

Global carbon dioxide emissions projected to rise after three stable years

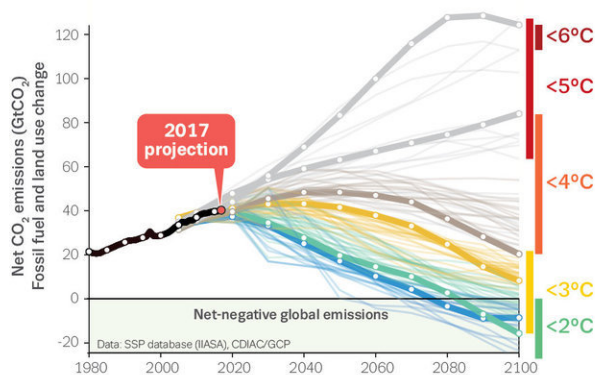
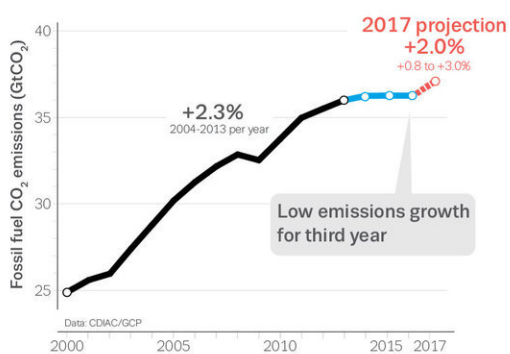
November 13 2017

Global Carbon Budget 2017

In 2017, CO₂ emissions from fossil fuels and industry are projected to **grow by 2.0%** (+0.8 to +3.0%). This follows three years of nearly **no growth (2014-2016)**

In 2016 atmospheric CO₂ levels reached **403 ppm**...
...and are projected to increase by 2.5 ppm in 2017 (+2.0 to +3.0ppm)
315 ppm
Data: Scripps/NOAA-ESRL
1960 2016

The **plateau** of last year was not peak emissions after all...



Key data from the 2017 global carbon budget. Credit: Future Earth/Global Carbon Project

By the end of 2017, global emissions of carbon dioxide from fossil fuels and industry are projected to rise by about 2% compared with the preceding year, with an uncertainty range between 0.8% and 3%. The news follows three years of emissions staying relatively flat.

That's the conclusion of the 2017 Global Carbon Budget, published 13 November by the Global Carbon Project (GCP) in the journals *Nature Climate Change*, *Environmental Research Letters* and *Earth System Science Data Discussions*.

The announcement comes as nations meet in Bonn, Germany, for the annual United Nations climate negotiations (COP23).

Lead researcher Prof Corinne Le Quéré, director of the Tyndall Centre for Climate Change Research at the University of East Anglia, said: "Global [carbon dioxide emissions](#) appear to be going up strongly once again after a three-year stable period. This is very disappointing."

"With [global carbon](#) dioxide emissions from all human activities estimated at 41 billion tonnes for 2017, time is running out on our ability to keep warming well below 2 °C let alone 1.5 °C."

"This year we have seen how climate change can amplify the impacts of hurricanes with stronger downpours of rain, higher sea levels and warmer ocean conditions favouring more powerful storms. This is a window into the future. We need to reach a peak in [global emissions](#) in the next few years and drive emissions down rapidly afterwards to address [climate change](#) and limit its impacts."

China's emissions account for 28% of global emissions. Budget co-author Glen Peters, research director at CICERO in Oslo, who led one of the studies, said: "The return to growth in global emissions in 2017 is largely due to a return to growth in Chinese emissions, projected to grow by 3.5% in 2017 after two years with declining emissions. The use of coal, the main fuel source in China, may rise by 3% due to stronger growth in industrial production and lower hydro-power generation due to less rainfall."

"Several factors point to a continued rise in 2018," said Robert Jackson, a co-author of the report, co-chair of GCP and a professor in Earth system science at Stanford University. "That's a real concern."

"The global economy is picking up slowly. As GDP rises, we produce more goods, which, by design, produces more emissions."

Yet the team said that despite the growth in 2017, it is too early to say whether this is a one-off event on the way to a global peak in emissions, or the beginning of a new period with upward pressure on global emissions growth.

In the long term, emissions are unlikely to return to the persistent high growth rates seen during the 2000s of over 3% per year. It is more likely that emissions will plateau or have slight positive growth, broadly in line with national emission pledges submitted to the Paris Agreement.

The 2017 carbon budget at a glance

- Global carbon dioxide emissions from all human activities ([fossil fuels](#), industry and land-use change) will reach around 41 billion tonnes carbon dioxide in 2017.
- Global carbon dioxide emissions from fossil fuels and industry will reach around 37 billion tonnes carbon dioxide in 2017.
- In 2017, carbon dioxide emissions from fossil fuels and industry are projected to grow by 2% (0.8% to 3%). This follows three years of nearly no growth (2014-2016) (GDP to rise 3.6% according to figures from the International Monetary Fund).
- Chinese emissions are projected to rise 3.5% (+0.7 to +5.4%) in 2017 (GDP up about 6.8%).
- U.S. emissions are projected to decline 0.4% (-2.7% to +1.9%) in 2017, lower than the decline of 1.2% per year averaged over the previous decade, with an unexpected rise in coal consumption

(GDP up about 2.2% in 2017).

- Indian emissions are projected to grow 2% (+0.2% to +3.8%) in 2017, compared to 6% per year averaged over the previous decade, due to significant government interventions in the economy (GDP up 6.7%).
- European emissions are tentatively expected to decline by 0.2% (-2% to +1.6%) in 2017, lower than the decline of 2.2% per year averaged over the previous decade (GDP up about 2.3%).
- The remaining countries' emissions, representing about 40% of the global total, are expected to increase around 2.3% (+0.5% to +4%) in 2017.

Renewable energy has increased rapidly at 14% per year over the last five years - albeit from a low base.

The Global Carbon Budget is produced by 76 scientists from 57 research institutions in 15 countries working under the umbrella of the Global Carbon Project (GCP). The budget, now in its 12th year, provides an in-depth look at the amount of fossil fuels that nations around the world burn and where it ends up.

GCP is sponsored by Future Earth and the World Climate Research Programme.

Future Earth's executive director Amy Luers said, "This year's carbon budget news is a step back for humankind."

"We must reverse this trend and start to accelerate toward a safe and prosperous world for all. This means prioritising providing access to clean reliable energy to the hundreds of millions of people across the world without access to what many of us take for granted every day - electricity. Fortunately, now it is not only possible, but in most cases makes simple financial sense, to meet these electricity needs with

renewable energy sources."

Emissions decreasing in 22 countries

There was also some good news in the report: In the last decade (2007-2016), emissions in 22 countries (representing 20% of global emissions) decreased even as their economies grew. Technologies like wind and solar power have expanded across the globe by about 14% annually in recent years, according to the report.

Jackson said that he's "cautiously optimistic" that the transition from fossil fuel burning to renewable energy will continue in the United States - even as the Trump administration rolls back policies aimed at tackling the nation's [greenhouse gas emissions](#).

"The federal government can slow the development of renewables and low-carbon technologies, but it can't stop it," Jackson said. "That transition is being driven by the low cost of new renewable infrastructure, and it's being driven by new consumer preferences."

However, in 101 countries (representing 50% of global emissions) emissions increased in the presence of growing GDP.

Persistent uncertainties

Persistent uncertainties exist in scientists' ability to estimate recent changes in emissions, particularly when there are unexpected changes as in the last few years.

"When there are unexpected changes in carbon dioxide emissions or atmospheric concentrations, there are questions raised about our ability to independently verify reported emissions," Peters said.

Even though researchers may start to detect a change in [emission](#) trends early, it may take as much as 10 years to confidently and independently verify a sustained change in emissions using measurements of atmospheric concentrations of [carbon](#) dioxide.

"The Global Stocktake under the Paris Agreement will occur every five years, and this puts immense pressure on the scientific community to develop methods and perform measurements that can truly verify changes in emissions within this five-yearly cycle," Le Quéré said.

More information: Glen P. Peters et al, Towards real-time verification of CO₂ emissions, *Nature Climate Change* (2017). [DOI: 10.1038/s41558-017-0013-9](https://doi.org/10.1038/s41558-017-0013-9)

Le Quéré et al. (2017) Global Carbon Budget 2017. *Earth System Science Data Discussions*. doi.org/10.5194/essdd-2017-123

Jackson et al. (2017) Warning signs for stabilizing global CO₂ emissions, *Environmental Research Letters*. doi.org/10.1088/1748-9326/aa9662

Data and figures: www.globalcarbonproject.org/carbonbudget

Data interface for exploring data: www.globalcarbonatlas.org

Provided by Future Earth

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