AD 1000 to 1980)      — Reconstruction (40 year smoothed)

Northern Hemisphere anomaly ( $^{\circ}\text{C}$ ) relative to 1961 to 1990



Source: Houghton et al. (2001).





# Extreme weather events

- UK flooding – Boscastle 2004
  - £50m estimate of costs

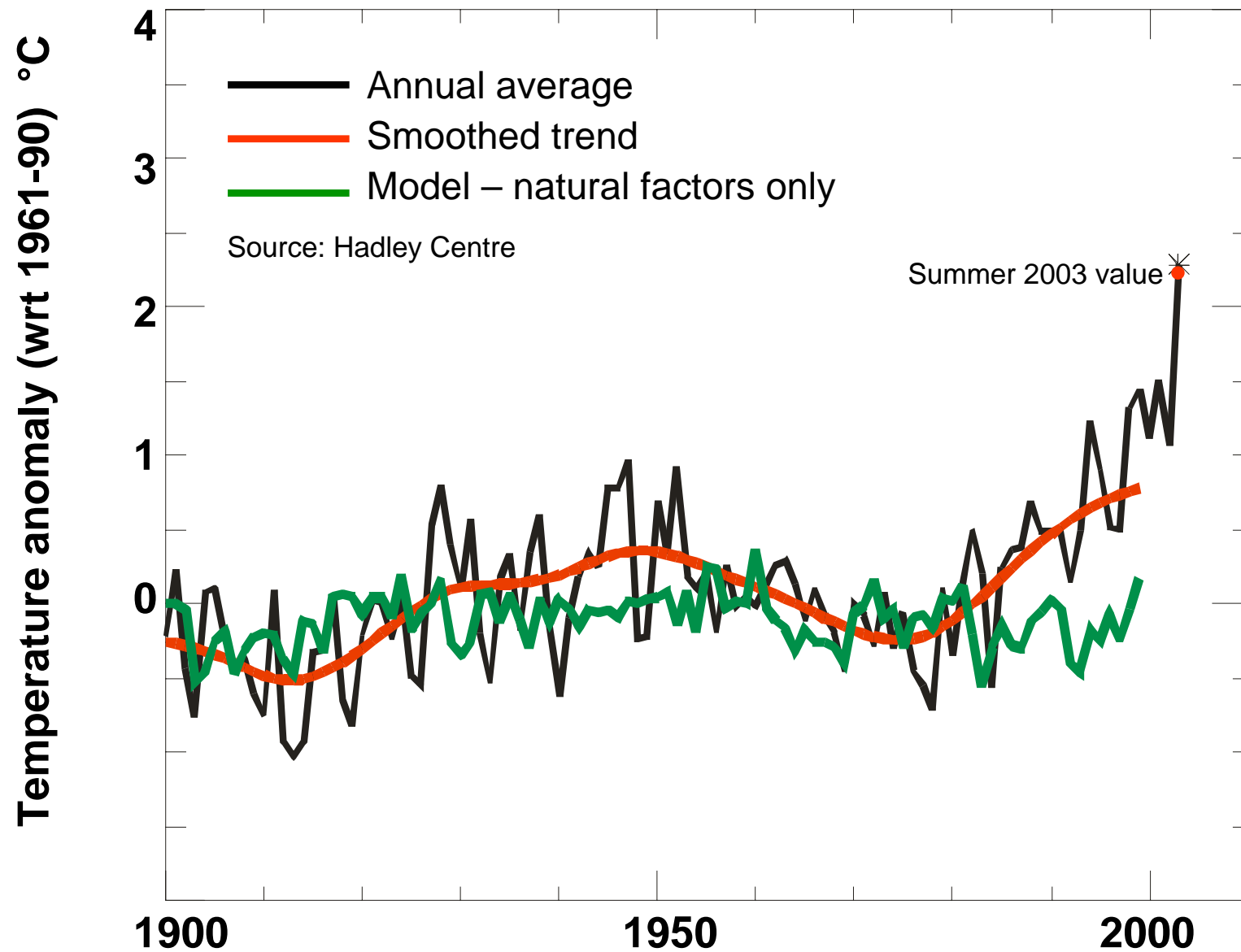


# Extreme weather events

- UK floods, June July 2007
  - Insurance pay-out £\_\_\_\_bn

# Extreme Record events every month and year

## Annual EU summer temperatures







# Changes or Business as usual?

# Climate change 'cost \$60b' in 2003

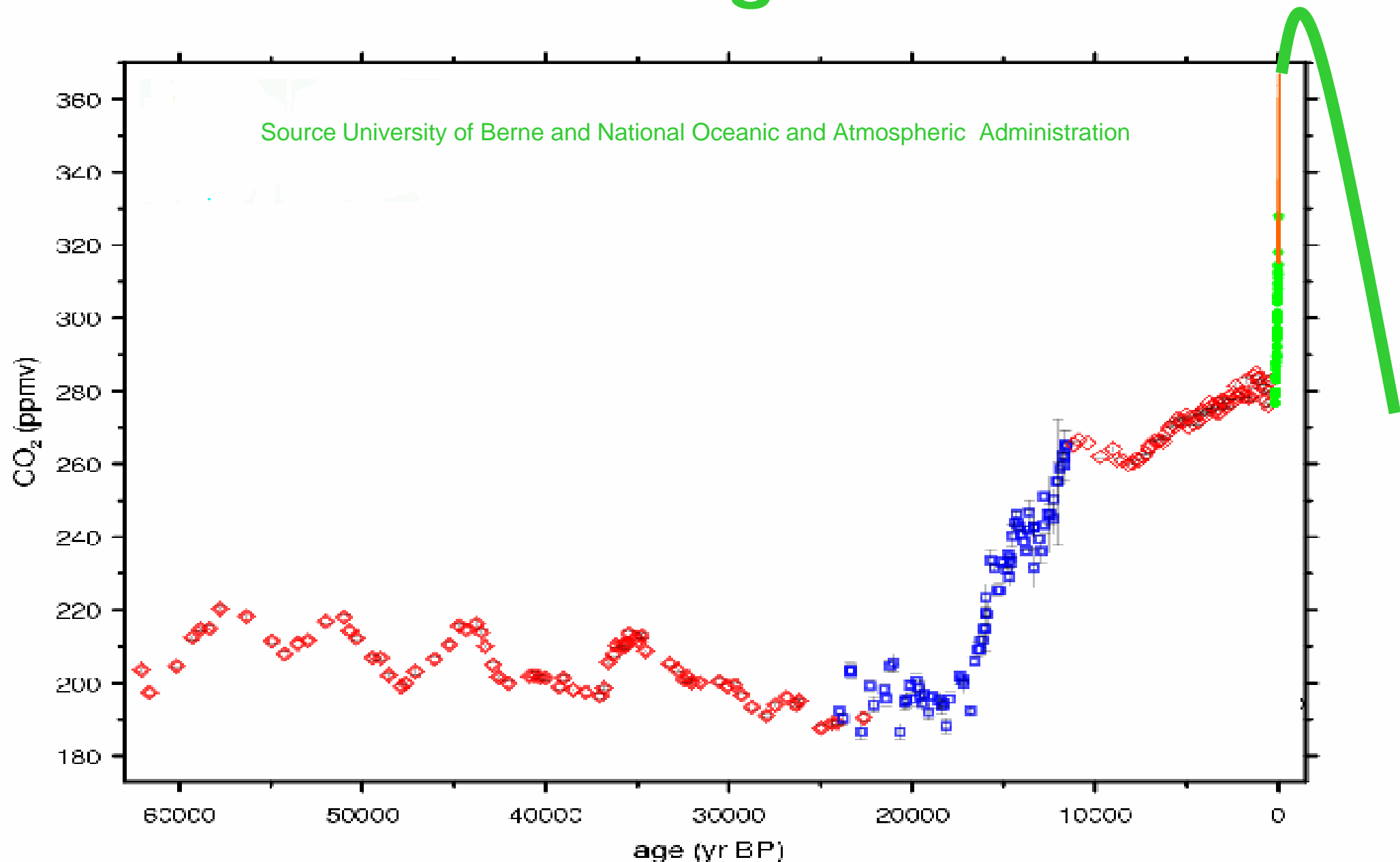
- Climate change may have cost the world over \$60 billion in 2003, triggering a spate of natural disasters from a deadly heat wave in Europe to massive flooding in China
- U.N. Environment Program (UNEP)
- cost of natural disasters had risen 10 percent from \$55 billion in 2002 and was part of a worrying trend of climate change.

# Creating a low carbon economy

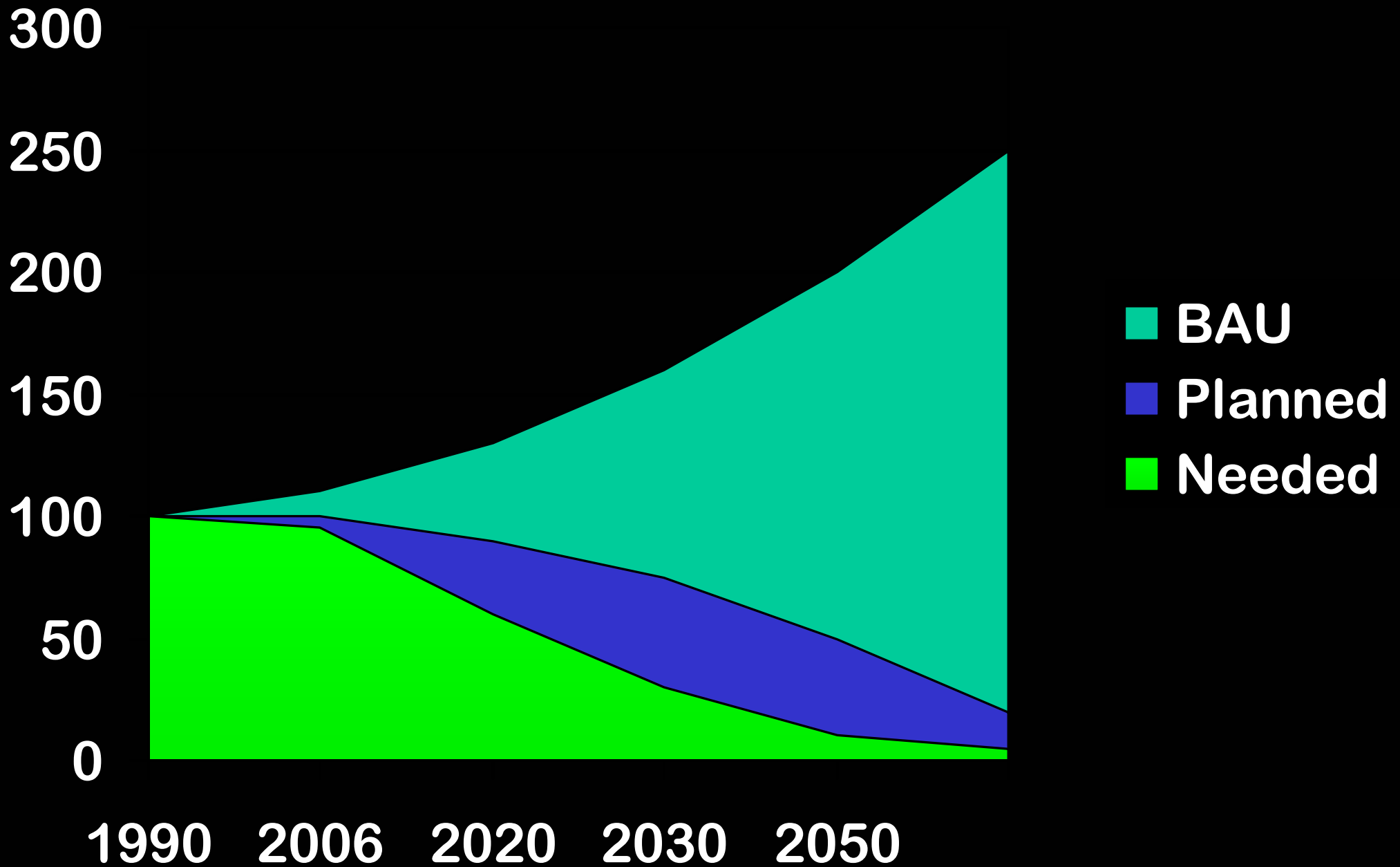
- Energy White Paper February 2003
- Overall objectives:
  - UK to cut CO<sub>2</sub> emissions by 60% by 2050 (QS)
  - real progress by 2020 (not in Queen's Speech 2006)
  - Maintain reliability of energy supplies
  - Promote competitive markets in the UK and beyond
  - To tackle fuel poverty
    - poor unable to heat inadequately insulated homes
    - rich unable to cool 100% glazed façade offices

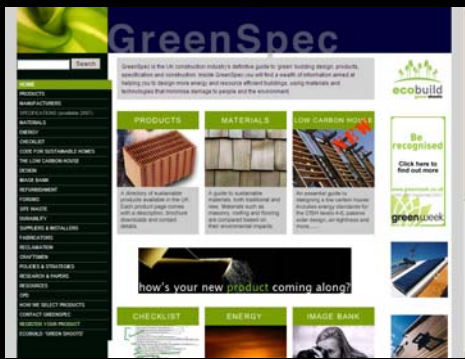
# CO<sub>2</sub> levels over next 43 years?

## How do we get there?



# CO2 output based on 1990 levels





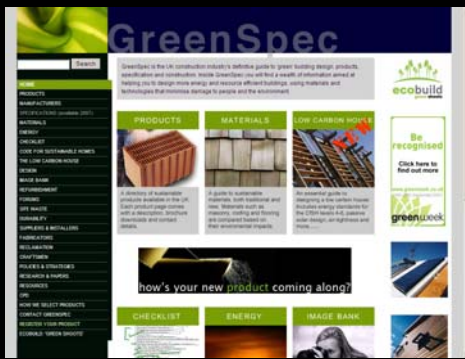
3% growth  
Every government's  
aim

2070 International  
Financial melt down

6% growth  
Disaster costs  
insurance payouts

the rhino cometh . . . .





# Efficiency Drive?

- PPS1 suggests local/regional targets should be set
- 2006 Code for Sustainable Homes and Building Regulations Part L in conflict
- 2007 GO-East prevents Cambridge CC T&C Planners from requiring improved efficiency of future development above Building Regulations



# The real scientists are in agreement

- Number of peer reviewed articles in scientific press in previous 10 years: 928
- Percentage of articles in doubt about the clause of global warming: 0%
- Consensus on this scale is rare indeed in the scientific community

# Public Awareness of issues

- The media promotes another story
- Number of articles in popular press about global warming in past 14 years: 636
- Percentage of articles in doubt about the cause of global warming: 53%
- No wonder the public are confused

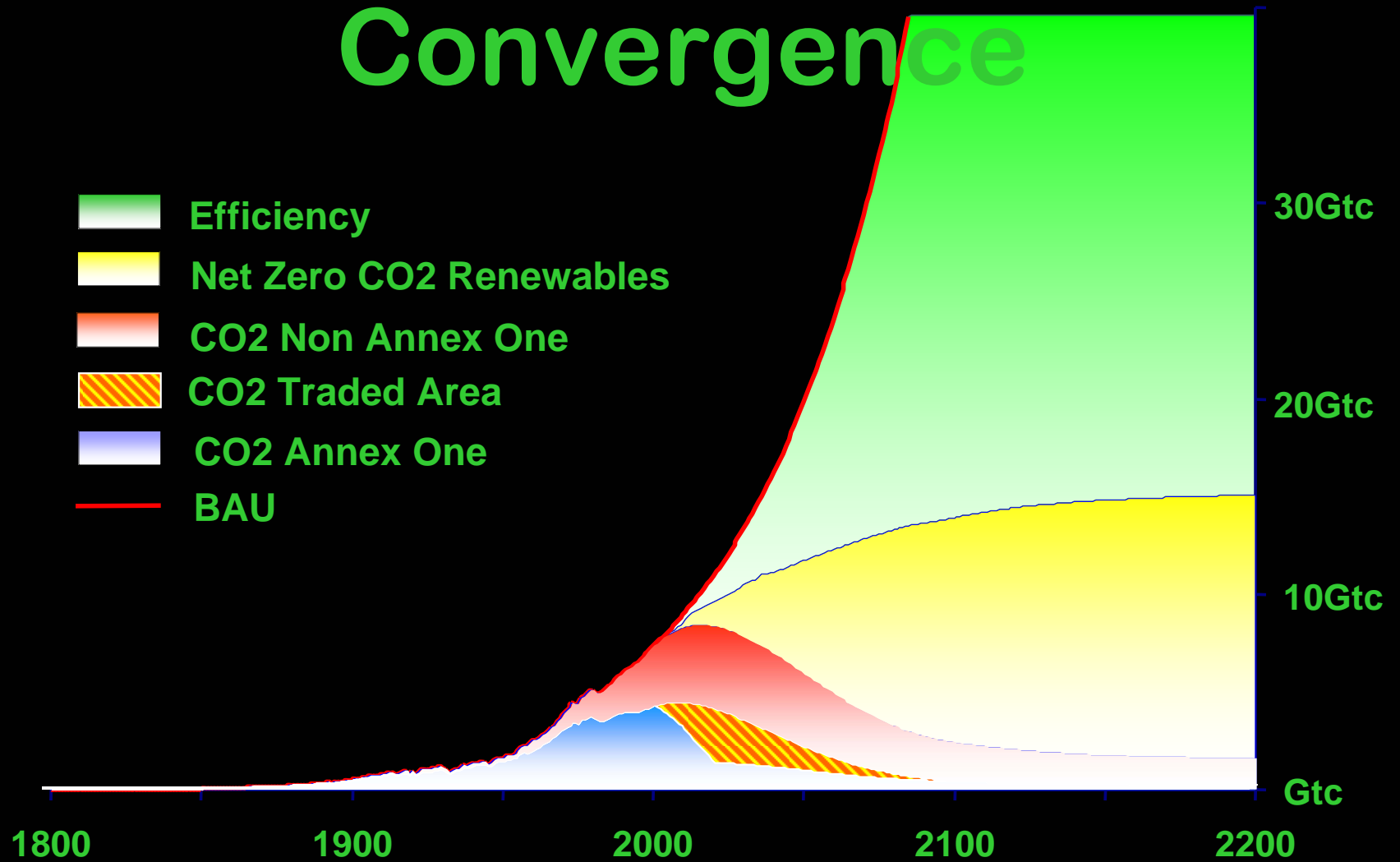
# Globalisation of Consciousness

- Comic Relief
- Band Aid
- Live Aid
- Live Earth
- G8 Summit Protests
- Globalisation Revolts
- Fairtrade popularity market penetration
- Supporting Local Producers (Food)

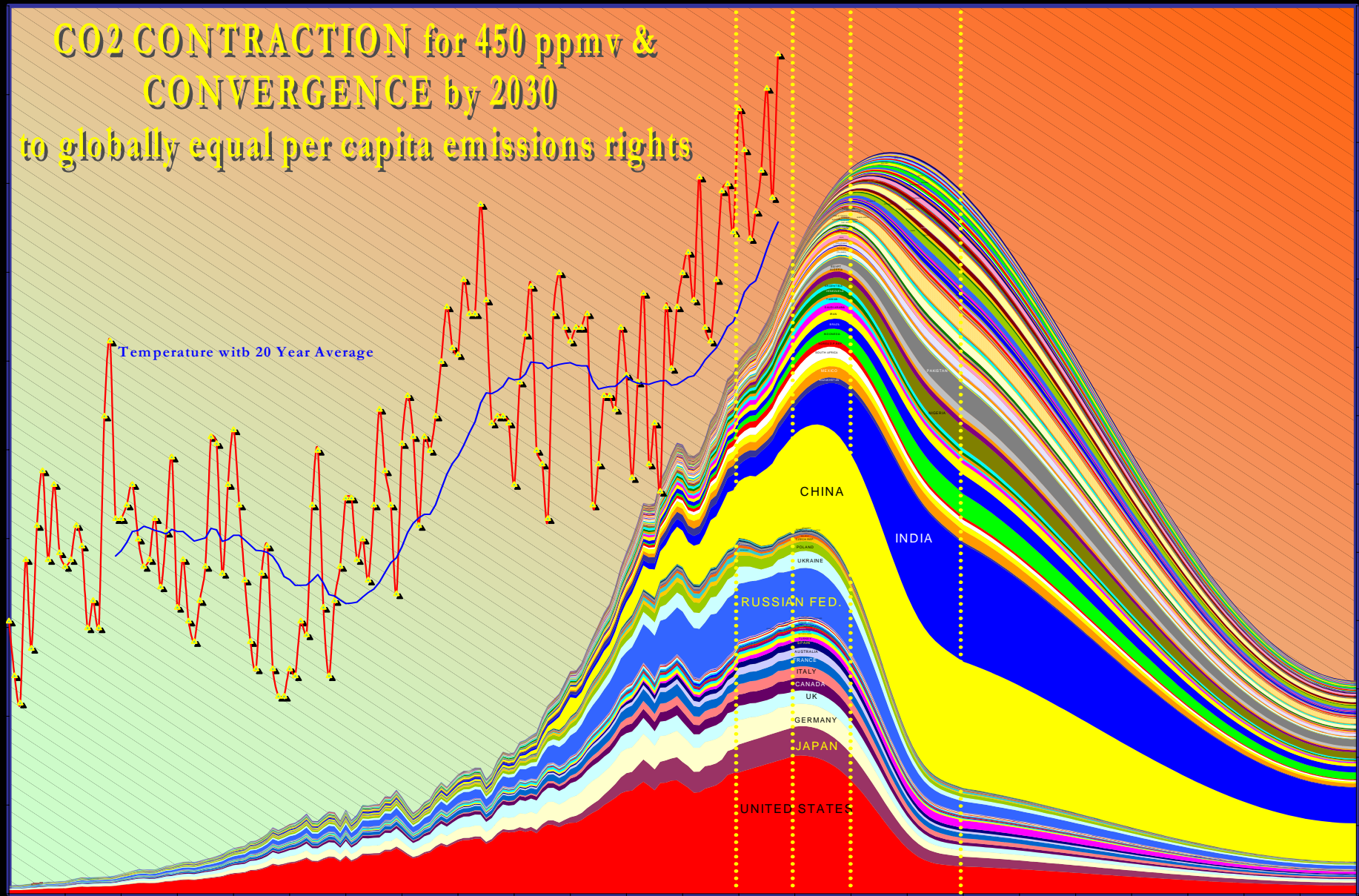
# Procurement Rules

- Anti Local Procurement
- EU European Union Procurement Directive V2
- WTO World Trade Organisation Rules
- Encourage Fairtrade and non-FSC

# Contraction & Convergence

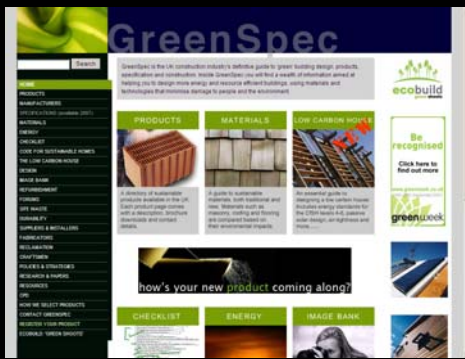


# “C & C” – The Classic Image



# Sir Nicholas Stern Report

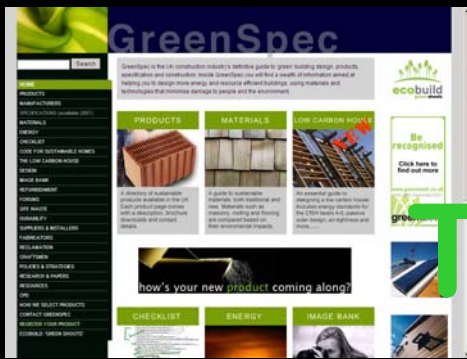
- The Economics of Climate Change
  - Nov 2006
- Investment in environment now
- Short term cost:
  - 1% of Global GDP (gross domestic product)
- Long term cost:
  - 11-14% of Global GDP if not dealt with now



# The Stern review

- examines the economics of climate change and stabilising of greenhouse gasses.
- It estimates that the cost will be high – about 1% of global GDP
- but that the cost of not doing so will be significantly higher, estimated to be between 5% and 20% of global GDP.





# The Green package

- Dec 2006
- Code for Sustainable Homes
- Zero Carbon Homes by 2016
- But still a voluntary code of practice
- Level 1 = Building Regulations Part L
- Level 6 = Low Carbon

The 'Greenhouse Effect'



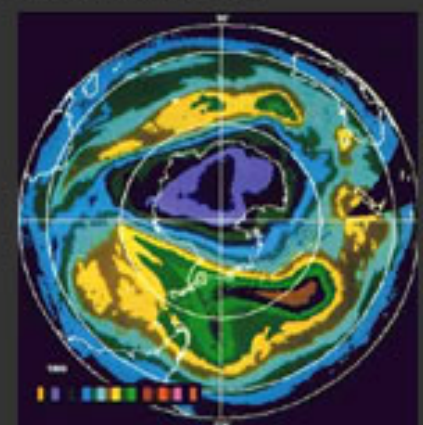
flooding  
Pollution



desertification



melting ice caps



ozone depletion



acid rain

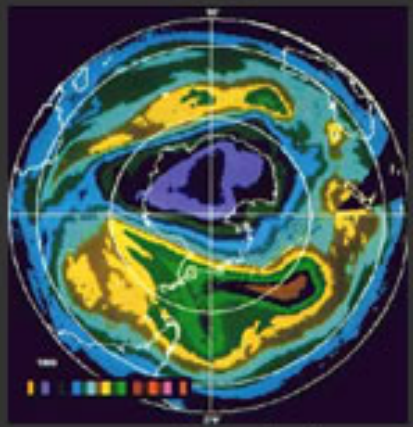


river pollution



toxicity

Pollution



ozone depletion



acid rain



river pollution



toxicity

Resource depletion



fossil fuels



forests



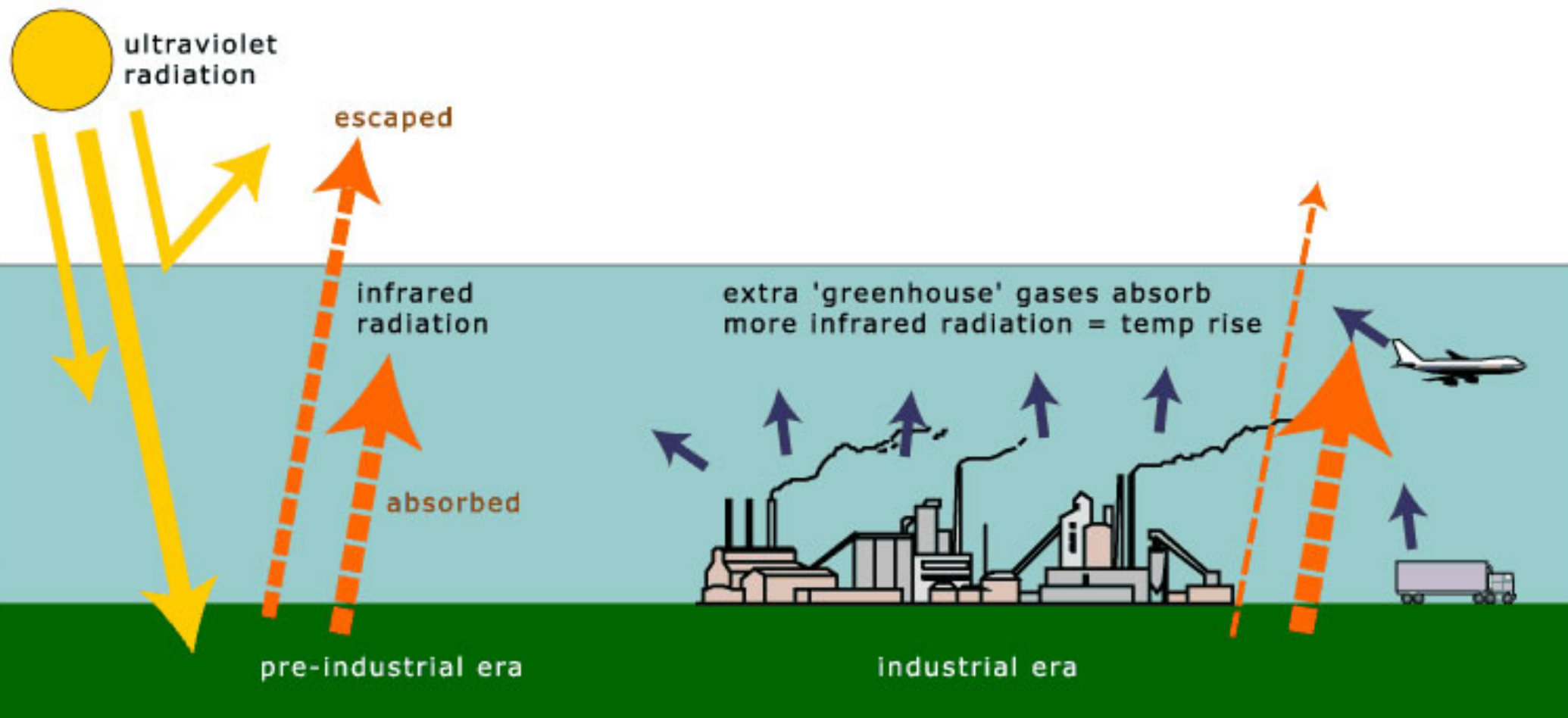
minerals



water

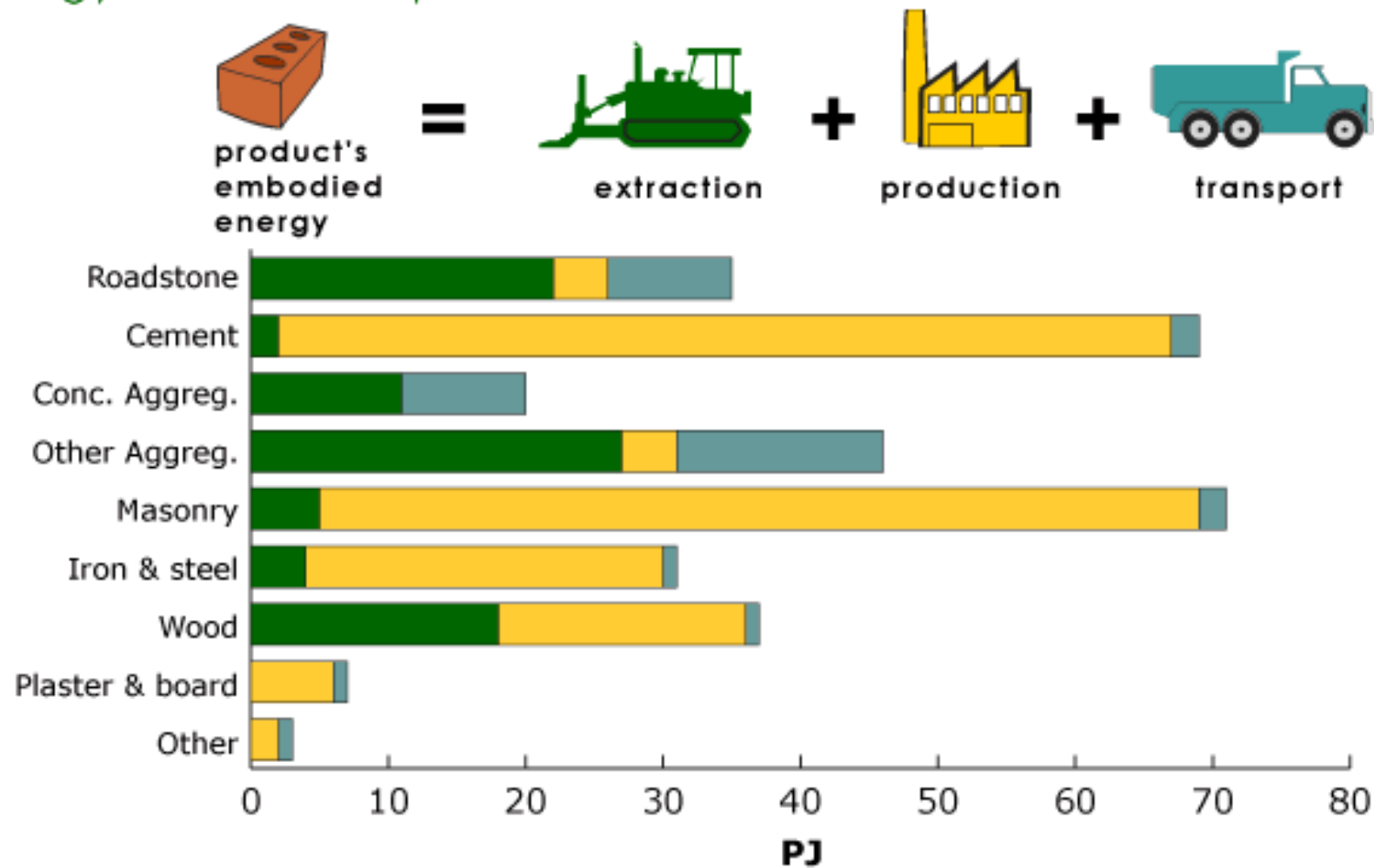


# Greenhouse gases

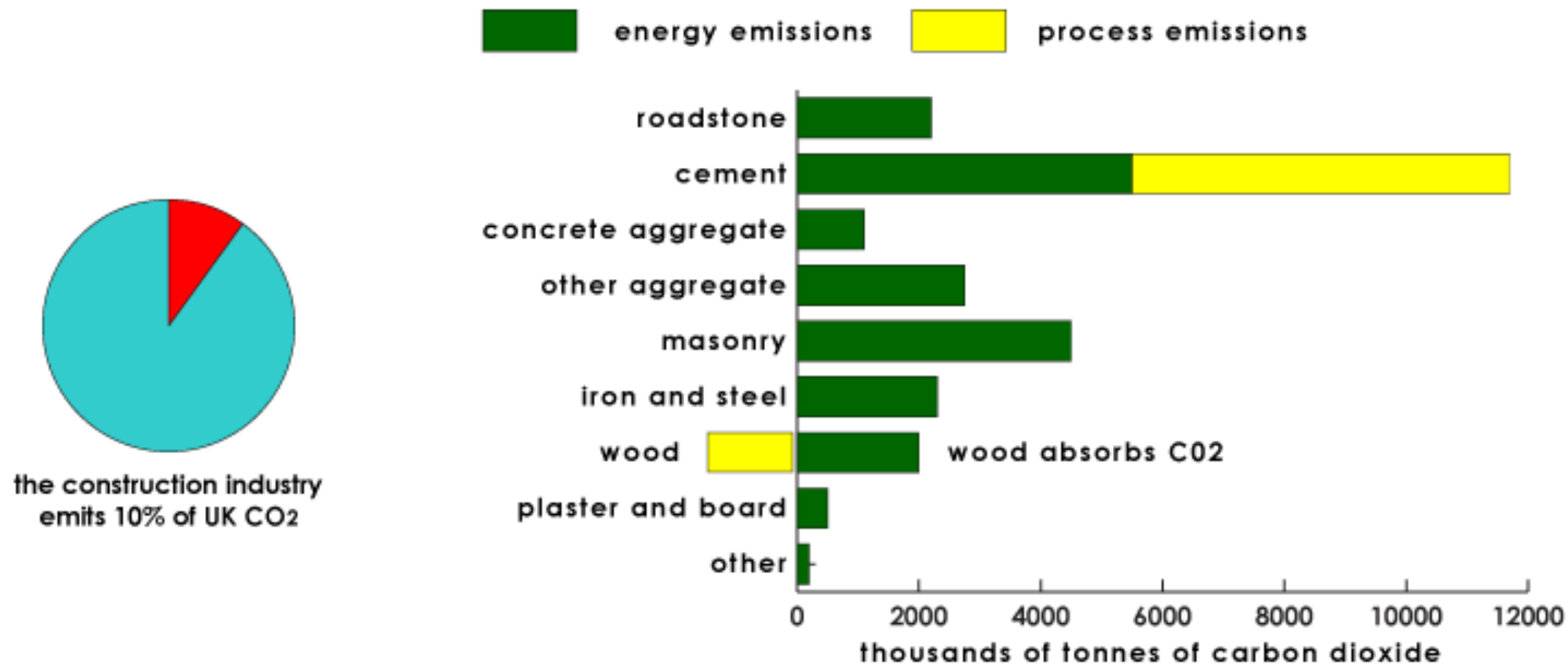


## Energy in the UK

Energy used in the production of construction materials



## CO<sub>2</sub> emissions from the production of construction materials



What are greenhouse gases?

Where the energy comes from

**currently**

**33%**



**oil**

**41%**



**gas**

**16%**



**coal**

**9%**



**nuclear**

**1%**



**renewable**

**in 2020**

**37%**

**47%**

**8%**

**3%**

**5%**

The UK's declining energy reserves

- By 2006, the UK is expected to be importing around 15% of its gas.
- By 2006 the UK is likely to be a net oil importer
- Nuclear power stations will be progressively decommissioned
- Coal is likely to have only a limited role
- On current policies, initiatives to promote domestic renewable energy demand will be insufficient to reduce dependence on imported gas & oil

# Lighting

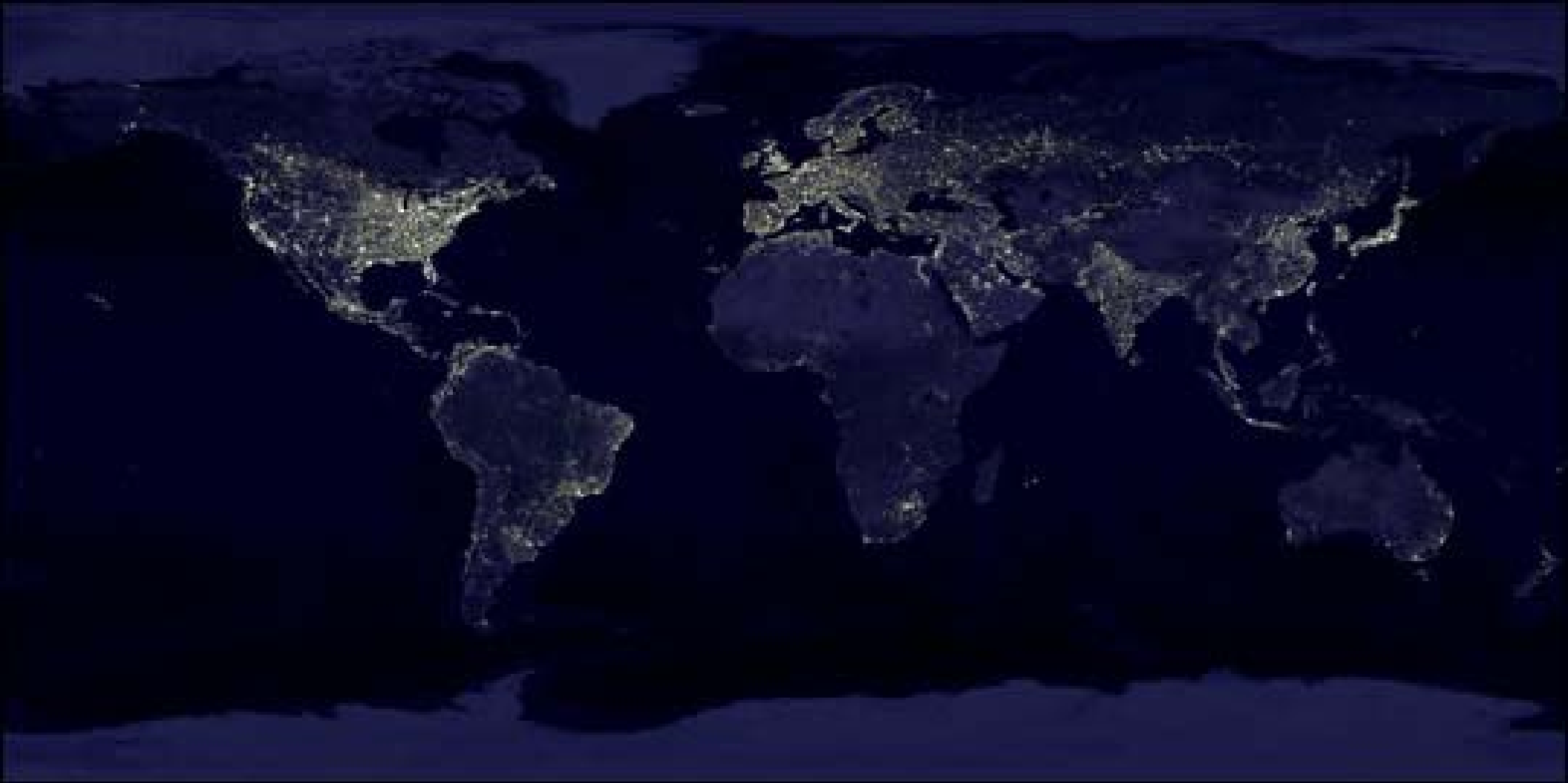


- UK lighting consumes 20% of electricity demand
- More in many other countries
- 40% in Thailand



Wastefulness

Light Pollution = Energy ~~Profligacy~~



# Construction waste

from.....

12m tonnes



production

+

10m tonnes



construction

+

30m tonnes



demolition

=

to.....

24m tonnes



recycling

28m tonnes

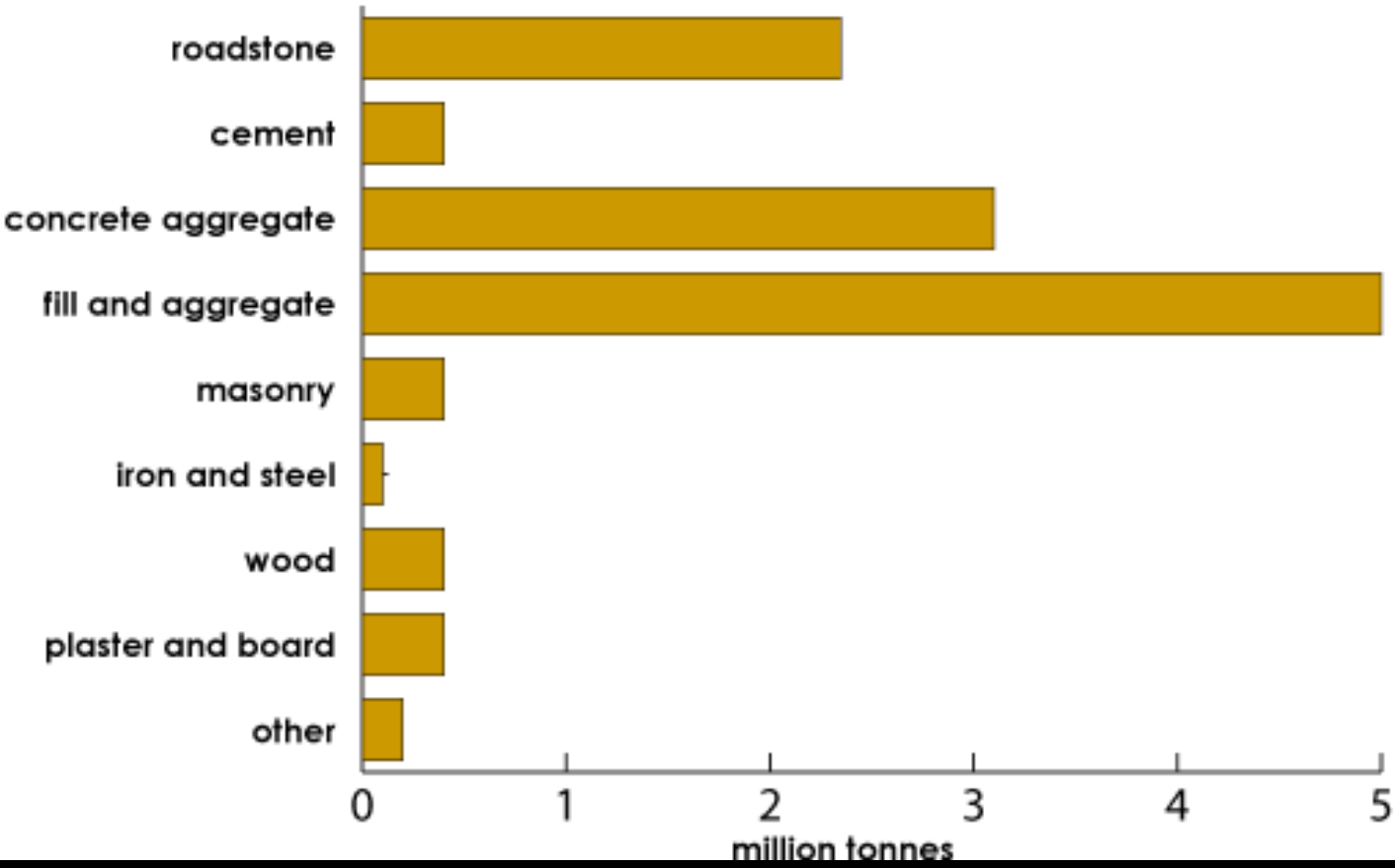


landfill

- landfill contributes 46% of the total UK methane emissions
- methane is 21x more potent a greenhouse gas than CO<sub>2</sub>

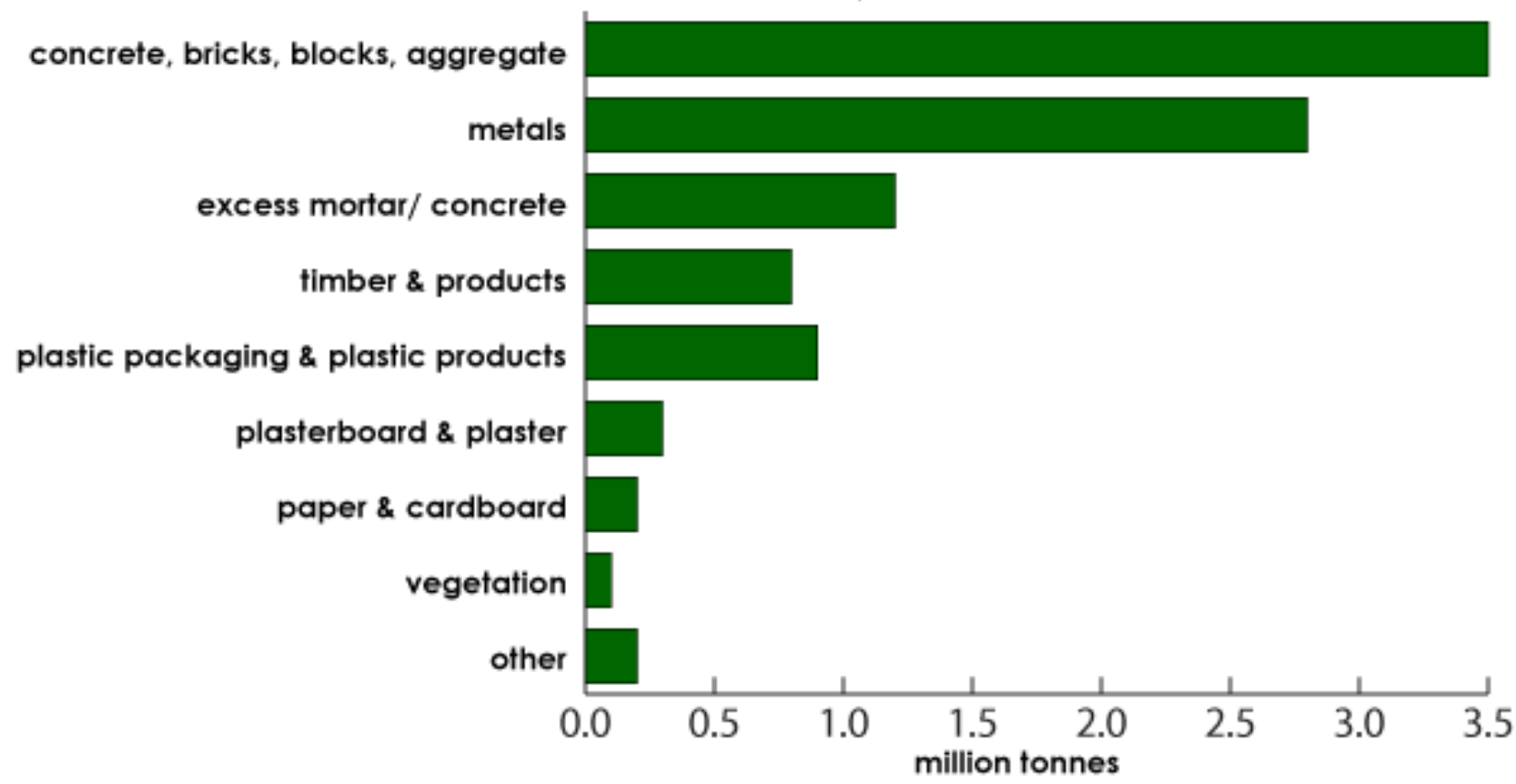
# Construction waste

breakdown of waste from materials production



# Construction waste

breakdown of waste from the construction process



# The built environment

- Consumes about 50% of energy produced (transport 25% and industry 25%)
- Nearly 50% of CO<sub>2</sub> emissions in the UK are caused by building, maintaining and occupying buildings
- Improvement in building design would have a significant impact on emissions and energy consumption
- Landscape: Waste, Embodied energy in materials, Transport, Lighting, Pumps,

# How does this affect me?

- How can I have any influence on it all?
- EA: don't wait for the other person to start, you show the way, they will follow
- Environment is everybody's responsibility
- All the contracts, conversation and contacts you have, you will show the other parties what they can copy.



**We (average UK Citizen) live a 3 planet lifestyle, we only have one**



**For every one us to continue to do so  
2 other people have to live a zero planet life style.  
Ethiopia has already been there Darfor is there now and  
there are not enough of them to share between us.  
We each need to sponsor two Darforians to keep them on  
the brink of death to maintain our lifestyles**

# Challenges

- On the face of it buildings would seem to be the first most important things for those interested in 'green' design.
- But in fact it is a tricky issue for many designers and their clients.
- Client's are not asking for change
- We haven't seen a need to change
- We don't want to change
- We wouldn't know how to change
- So we don't change

# Fresh Intake

- LSBU and many others are training students to go out into the world to design buildings
- The Construction Industry needs you to come and sort us out
- We need a fresh new look at the way we do things
- We need to radically change
- Are you up for the challenge?