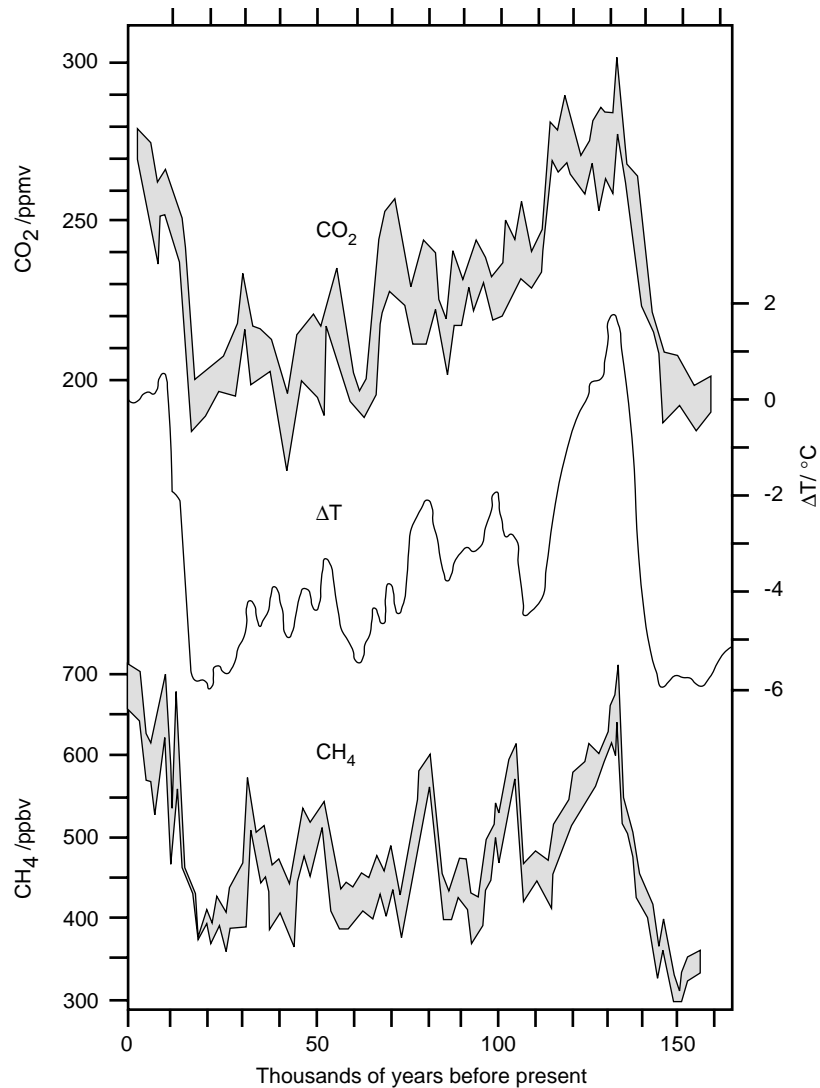


Other greenhouse gases

So far we have come to the conclusion that an increase in the levels of carbon dioxide in the atmosphere accompanies a rise in global temperature. We are now going to look at some data from other greenhouse gases to see if they have the same effect.

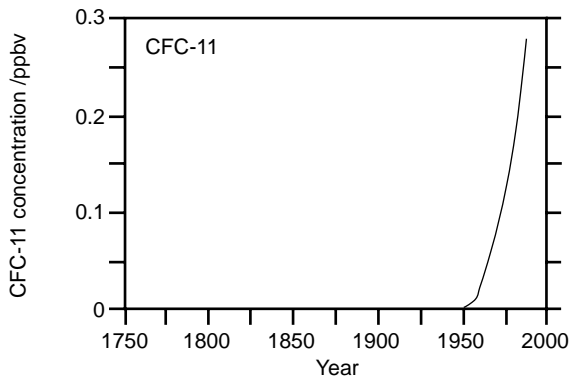
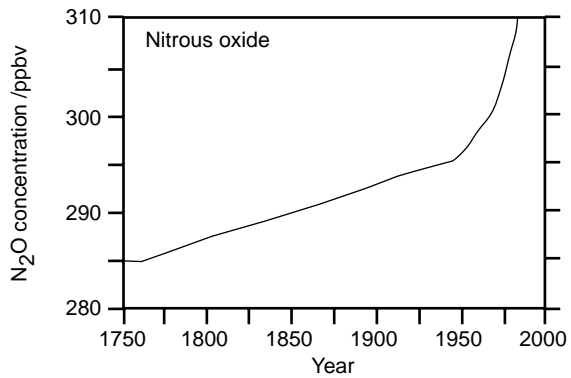
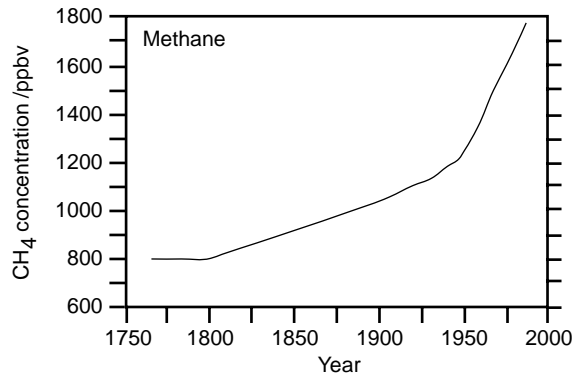


Graphs obtained from Antarctic ice core records of local atmospheric temperature and corresponding air concentrations of carbon dioxide and methane for the past 160,000 years

(Data source: Intergovernmental Panel on Climate Change.)

1. As the air temperature increases, what happens to the amount of methane in the atmosphere?
2. Using the data from the graph to support your answer, do you think the amount of methane in the atmosphere could lead to global warming?

The following graphs show estimated historical concentrations of major greenhouse gases, over the last 250 years.

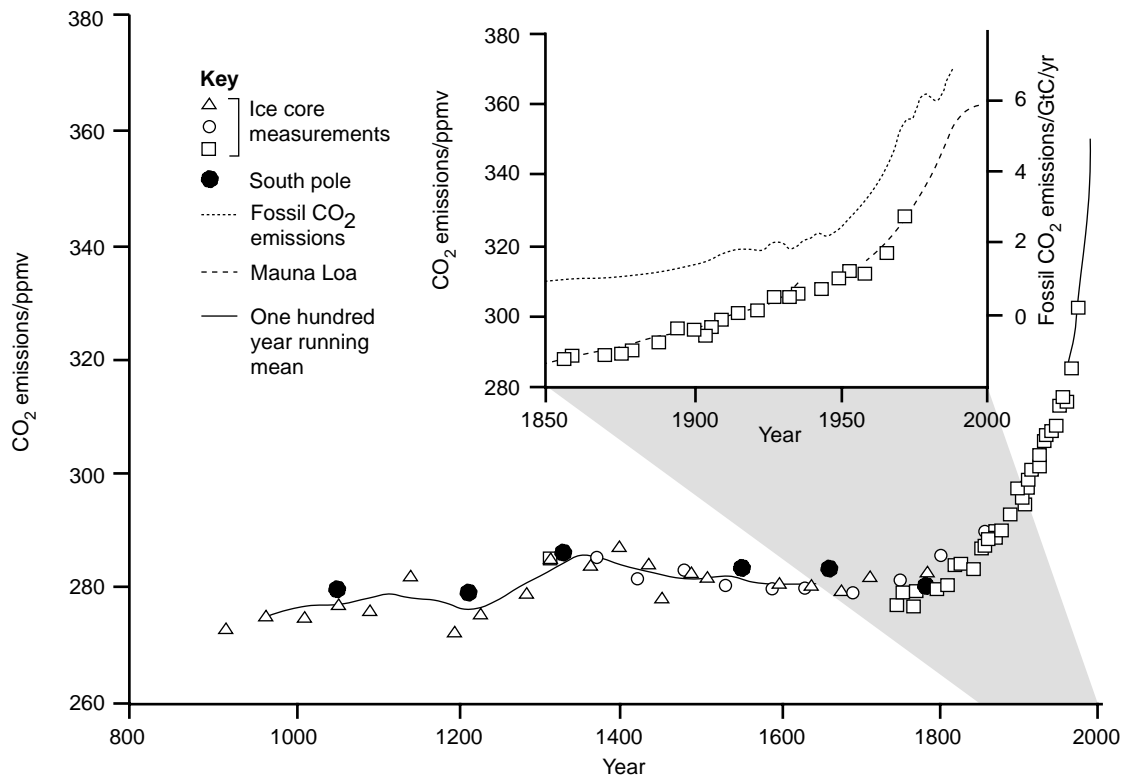


Graphs showing estimates historical concentrations of major greenhouse gases, over the last 250 years

(Data source: Intergovernmental Panel on Climate Change.)

3. In which year did the level of methane in the atmosphere first start to increase?
4. Describe what happened to the amount of methane in the atmosphere after 1950.
5. When did CFC-11 start to build up in the atmosphere?
6. The amount of nitrous oxide in the atmosphere has steadily increased during the last 250 years. When did the rate of increase suddenly change?
7. Do you think that any of the above gases could be linked to global warming? You must explain your answer.

The amounts of greenhouse gases in the atmosphere have increased dramatically over the last fifty years. This is mainly because of increased human population and activities, such as man-made chemicals and combustion.



Graphs showing carbon dioxide levels

(Data source: Intergovernmental Panel on Climate Change.)

The table below lists the main man-made sources of these gases. Greenhouse gases also occur naturally.

Greenhouse gas	Sources due to human activities
Carbon dioxide	Burning of fossil fuels Deforestation
Methane	Bacteria in rice paddy fields Released from natural gas and oil wells Landfill – (getting rid of waste) Domestic animals – mostly cattle Coal mining Biomass burning
Chlorofluorocarbons (CFCs)	Refrigerants Aerosols
Nitrous oxides	Fertilisers Combustion of fuels in cars and power stations Biomass burning.

Sources of greenhouse gases

One of the big problems with greenhouse gases is that once they enter the atmosphere, it is a long time before they leave. The table below shows how long each molecule of gas will stay in the atmosphere.

	Carbon dioxide	Methane	CFC-11	Nitrous oxide
Atmospheric lifetime (years)	50–200	10	65	150

Atmospheric lifetime of greenhouse gases

8. Which greenhouse gas stays in the atmosphere for the shortest length of time?
9. Which greenhouse gas is the hardest to get rid of?
10. You work for the local council and have been invited to give a speech on global warming and the greenhouse effect. Members of the audience will be local residents and business people. Prepare notes for the speech.

Your speech should include the following points;

- What the greenhouse effect is;
- The likely causes of recent global warming (over the last fifty years);
- Your plans to help reduce global warming by local actions;
- The problems you expect to find when carrying out these plans; and
- The time-scale needed to carry out these plans.

You may like to include a visual aid to use during your speech.