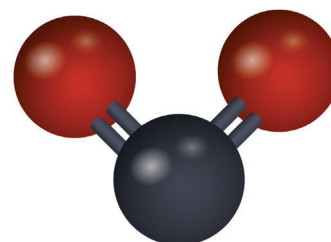


What is CO₂?

.... and why we need to limit it.

All life on earth - plant, animal and human - is based on three elements, carbon, hydrogen and oxygen (chemical symbols C, H and O). These elements are combined (with other trace elements) in all life forms, and in the foods we eat (known as carbohydrates) and the fuels we burn (known as hydrocarbons).

When we burn fuels such as coal, oil, natural gas or wood to produce energy, the carbon atoms combine with oxygen to make the gas CO₂, carbon dioxide, which consists of one atom of carbon bonded to two of oxygen. We also produce CO₂ in our bodies when we digest and metabolise the carbohydrates in our food, combining the carbon with the oxygen we breathe in to make energy, and breathing out CO₂.



CO₂ molecule: one part carbon
two parts oxygen

A Natural Balance Lost

While animals breathe in oxygen and breathe out CO₂, plants do the reverse - absorbing CO₂ from the atmosphere and combining it with water (H₂O) to make plant material (carbohydrates), and releasing oxygen back into the air through photosynthesis.

For millions of years these processes balanced each other out, keeping the amount of CO₂ in the atmosphere fairly stable at between 200 and 300 parts per million (ppm).

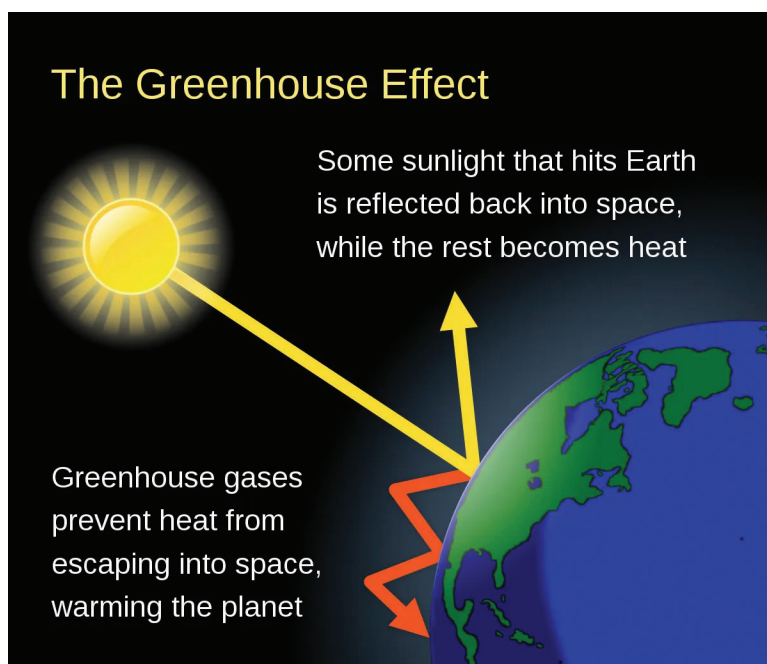
However, since the start of the industrial revolution, around 250 years ago, we have been burning ever-increasing amounts of hydrocarbons, so CO₂ levels have now gone up to over 420 ppm and are still rising.

The Global Greenhouse

In the upper atmosphere, CO₂ acts like the glass in a greenhouse, trapping the sun's heat. The more CO₂ there is, the more heat is trapped. This is the process of Global Warming, which causes Climate Change.

A number of other gases contribute to this greenhouse effect, but CO₂ is the most important.

At pre-industrial levels, CO₂ kept the earth warm enough for life. Now, if we fail to stop global warming, the whole planet will continue heating up until it becomes uninhabitable.



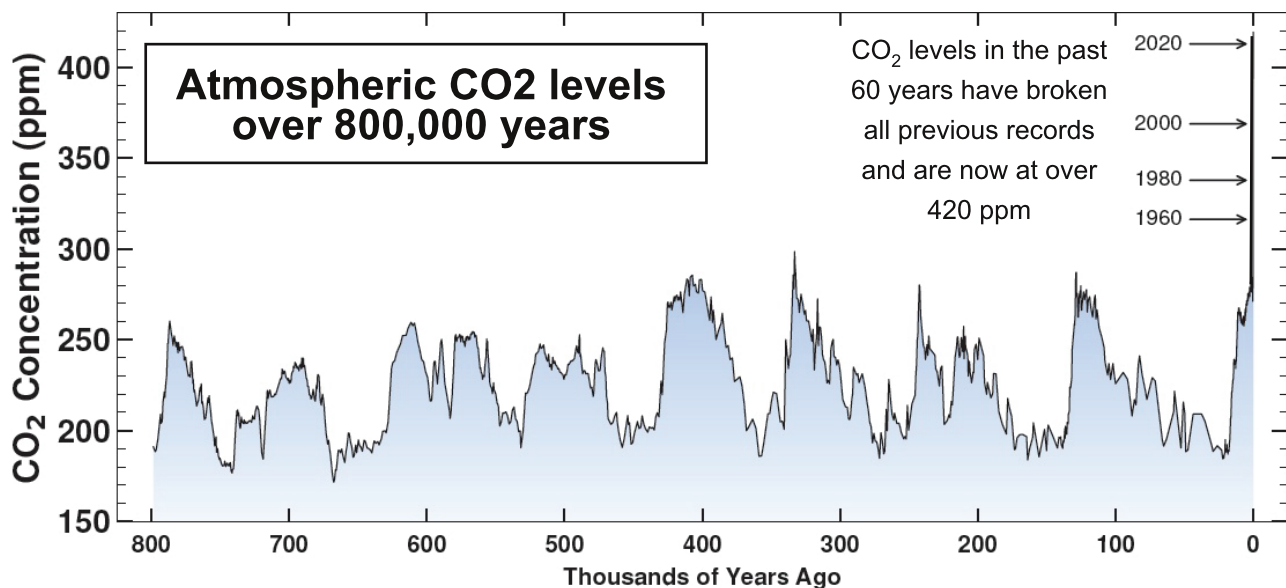
We must cut our carbon dioxide emissions before it is too late. And time is running out fast.

CO₂ in the Earth's Atmosphere

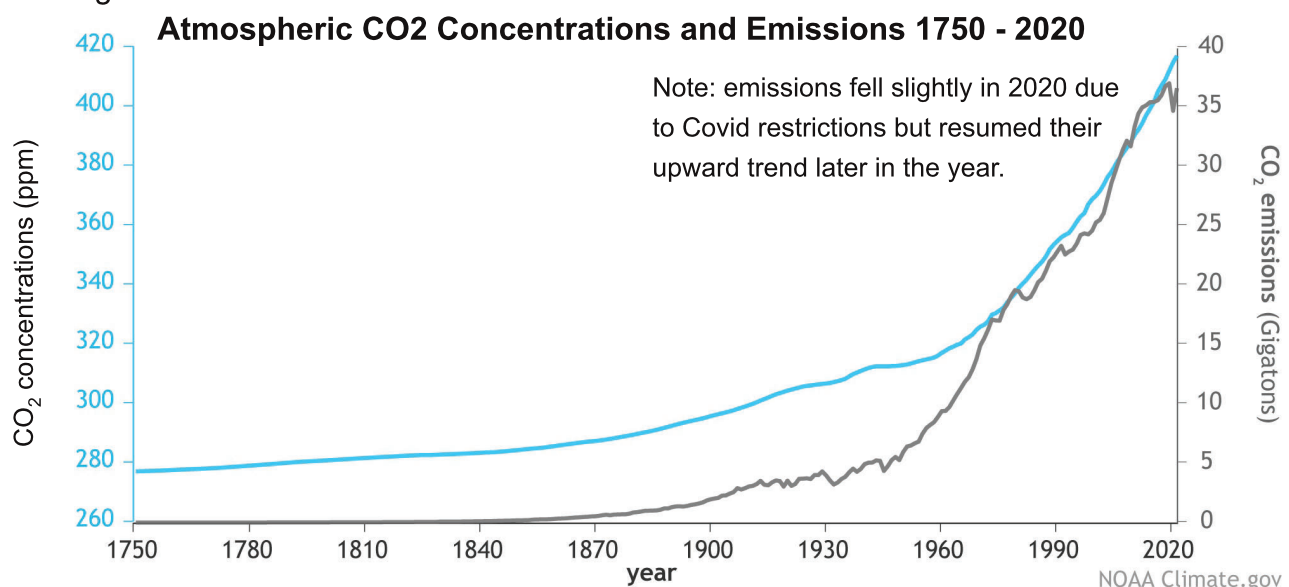
If there were no CO₂ or other Greenhouse Gases in the Earth's atmosphere, our planet would be a very cold place indeed. Most of the heat from the sun would escape back into space, and the average surface temperature would be around -18°C. The Earth would be a ball of ice, and complicated lifeforms could not have evolved.

Too much CO₂ and other Greenhouse Gases in the atmosphere means that less of the sun's heat is escaping, so the Earth is heating up. If we cannot stop those levels from increasing it will continue getting hotter until it becomes impossible for humans and other advanced lifeforms to survive.

By analysing prehistoric air trapped in ancient ice deep in the polar icesheets, scientists know that atmospheric CO₂ levels have been between 200 and 300 parts per million (ppm) for the past 800,000 years. Warmer periods and ice ages have come and gone as those levels have gone up and down, but they have remained within those limits which have allowed life to survive and evolve.



Since the start of the industrial revolution, CO₂ levels have risen due to the burning of fossil fuels. They have gone up by over 50% since 1750, to levels never seen before in the whole of human history. That is what has led to the present climate crisis, but those levels, and the level of emissions, are still rising.



If we are to limit climate change to the UN target of 1.5°C, we need to cut CO₂ emissions by 45% by 2030, and to net zero by 2050. If we fail to achieve this, climate change will certainly get worse, and is likely to spiral out of control, putting all life on Earth in serious peril.