- Greenhouse effect



Overview: 5 top worst greenhouse gases

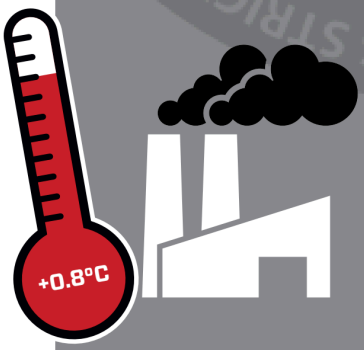
When people talk about global warming, it's almost always CO_2 emissions which get the focus. But several other greenhouse gases are just as important to control if we are to curb rising temperatures. Read about the worst substances – and their climate impacts – here.

SHUTTERSTOCK

How scientists compare greenhouse gases

To compare the climate impact of different gases, researchers use GWP (Global Warming Potential), which is a measure of how much global warming a specific quantity of a greenhouse gas causes compared with the same quantity of CO_2 over a period of 100 years.

CO_2 FOSSIL FUELS SHIFT THE CARBON BALANCE

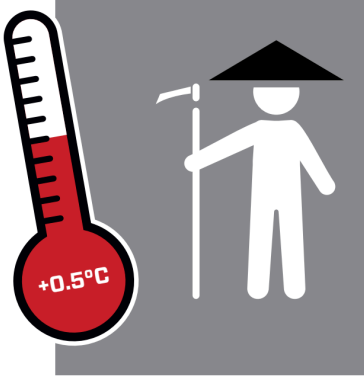


Carbon dioxide, CO_2 is the most important human-induced greenhouse gas; it is also emitted naturally by volcanoes, wildfires, and when animals and humans breathe. The problem arises when we extract fossil carbon from the ground in the shape of oil, gas and coal and then burn it. This adds large quantities of CO_2 to the atmosphere. Since the dawn of industrialisation 150 years ago, our burning of fossil fuels has increased CO_2 content in the atmosphere by 50%.

GWP: 1

- **CONCENTRATION:** 421 out of a million molecules.
- **LIFE SPAN:** Up to 1000 years.
- **WARMING POTENTIAL IN 100 YEARS:** 1 GWP.
- **CURRENT WARMING EFFECT:** 0.8°C.

METHANE WET FIELDS WARM THE PLANET



Like CO_2, methane (CH_4) is a natural part of Earth's carbon cycle, but human activities, including agriculture, have significantly increased the quantity. Rice is grown in irrigated fields that emit methane. So does our use of fossil fuels: when we extract natural gas from the ground, refine it and transport it, large quantities of methane are released into the atmosphere. Overall, methane emissions are responsible for 30% of global warming since pre-industrial times.

GWP: 28

- **CONCENTRATION:** 1.9 out of a million molecules.
- **LIFE SPAN:** 12 years.
- **WARMING POTENTIAL IN 100 YEARS:** 28 GWP.
- **CURRENT WARMING EFFECT:** 0.5°C.

COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED COPY NOT TO BE DISTRIBUTED PRINTED FROM PRESSREADER

By **Jens E. Matthiesen**

NITROUS OXIDE

LAUGHING GAS IS NO JOKE FOR THE CLIMATE



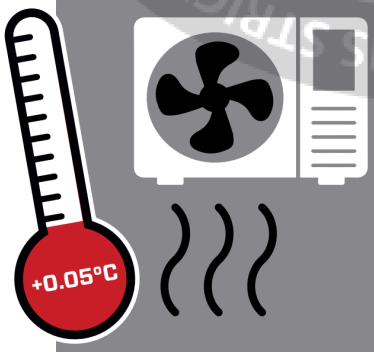
Nitrous oxide (chemical formula N_2O) is best known as the laughing gas used by dentists. But by far the largest release of this potent greenhouse gas comes from fertilisers in agriculture. Nitrous oxide also has a long life span in the atmosphere. Although our emissions have increased significantly in recent decades, it has not received much attention, which is why some scientists call nitrous oxide the "forgotten greenhouse gas".

GWP: 265

- **CONCENTRATION:** 0.3 out of a million molecules.
- **LIFE SPAN:** 121 years.
- **WARMING POTENTIAL IN 100 YEARS:** 265 GWP.
- **CURRENT WARMING EFFECT:** 0.1°C.

HFC GASES

HUMAN-MADE GASES ARE EXTREMELY POTENT



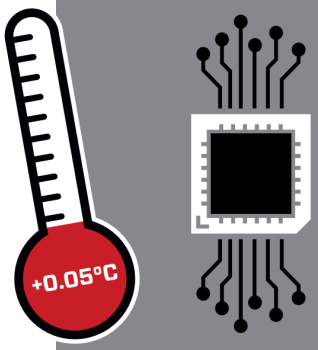
Hydrofluorocarbons (HFCs) are human-made gases that contain hydrogen (H), fluorine (F), and carbon (C). They are often used in air conditioning systems and heat pumps, where our use of HFC gases has increased dramatically since CFC gases were phased out due to their destructive effect on the ozone layer. HFC gases are less harmful to ozone, but are much more potent greenhouse gases: CHF_3 is 12,400 times more potent than CO_2. HFCs are now included in climate negotiations and are targeted for reduction.

GWP: 1300

- **CONCENTRATION:** 0.0001 out of a million molecules.
- **LIFE SPAN:** 13 years (some 200+ years).
- **WARMING POTENTIAL IN 100 YEARS:** 1300 GWP.
- **CURRENT WARMING EFFECT:** 0.05°C.

PFC GASES

SIMPLE GASES LAST ALMOST FOREVER



Perfluorocarbons (PFCs) consist entirely of the elements fluorine (F) and carbon (C). They are used in the electronics industry to etch microchips, but the largest emissions come from the production of aluminium, when the metal is extracted from bauxite. PFC gases have a very long life span in the atmosphere – the most common and simplest, tetrafluoromethane with the formula CF_4, takes 50,000 years to break down. PFCs have been targeted for controls by the UN and some Clean Air legislation.

GWP: 6630

- **CONCENTRATION:** 0.0001 out of a million molecules.
- **LIFE SPAN:** 50,000 years (some only 10,000 years).
- **WARMING POTENTIAL IN 100 YEARS:** 6630 GWP.
- **CURRENT WARMING EFFECT:** 0.05°C.

COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED • PRINTED FROM PRESSREADER • NOT FOR RESALE • PERSONAL COPY