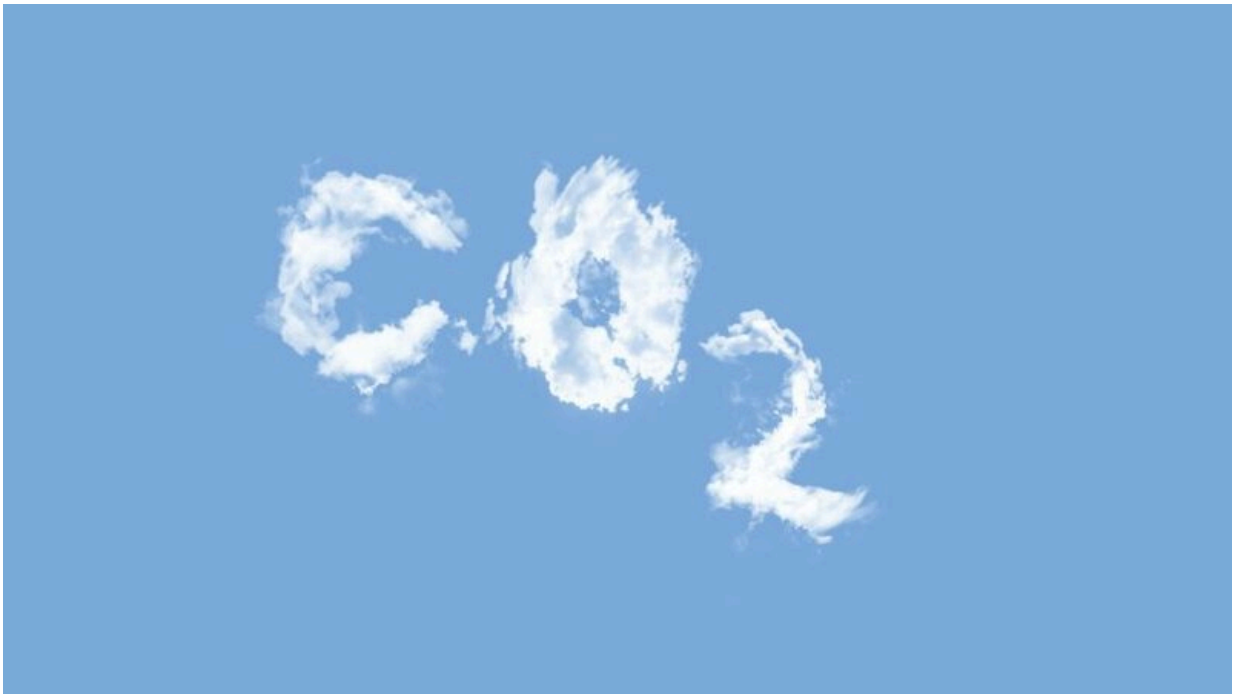


Carbon dioxide up at rates 'incompatible' with 1.5°C target, study warns

January 18 2025



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Carbon dioxide in the atmosphere is increasing at rates that are incompatible with staying below 1.5 degrees Celsius (2.7 degrees Fahrenheit) of global warming, a Met Office study warns.

Concentrations of the key greenhouse gas rose at their fastest annual levels in 2024 in the long-running record of measurements taken at

Mauna Loa, Hawaii, stretching back to 1958, and exceeding Met Office predictions for the year.

The rise of 3.58 parts per million (ppm) recorded at Mauna Loa was above the predicted 2.84ppm from Britain's Met Office, while satellite measurements also showed large rises worldwide.

The Met Office said the increase was due to record high emissions from fossil fuel burning, natural "sinks" such as [tropical forests](#) capturing less carbon, and wildfires.

The reduction in carbon absorbed by forests and the wildfires were driven by hot conditions linked to the El Niño weather pattern in the Pacific, which pushes up global temperatures, and climate change.

The Met Office, which has produced forecasts for [carbon dioxide](#) since 2016, predicts rises between 2024 and 2025 will be less extreme than last year, at around 2.26ppm.

But even this slower rise will be too fast to stay on track for pathways laid out by the U.N.'s climate body, the Intergovernmental Panel on Climate Change (IPCC) that see temperatures remain below 1.5 degrees Celsius of warming from preindustrial levels with no or little overshoot, the Met Office warned.

The IPCC also has pathways that see temperatures overshooting 1.5 degrees Celsius temporarily for a few decades before returning below the threshold by the end of this century.

But they will require greater reliance on technologies or approaches, such as planting more forests that reduce the overall level of carbon dioxide in the atmosphere.

Pursuing efforts to prevent the world warming more than 1.5 degrees Celsius above preindustrial temperatures is one of the key commitments of the global Paris treaty that countries agreed to in 2015, in a bid to avert the most dangerous impacts of climate change.

Carbon dioxide in the atmosphere traps heat, and higher levels of the gas trap more heat, pushing up global temperatures over time, which causes worsening impacts including sea level rises, more extreme droughts, storms, floods and harm to wildlife and critical natural systems.

If global warming is to be limited to 1.5 degrees Celsius, the increase in carbon dioxide in the atmosphere needs to already be slowing to a rise of 1.8ppm per year this decade, before halting and starting to decline, according to IPCC calculations, the Met Office said.

But increases are averaging around 2.5ppm so far this decade, the Met Office's Professor Richard Betts, who leads the production of the forecast, said.

"Last week, it was confirmed that 2024 was the [warmest year](#) on record, with annual average temperatures higher than 1.5 degrees Celsius above preindustrial levels for the first time," he said.

"While this does not represent a failure to achieve the Paris Agreement target, as that would require breaching warming 1.5 degrees Celsius over a longer period and we may see a slightly cooler year in 2025, the long-term warming trend will continue because carbon dioxide is still building up in the atmosphere."

He said that a switch from El Niño to its opposite, La Niña—which creates cooler, wetter conditions, particularly in the tropics—would mean forests and other natural systems soak up more carbon than last year, temporarily slowing the rise in levels of carbon dioxide in the

atmosphere.

"However, stopping global warming needs the buildup of greenhouse gases in the air to come to a complete halt and then start to reduce.

"Large, rapid emissions cuts could limit the extent to which [global warming](#) exceeds 1.5 degrees Celsius—but this needs urgent action internationally," he said.

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Citation: Carbon dioxide up at rates 'incompatible' with 1.5°C target, study warns (2025, January 18) retrieved 30 January 2025 from <https://phys.org/news/2025-01-carbon-dioxide-incompatible-15c.html>

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