

# What is global warming?

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Soon, the world will gather in Paris to forge a global pact to reduce greenhouse gas emissions blamed for dangerous levels of global warming.

Here is why Earth is getting hotter:

## Greenhouse effect

The so-called "greenhouse effect" is a natural phenomenon that has made Earth warm enough for humans to survive on it comfortably.

An invisible blanket of nitrogen, oxygen and small amounts of carbon dioxide (CO<sub>2</sub>) and other gases, envelops our planet, allowing it to retain the sun's heat.

However, human activities such as burning coal and oil inject additional CO<sub>2</sub> into the atmosphere, which acts as an extra blanket to trap more—in fact too much—solar radiation.

## Pollution sources

Humanity's annual output of [greenhouse gases](#) is higher than ever, totalling the equivalent of just under 53 billion tonnes of CO<sub>2</sub> in 2014, according to the UN.

And the rate of increase is accelerating. It jumped 2.2 percent per year during the 2000s, compared to 1.3 percent per year from 1970-2000.

Energy production is the single biggest source of greenhouse gases at 35 percent of the total. Agriculture and deforestation come in second at 24 percent.

Heavy industry is next at 21 percent, followed by transportation with 14 percent. Buildings contribute six percent of total [emissions](#).

## Already in the air

The average concentration of greenhouse gases in the atmosphere was

430 particles per million (ppm) of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) in 2011—a level not seen on Earth for more than 800,000 years.

To stand a two-in-three chance at limiting [global warming](#) to two degrees Celsius (3.6 degrees Fahrenheit) over pre-Industrial Revolution levels—the United Nations target—the level must not exceed 450 ppm of CO<sub>2</sub>e by century's end.

## **Warmer planet**

Earth's average temperature has already climbed about 1.0 C from 1880 to 2015—halfway to the 2 C target. But the increase has not been evenly distributed, with higher temperatures detected over land than the ocean, and increases have been particularly intense at the north and south poles.

The last three decades have been the hottest recorded on the planet since 1850. The surface temperature of oceans climbed 0.11 C per decade between 1971 and 2010.

## **Highest emissions**

The UN's climate science body has predicted that without reducing emissions, global temperatures would likely rise by 3.7-4.8 C by 2100.

Humanity can emit no more than one trillion tonnes of CO<sub>2</sub> in total, on top of the 1.9 trillion tonnes already emitted.

To stay under the 2 C ceiling, [greenhouse gas emissions](#) must be cut by 40-70 percent over 2010 levels by 2050, and eliminated entirely by century's end.

Cutting emissions requires investments of hundreds of billions of dollars

per year between now and 2030.

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