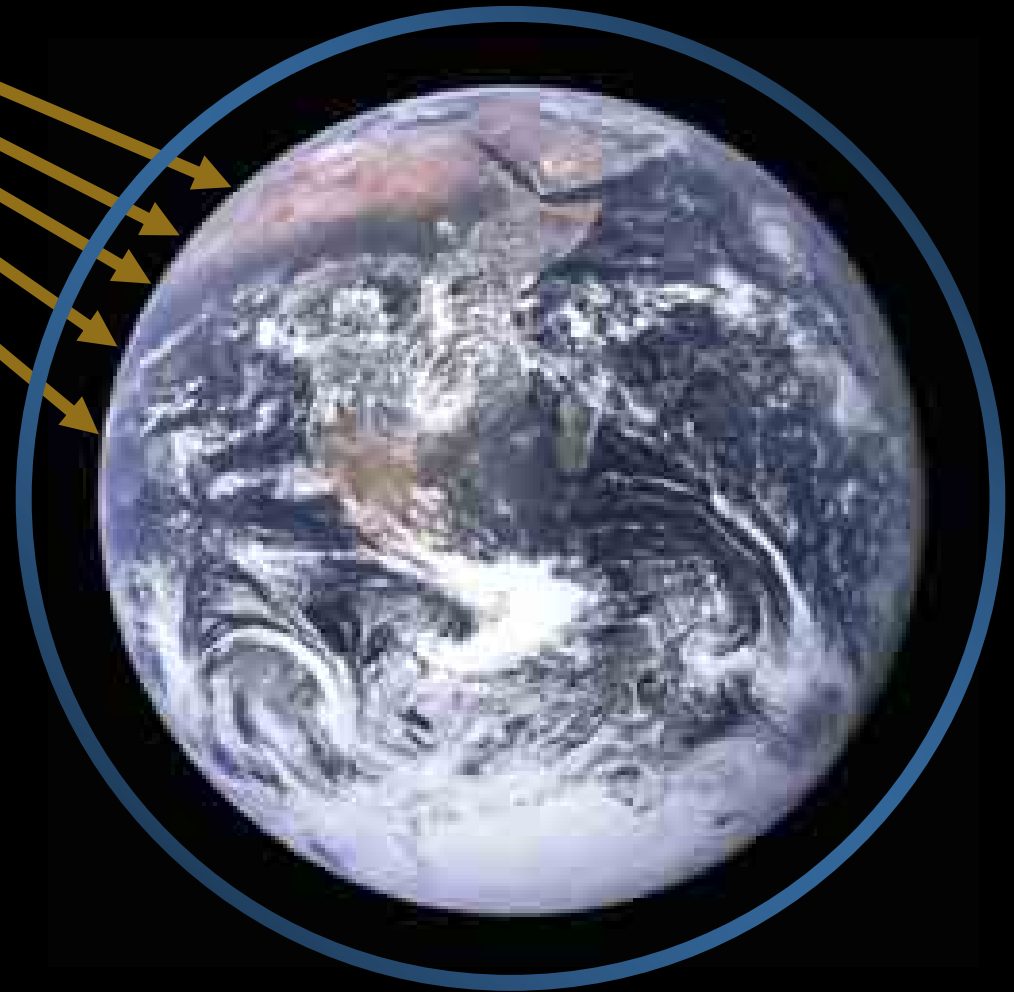
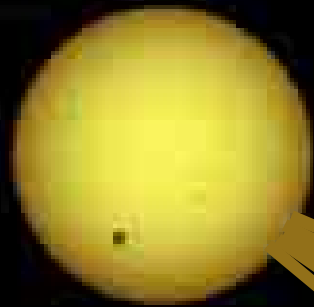
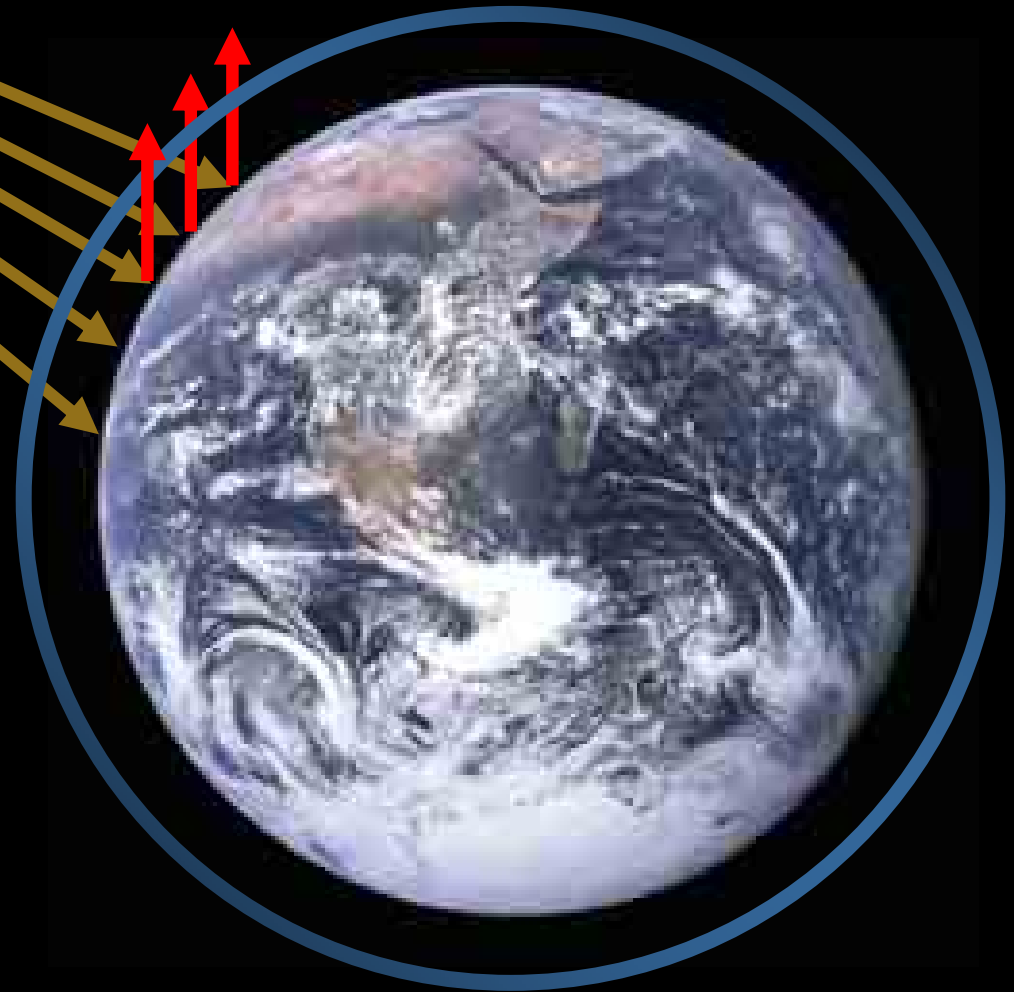


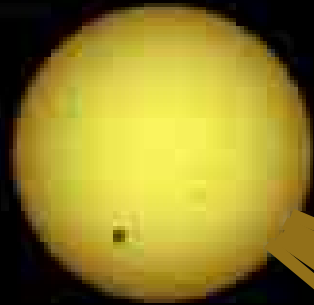
**Solar radiation
passes through the
atmosphere warming
the earth**





**Some of the energy is
radiated back into
space**

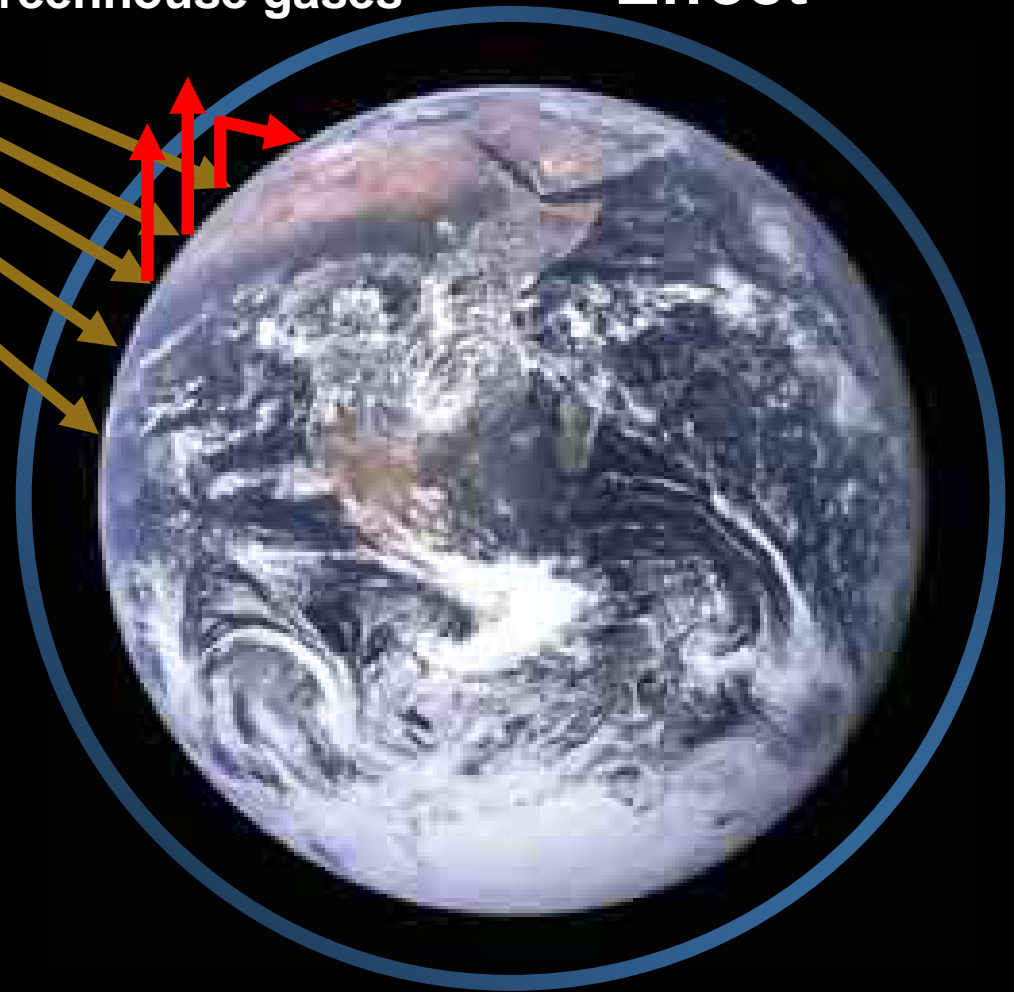




Some of the outgoing radiation is trapped within the atmosphere by the greenhouse gases

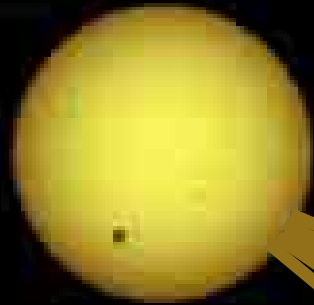
The “Greenhouse Effect”

The Earth would be 33° colder if it weren't for the greenhouse effect



The problem is since industrialisation we've
been doing this...

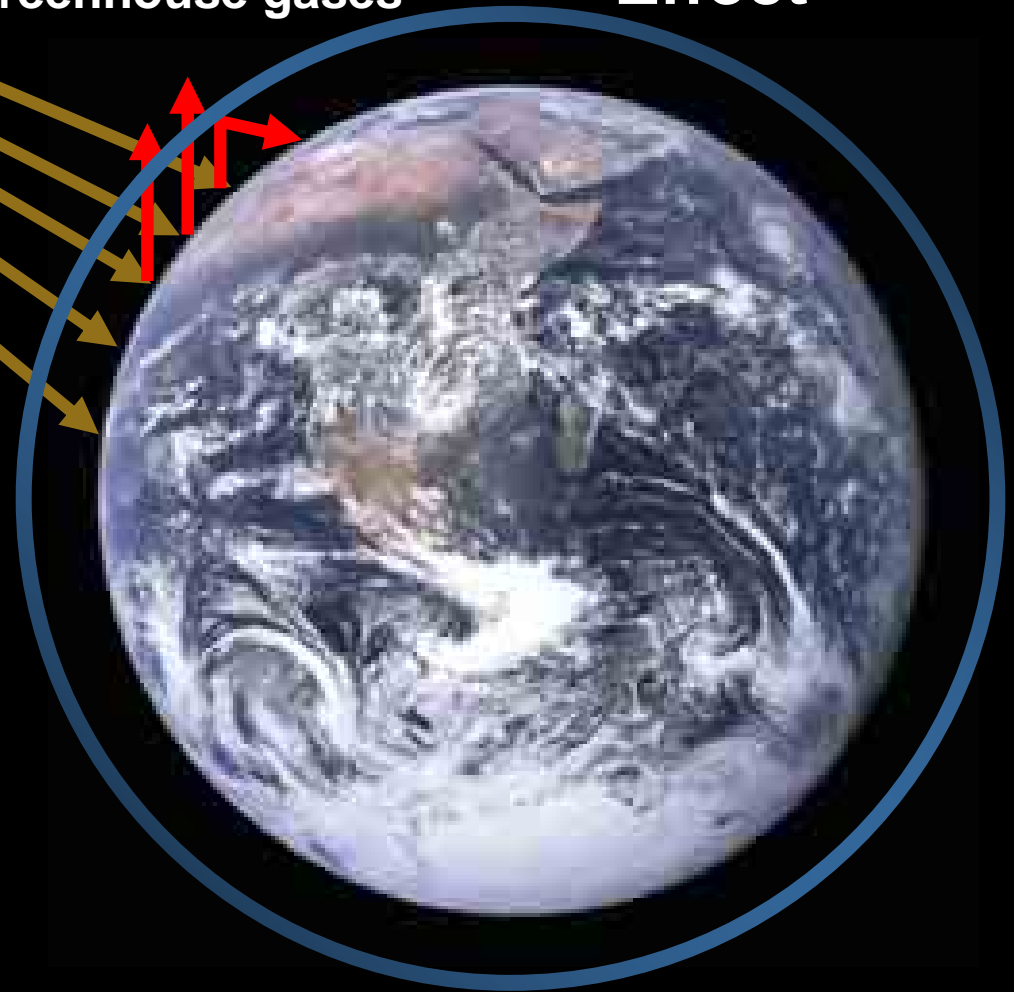


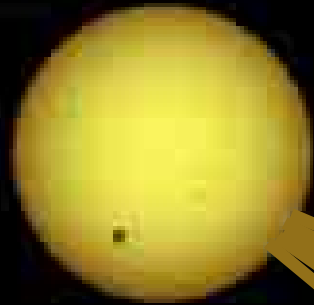


Some of the outgoing radiation is trapped within the atmosphere by the greenhouse gases

The “Greenhouse Effect”

The Earth would be 33° colder if it weren't for the greenhouse effect





More of the outgoing
radiation is trapped
within the atmosphere by
the increasing
greenhouse gases

**The
“Enhanced
Greenhouse
Effect”**



The Whitechuck Glacier (USA) retreated 1900m between 1973 and 2006



1973



2006

The Boulder Glacier retreated 450m
between 1987 and 2005



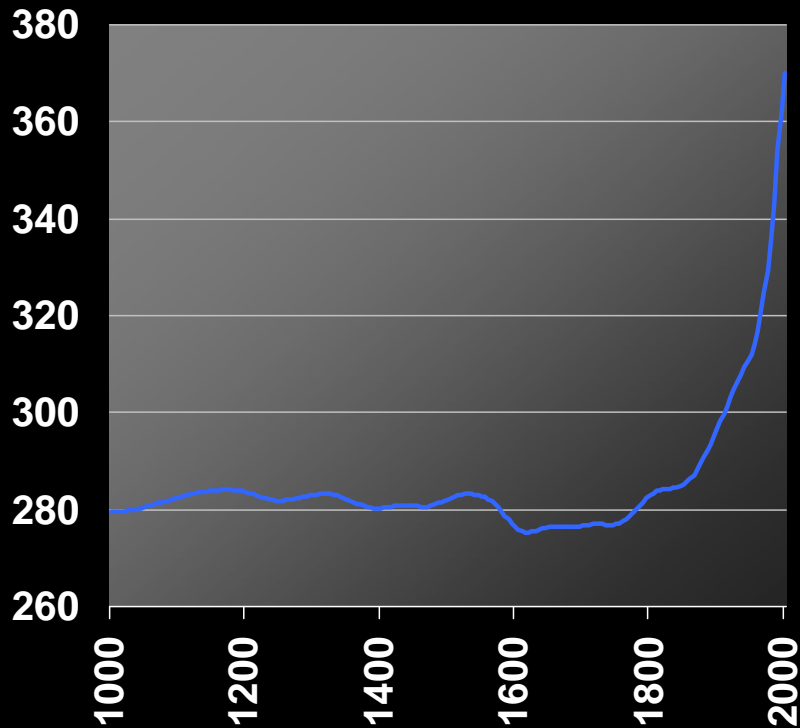
Quelccaya Ice Cap

Peru, 1977

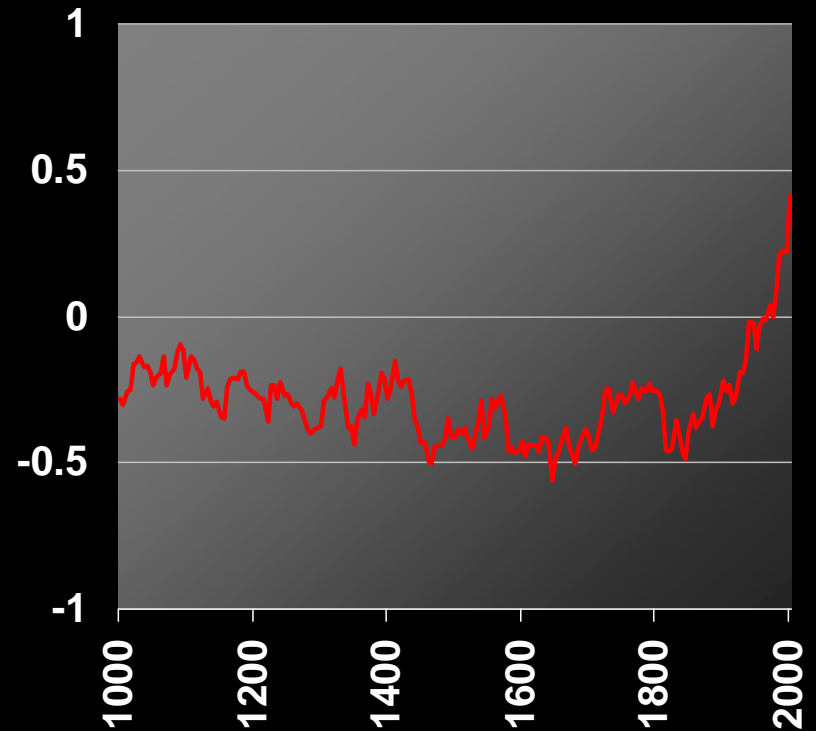


1000 Years of CO₂ and Global Warming

Atmospheric CO₂

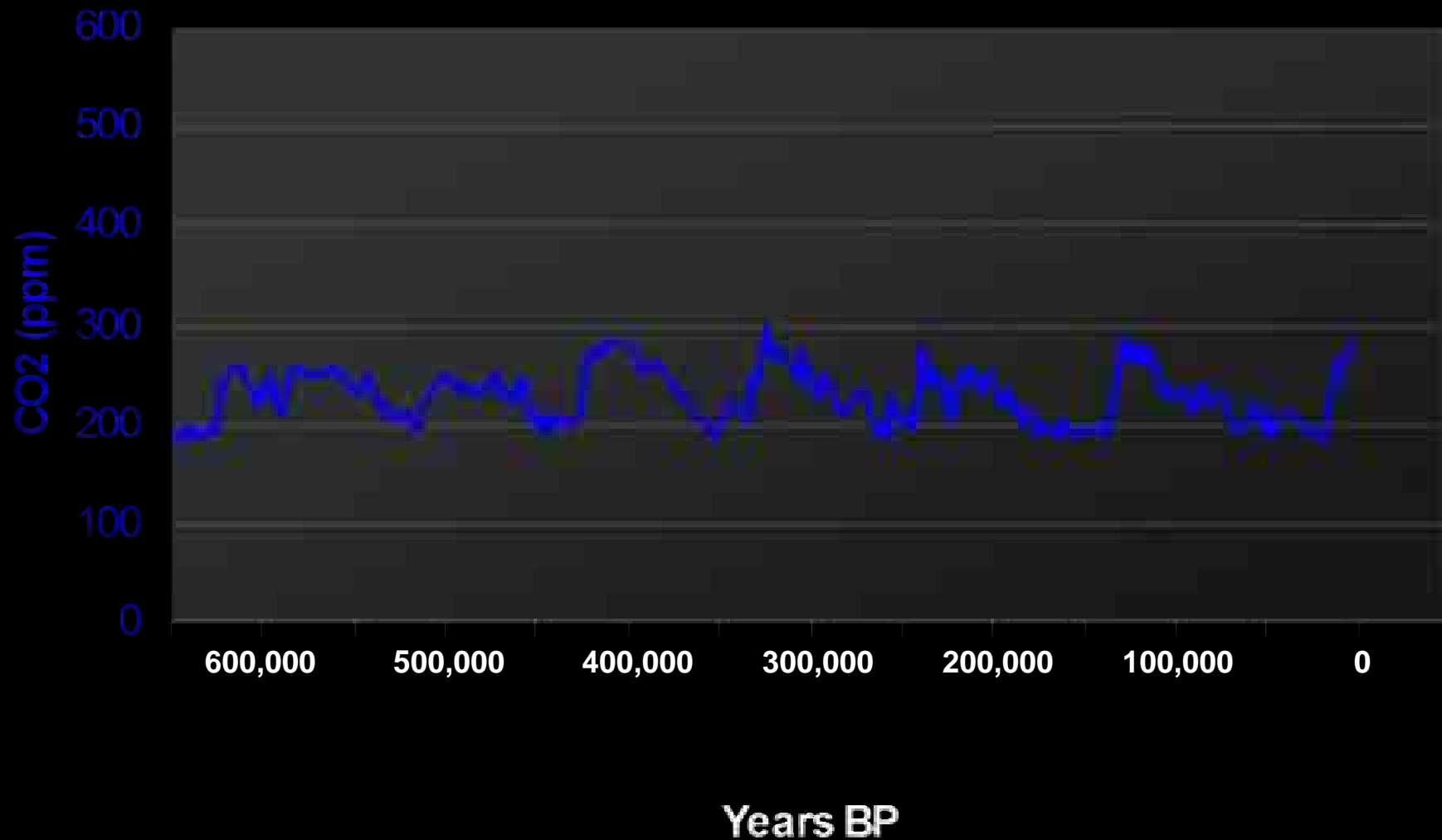


Temperature (Northern Hemisphere)

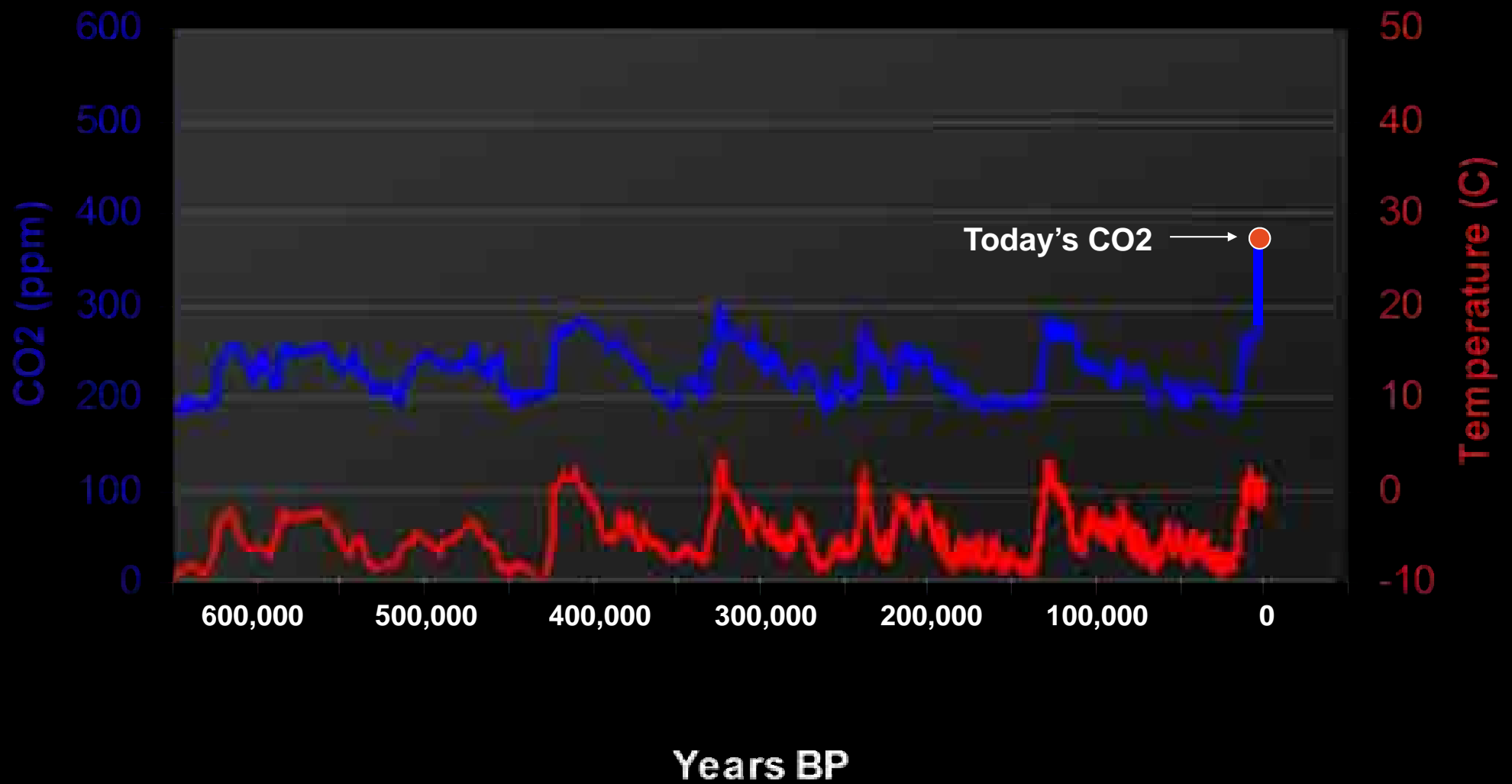


Source: NOAA

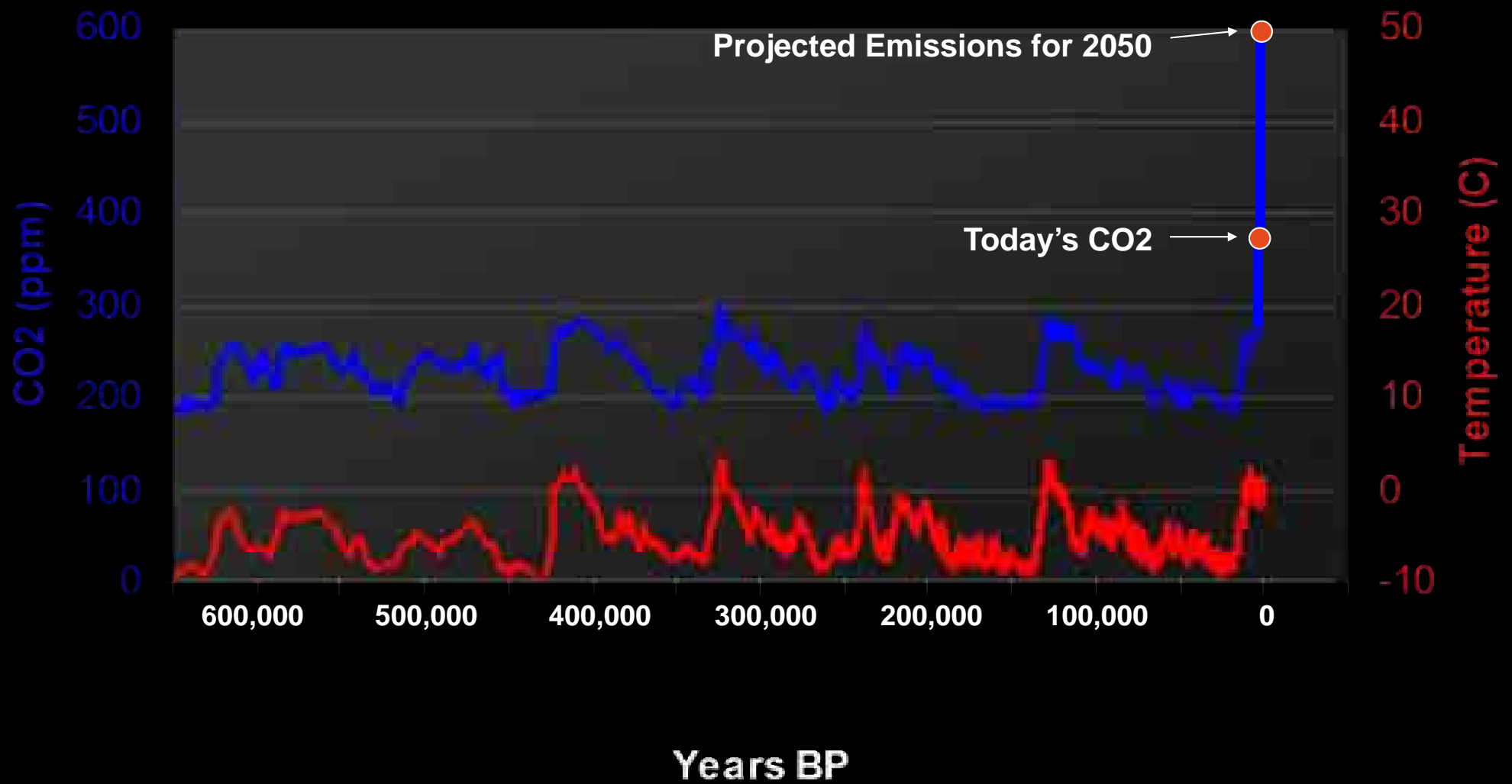
650,000 Years of CO₂ and Global Warming



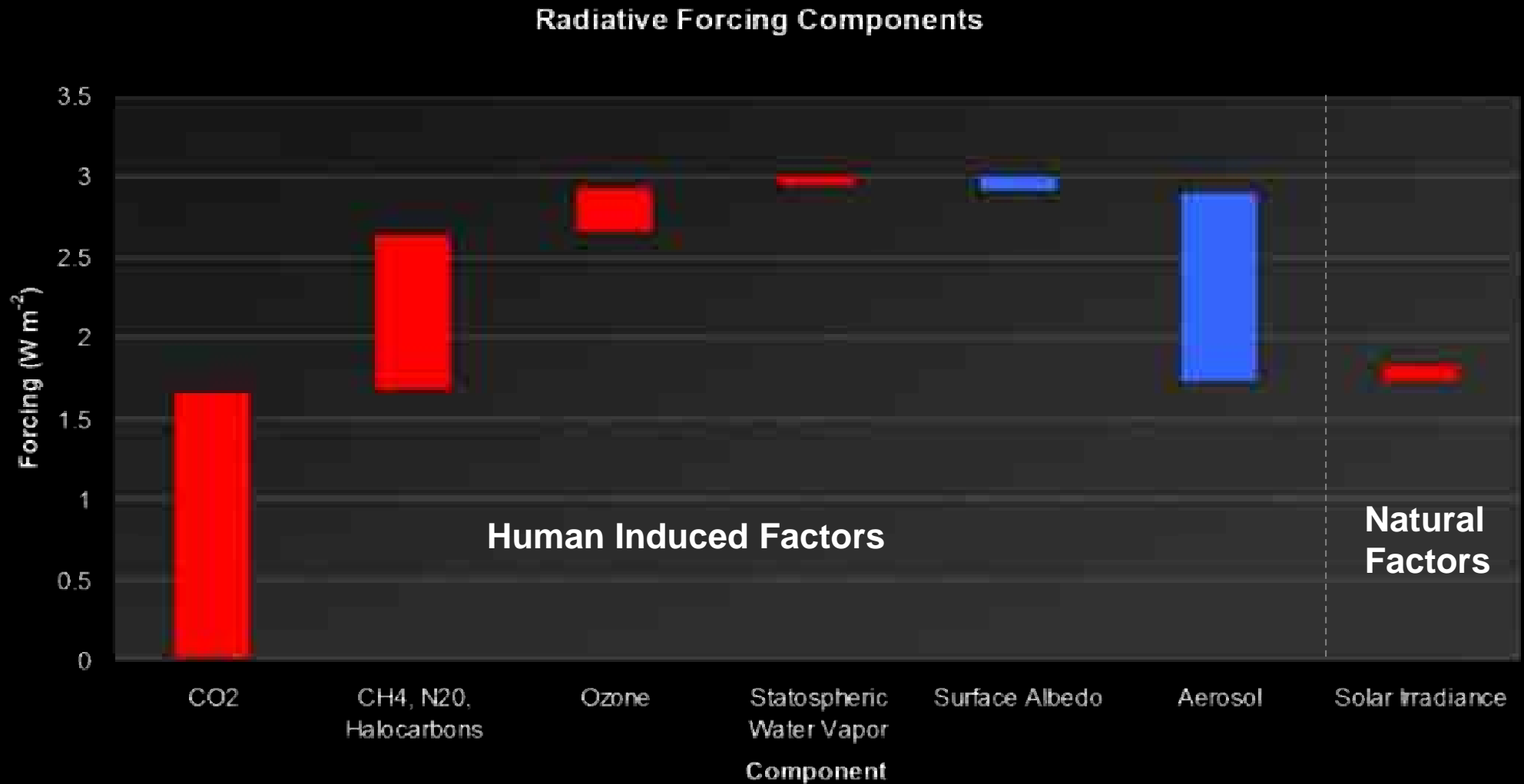
650,000 Years of CO₂ and Global Warming



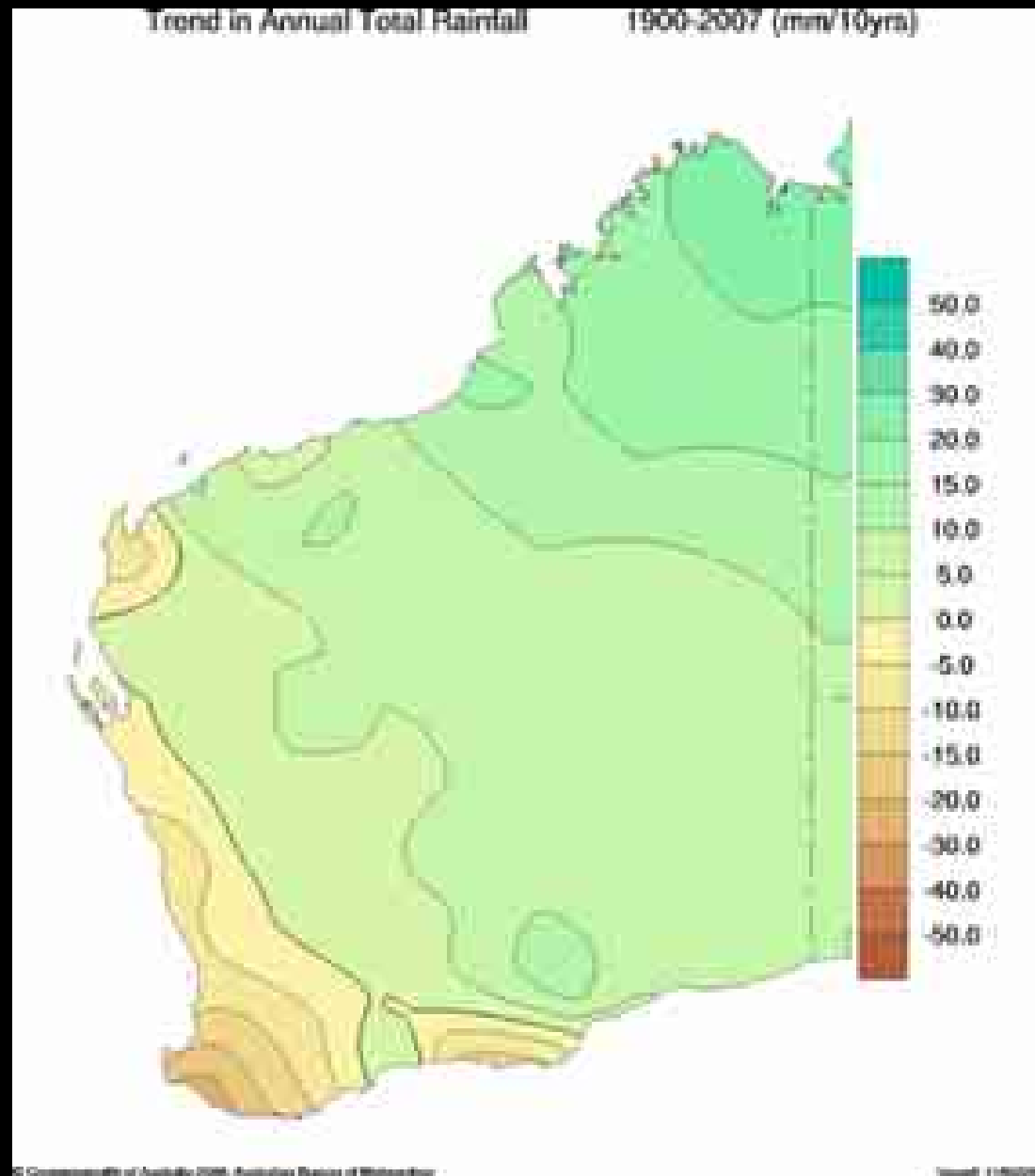
650,000 Years of CO₂ and Global Warming



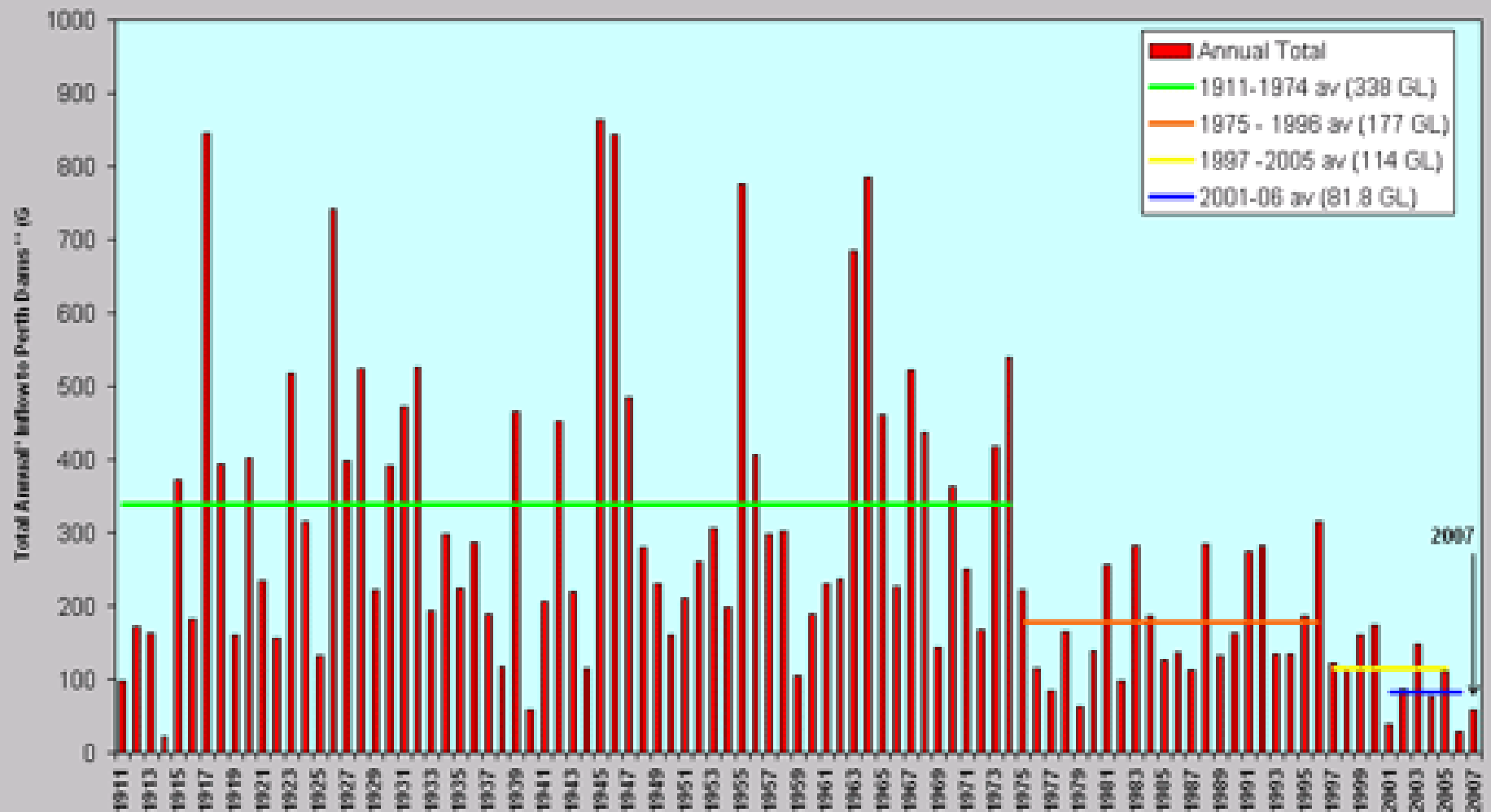
The warming is primarily due to Human Activities



Rainfall is declining in the southwest



Streamflow in Perth Hills has dropped by 75%



Notes:

- A year is taken as May to April
- 2007/08 inflow to 5th September 2007

Extremes in Australia

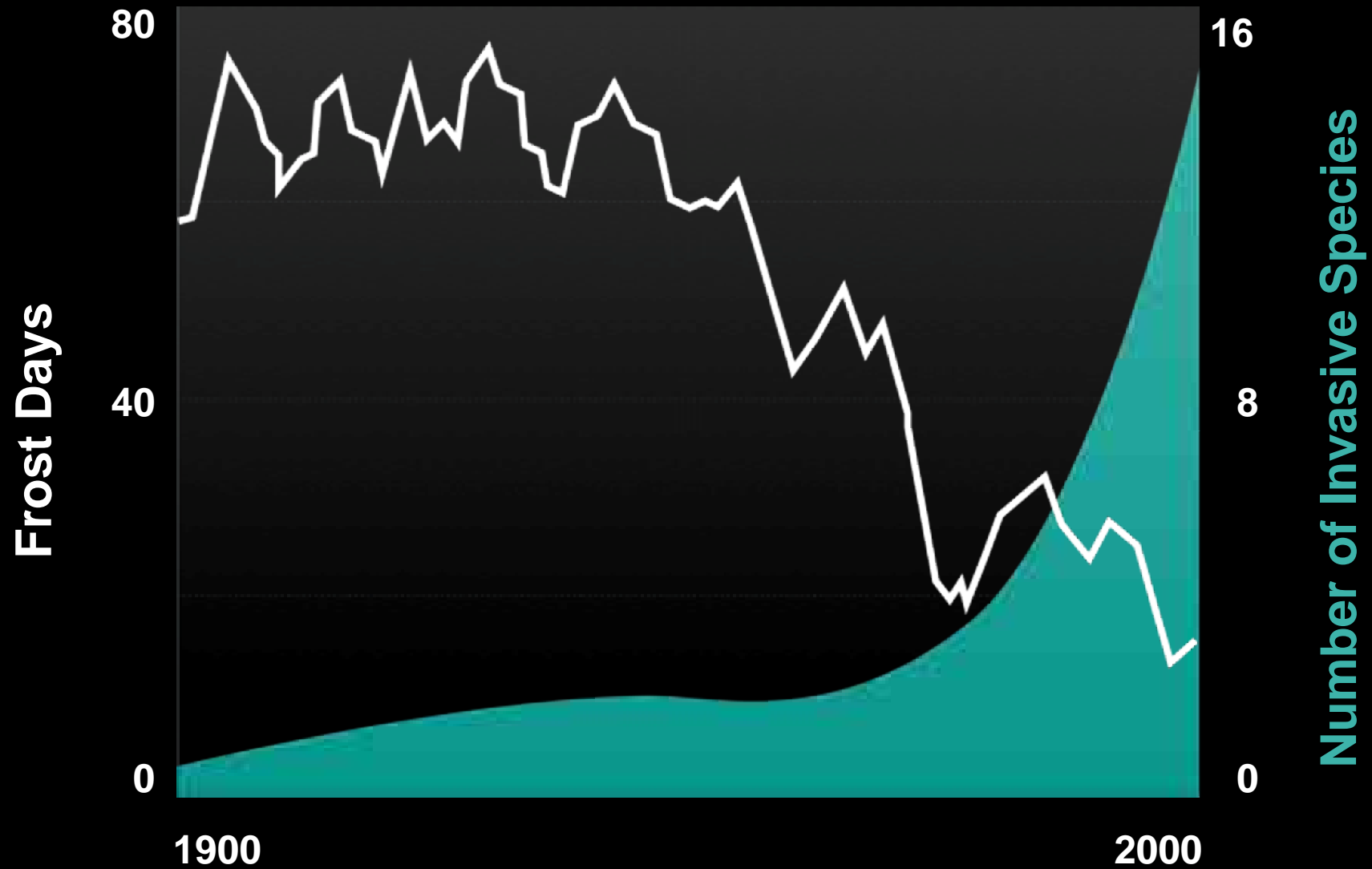


Murray Darling Basin
August 2007



Hunter Valley
June 2007

Shifts in Seasons



Mountain Pine Beetle Damage

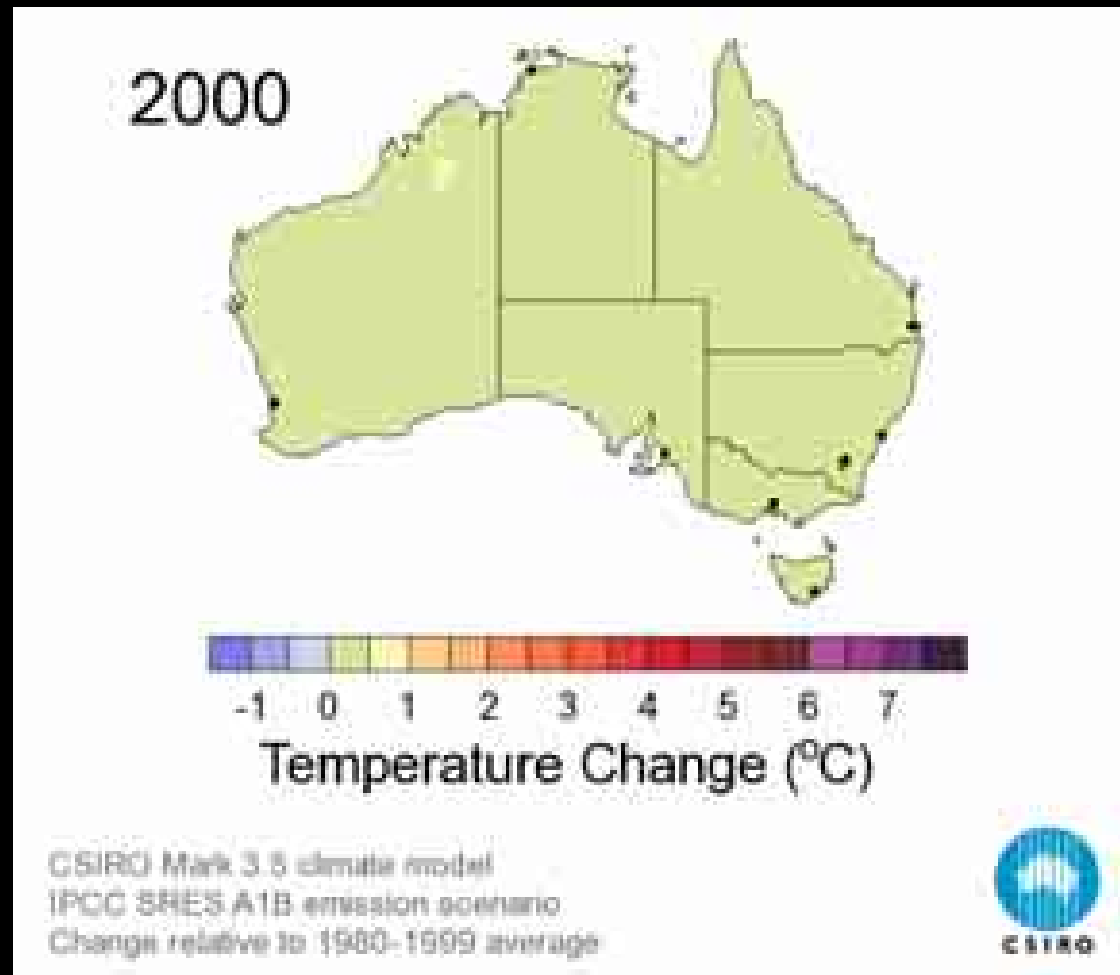


Source: Tree Hugger

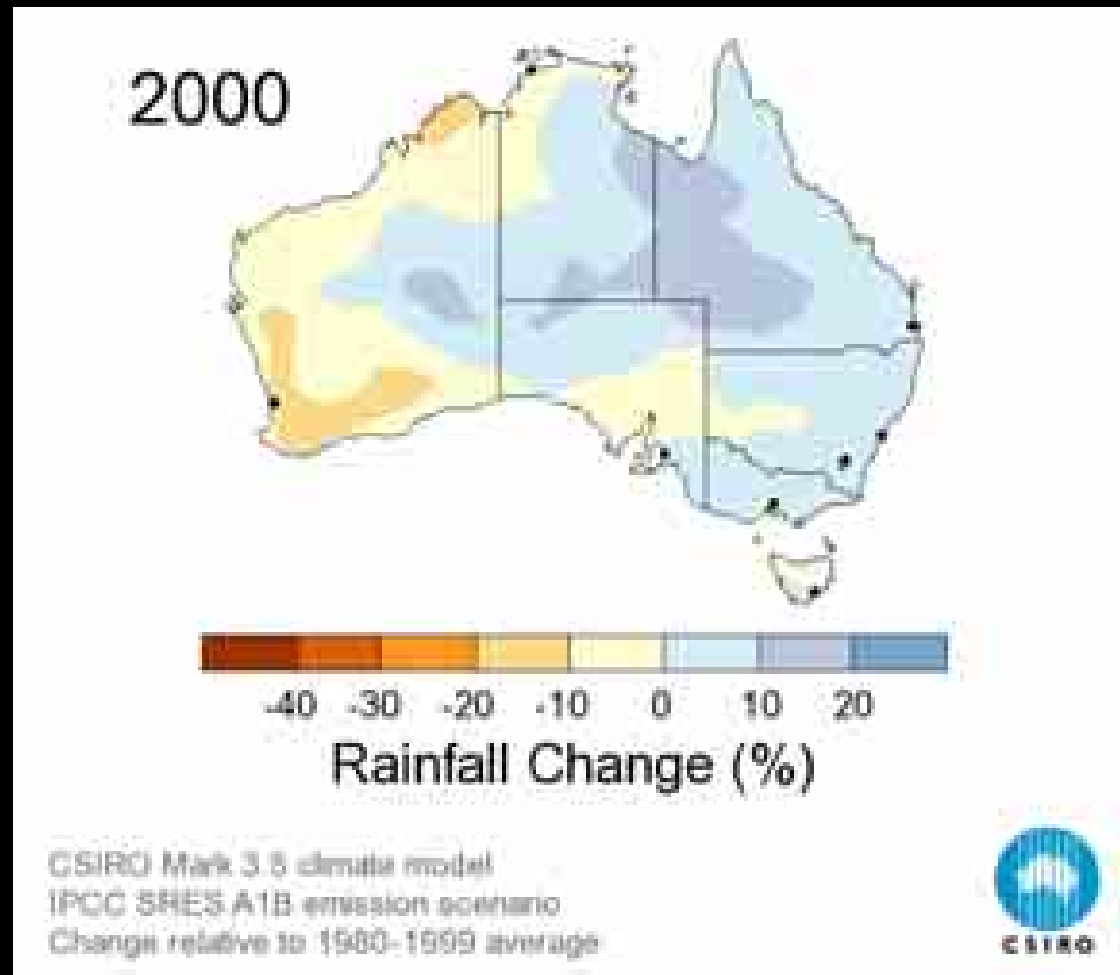
So much for what is already happening.
What is projected to happen in future?

- Impacts on global temperatures
- Impacts on rainfall
- Impacts on drought and fire
- Biodiversity impacts
- Sea level impacts

Projected Temperatures in Australia to 2100



Projected Rainfall in Australia to 2100



100% of Acacia Species in Southwest WA will become extinct with 1-2°C of warming





97% of the Great Barrier Reef will be bleached every year with 2-3°C of warming



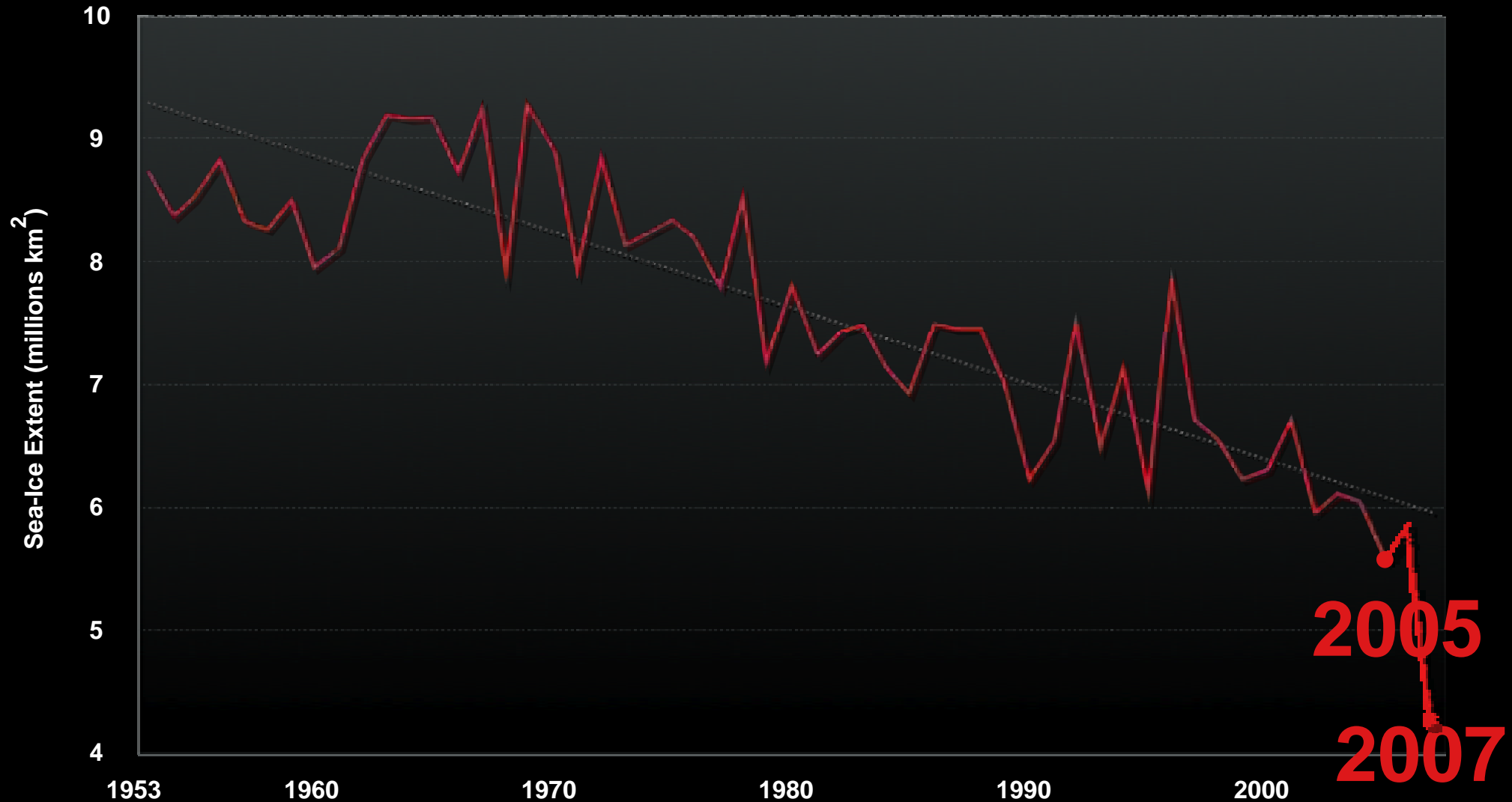
Photo: Ove Hoegh-Guldberg



Loss of Artic Sea Ice 1979-2007



Northern Hemisphere Sea Ice Extent







Mandurah Today






Mandurah with a 1m Sea Level Rise



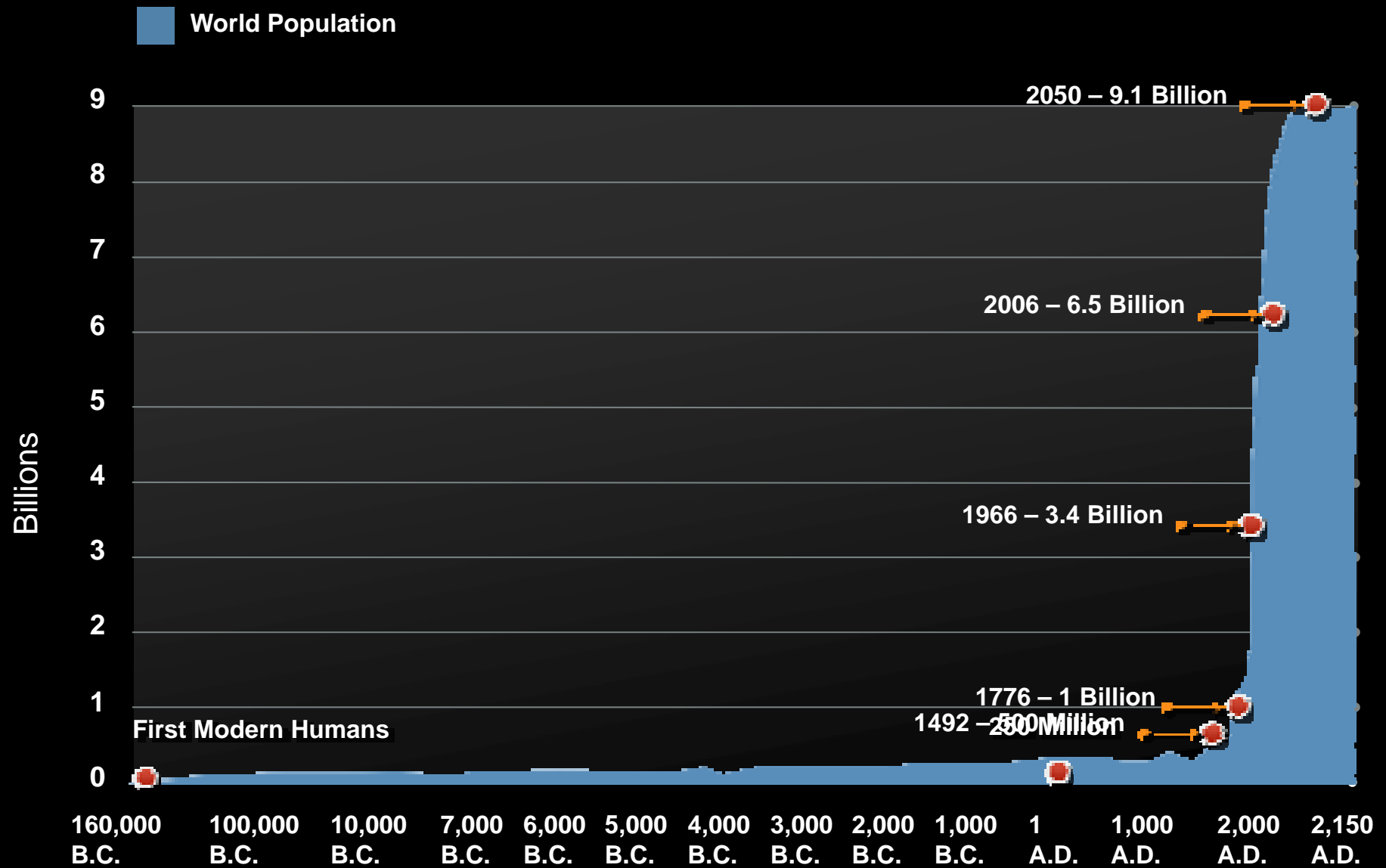
**We are witnessing a
collision between our
civilization and the earth**

**3 factors are
causing this collision:**

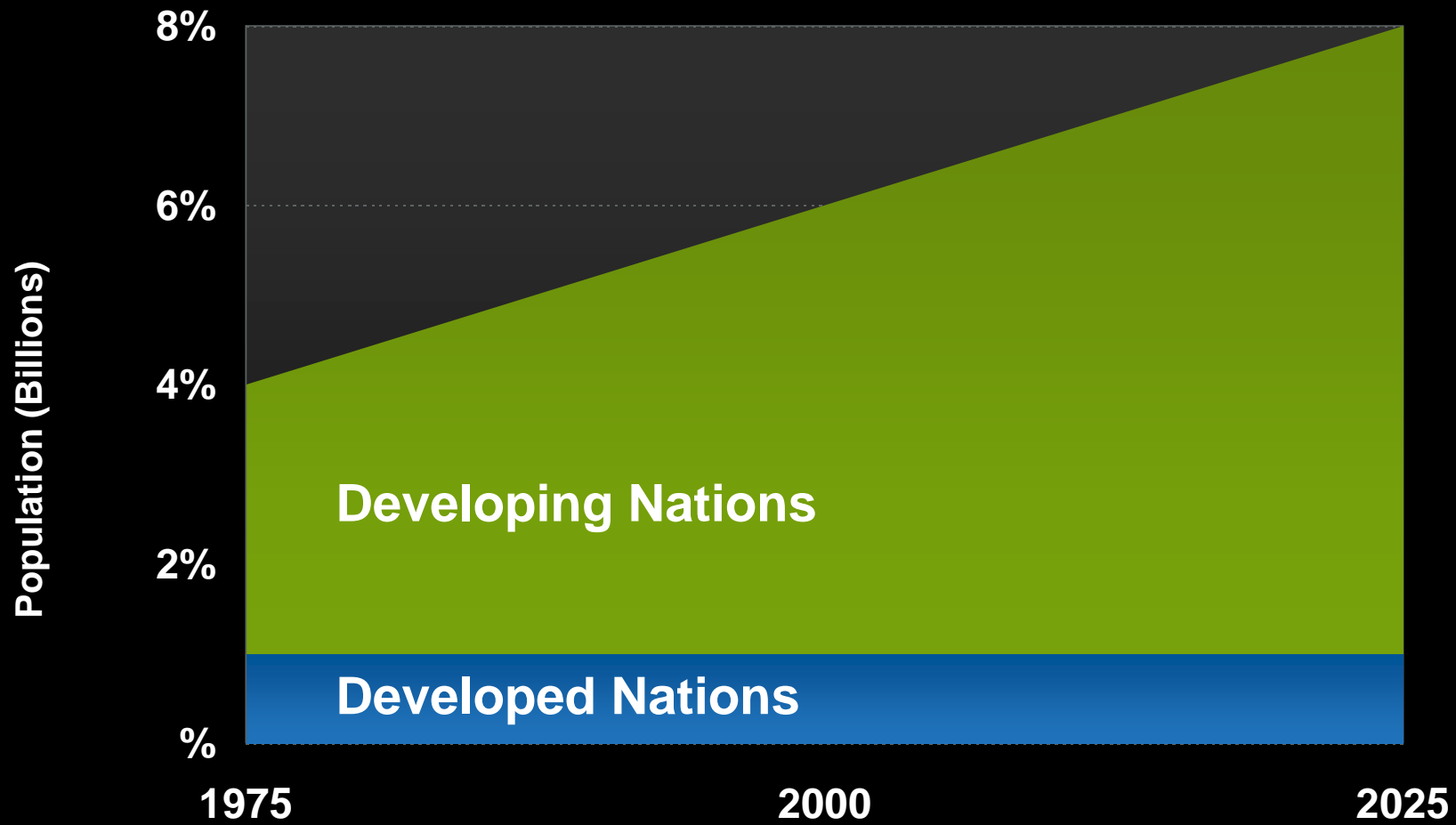
3 Factors

-  **The Population Explosion**
-  **The Scientific and Technological Revolution**
-  **Our Way of Thinking**

Population Growth Throughout History



Global Population






How sustainable is your lifestyle?



**The average Aussie needs 4
planet Earth's to be sustainable**

3 Factors

-  **The Population Explosion**
-  **The Scientific and Technological Revolution**
-  **Our Way of Thinking**

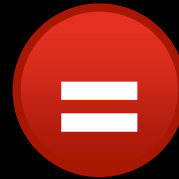




**Old
Habits**



**Old
Technology**



**Predictable
Consequences**

**Old
Habits**



**New
Technology**



**Dramatically
Altered
Consequences**






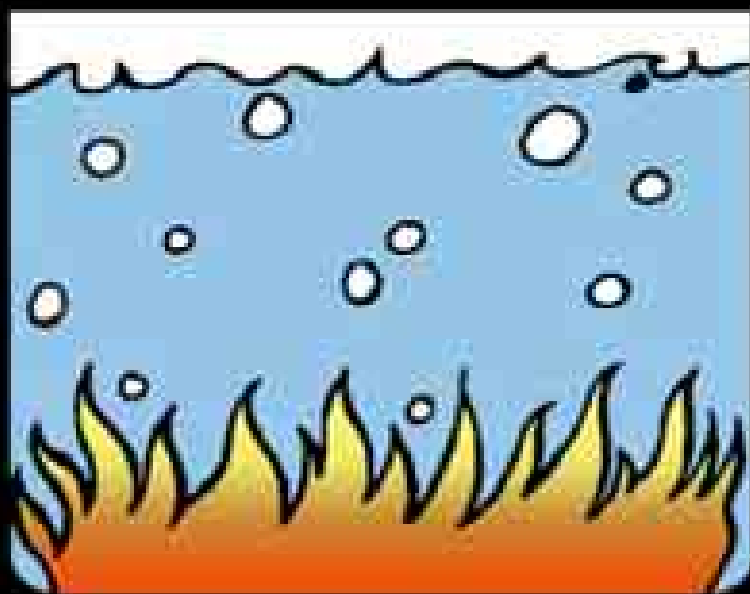


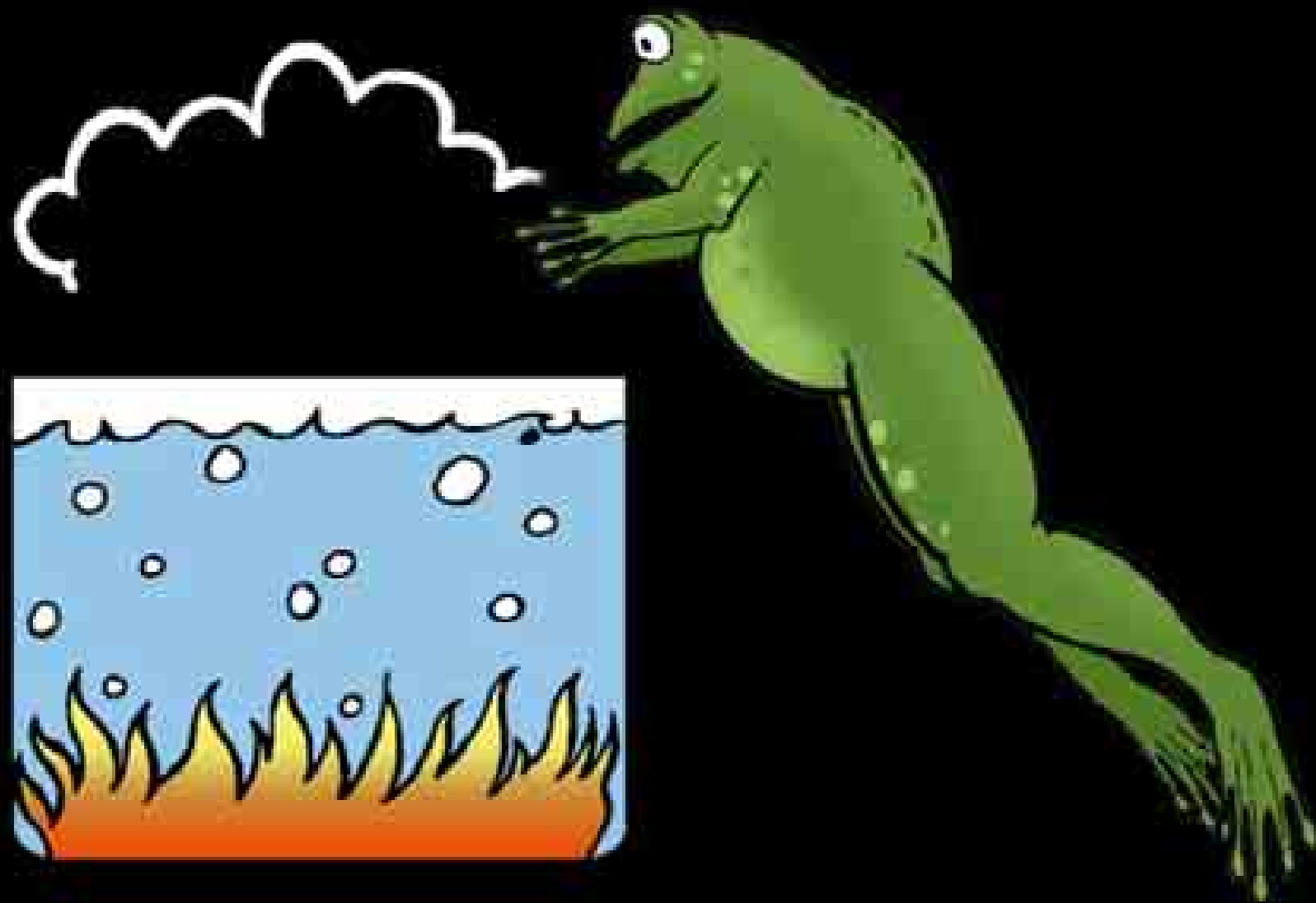




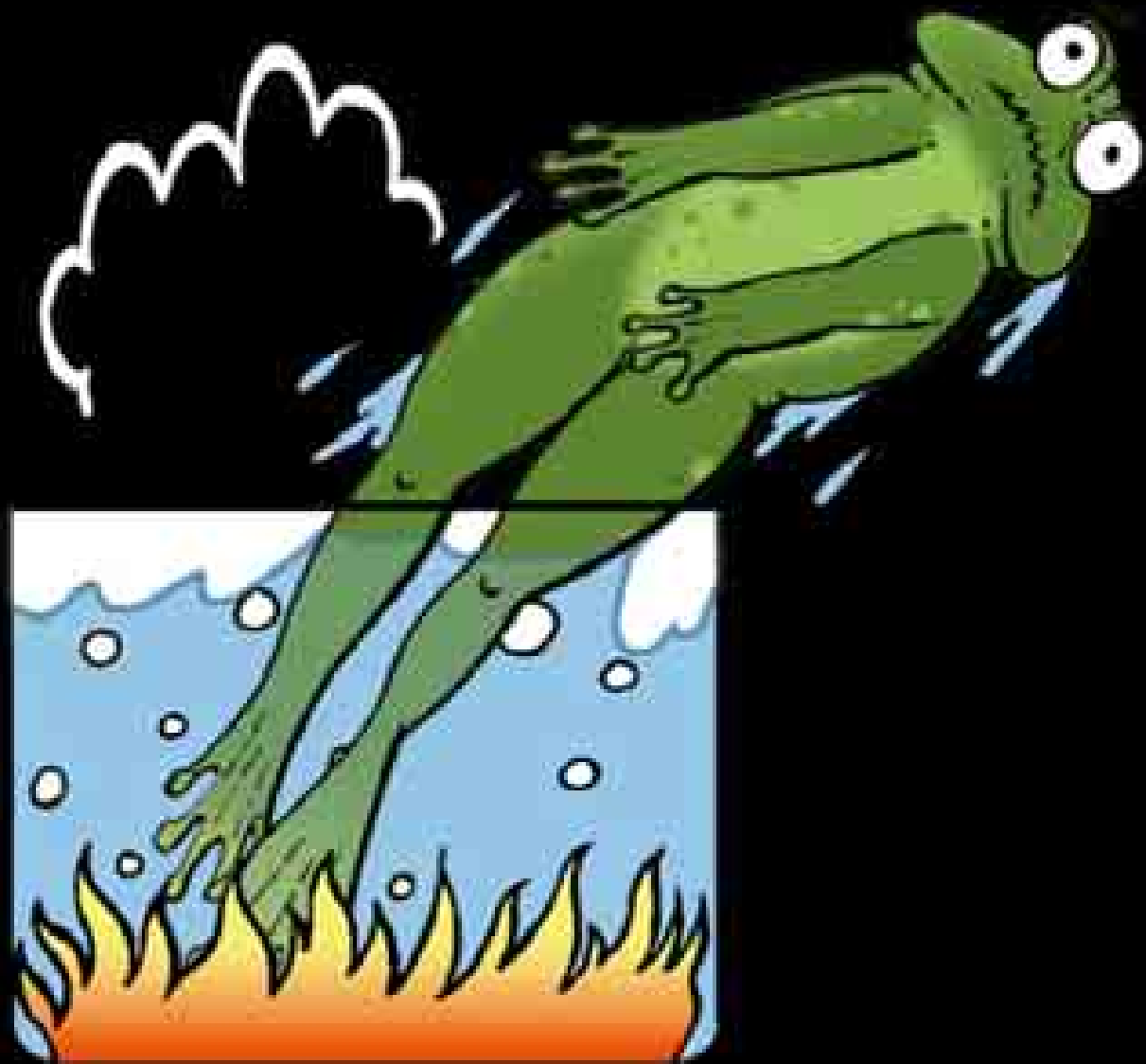
3 Factors

-  **The Population Explosion**
-  **The Scientific and Technological Revolution**
-  **Our Way of Thinking**













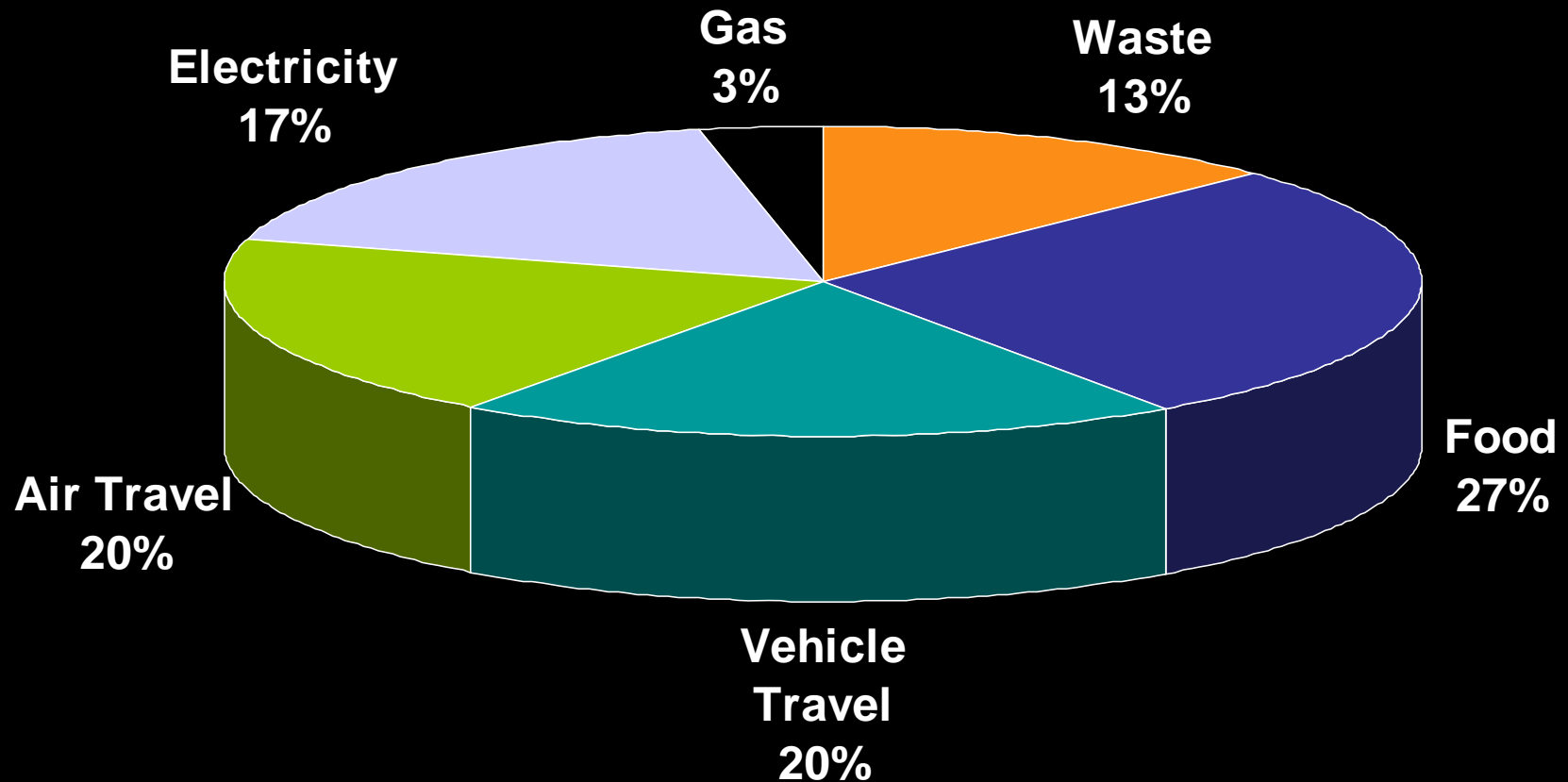








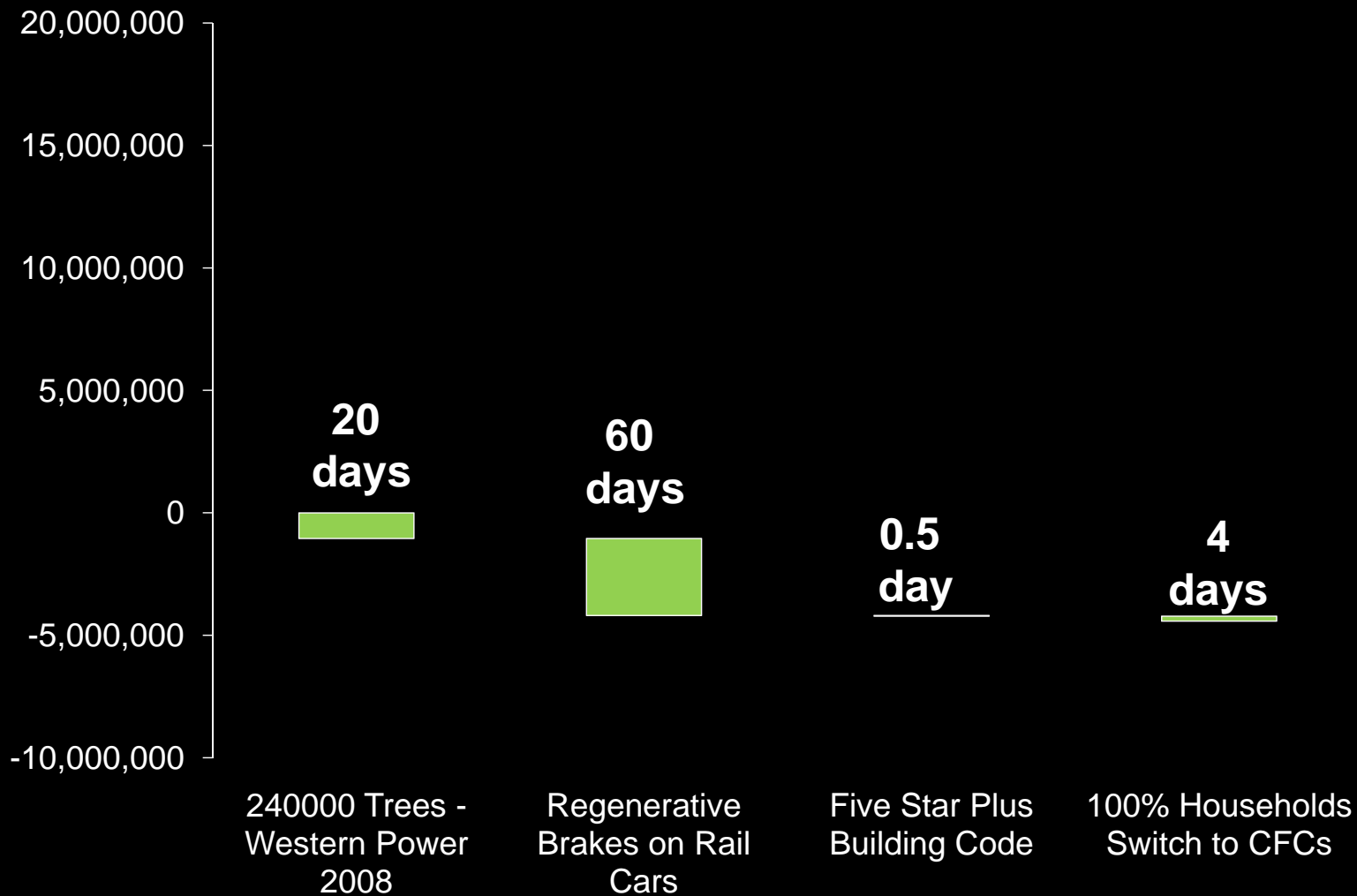
Source of Greenhouse Gas Emissions for a Typical Australian Household



Australia's climate change report card

Excellent	✓	Ratify Kyoto Protocol
	✓	Renewable target 20 per cent by 2020
Could Improve	?	Emissions trading scheme by 2010
	?	2020 emissions reduction target
	?	Energy efficiency - only modest measures planned
Fail	x	No commitment to stop Australia's emissions rising by 2010
	x	60 per cent reduction by 2050 is too small and not binding
	x	No plan to stop the construction of dirty coal fired power stations

Greenhouse impact of various initiatives



Examples of New Renewable Energy Technology – Solar Thermal Power



Examples of New Renewable Energy Technology – Wave Power



The world in front of us



