



What is the greenhouse effect?

There has always been a natural greenhouse effect, which keeps the Earth warmer than it would be without an atmosphere, making life on Earth possible.

Energy from the sun reaches the Earth and warms it. The Earth reflects this energy back, at the same time changing it to infrared energy (heat). Due to gases in the atmosphere that envelops the Earth like a blanket, part of this reflected energy is trapped and never leaves the Earth. Thus, in contrast to other planets without an atmosphere, the Earth stays warm.

Before the Industrial Revolution, which started in the middle of the 18th century, economies were mostly based on small-scale agriculture and commerce. Since then, advances in technology, the large-scale construction of factories, a colossal growth in manufacturing and the advent of large-scale mechanised agriculture have led to increased pollution and the production of greenhouse gases such as carbon dioxide, nitrogen oxides, Freon and methane, as well as water vapour.

The increased concentration of greenhouse gases has led to an increase in the amount of trapped solar energy, thereby raising the temperature of the Earth's atmosphere. The latest scientific insights and research confirm that global climate change is taking place, and it is projected to continue.

Most greenhouse gases, such as carbon dioxide, nitrogen oxides and methane, occur naturally.



Methane

Emitted during the production and transport of coal, natural gas and oil, methane is also produced by livestock farming and the decomposition of organic waste in municipal solid waste landfills. Methane is 20 times more effective in trapping heat than carbon dioxide and thus contributes 20 times more to the greenhouse effect.





Carbon dioxide

Over millions of years, trillions of tonnes of carbon were removed from the atmosphere by plants and trapped in sediments that eventually became deposits of coal, oil and natural gas. For the past two centuries, humans have been extracting and igniting these fossil fuel resources at an increasing rate. Today, human beings release about 5.5 billion tonnes of carbon into the atmosphere every year by burning fossil fuels. Another 1.5 billion tonnes per year are released through land-use changes, such as deforestation. When trees are cut, they stop absorbing carbon. If the trees are then burned, the carbon is immediately released back into the atmosphere. These releases result in an increase in atmospheric carbon dioxide of about 0.5 percent per year. Since the Industrial Revolution, the concentration of atmospheric carbon dioxide has increased by 30 percent. The use of fossil fuels for energy production and transport is the leading source of global carbon dioxide emissions.



Nitrogen oxides

Emissions of these gases are caused mainly by agricultural activities and the burning of vegetation and forests.

