

Greenhouse Fact Sheet #2



Did you know?

Greenhouse Facts

Atmospheric trace gases that keep the earth warm are known as greenhouse gases. About three-quarters of the natural greenhouse effect is due to water vapour. The next most significant greenhouse gas is carbon dioxide.

Since the industrial revolution and expansion of agriculture around 200 years ago, we have been pumping additional carbon dioxide gas into the atmosphere. Today, the concentration of this gas is approximately 28 per cent greater than in the 18th century. Levels of other greenhouse gases have also increased because of human activities.

Higher concentrations of greenhouse gases in the earth's atmosphere will lead to increased trapping of infrared radiation. The lower atmosphere is likely to warm, changing weather and climate.

The changes will add to the natural greenhouse effect, producing an enhanced greenhouse effect. Possible impacts of the enhanced greenhouse effect on global and regional climate have been of increasing concern to scientists, the community and policy makers in recent years. (The enhanced greenhouse effect is often referred to as climate change or global warming.)

Greenhouse gases

The main greenhouse gases that are increasing in concentration due to human activities are carbon dioxide, methane, nitrous oxide, chlorofluorocarbons (CFCs), and ozone in the lower atmosphere.

Greenhouse gases differ in their contributions to global warming. For example, molecule for molecule, nitrous oxide and methane are more potent greenhouse gases than carbon dioxide.

	Carbon dioxide	Methane	Nitrous oxide	CFC-11
Concentration in 1994	~358 ppmv	~1720 ppbv	~312 ppbv	~268 pptv
Pre-industrial concentration (~1700s)	~280 ppmv	~700 ppbv	~275 ppbv	0
Annual rate of increase	0.4%	0.6%	0.25%	0*
Atmospheric lifetime	50-200 years	12 years	120 years	50 years

*Atmospheric concentrations of many ozone depleting substances are now declining

Data from *Intergovernmental Panel on Climate Change, 1995*; ppmv = parts per million by volume; ppbv = parts per billion by volume; pptv = parts per trillion by volume

Carbon dioxide (CO₂)

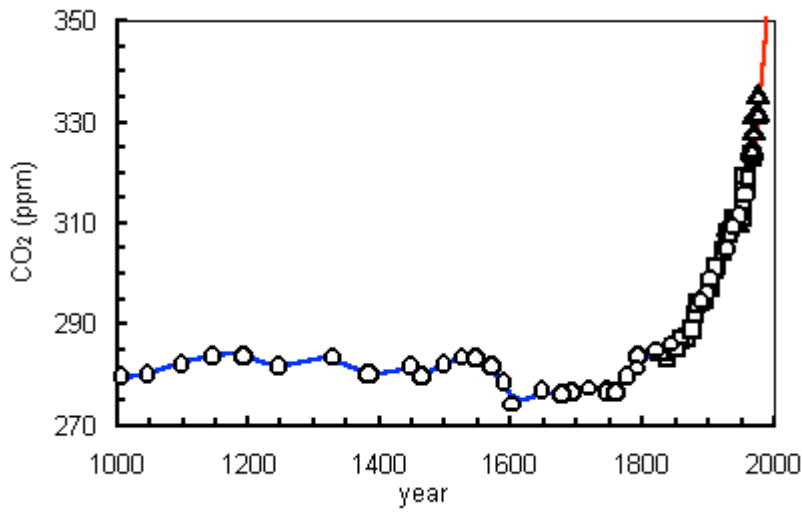
Most of the increase in carbon dioxide comes from burning of fossil fuels such as oil, coal and natural gas, and from deforestation. Globally, human activities are adding about 26 gigatonnes (26,000 million tonnes) of carbon dioxide into the atmosphere each year.

Fluctuating carbon dioxide concentrations in the atmosphere during the past thousand years, from measurements of air trapped in Antarctic ice (supplied by the Australian Antarctic Division) and, since the late 1970s, from analysis by the Cape Grim Baseline Air Pollution Station.

During pre-industrial times, carbon dioxide concentrations in air were about 280 parts per million (ppm) or 0.028 per cent. By 1994, the concentration was approximately 358 ppm.

Australian annual carbon dioxide production per person is about 14 tonnes. The average Australian car, for example, releases over 4 tonnes of carbon dioxide each year. In supplying energy to light a 100W

globe for eight hours, a fossil-fuel burning power station releases approximately 1 kilogram of carbon dioxide.



We can find out about the composition of air in the past by studying ice cores from Antarctica. As snow falls, it traps pockets of air. Eventually the snow turns to ice containing tiny air bubbles.

Analysis of these bubbles shows that there is a close relationship between carbon dioxide levels and world temperatures. The ice core record also shows that carbon dioxide concentrations are now higher than at any time in the past 160,000 years.