

Global CO₂ emissions likely to rise in 2017

Global carbon dioxide emissions were almost flat for three years (2014-2016) bringing much needed optimism, but emissions are expected to increase in 2017.

Today the Global Carbon Project (GCP) publishes its annual analysis of trends in the global carbon cycle, highlighting how precarious the recent slowdown in global emissions growth is.

The growth in 2017 is predominantly due to stronger emissions growth in China and other developing countries, and the findings highlight that the Paris goals could quickly slip out of reach without concerted efforts to drive emissions down.

The GCP is releasing a package of three papers in the journals *Nature Climate Change* (verification), *Environmental Research Letters* (recent trends), and *Earth System Science Data Discussions* (the full carbon cycle).

Global carbon dioxide emissions from fossil fuels and industry grew at over 3% per year in the 2000's, but growth has slowed in the 2010's, and in the last three years (2014-2016) emissions remained flat.

"The slowdown in emissions growth from 2014 to 2016 was always a delicate balance, and the likely 2% increase in 2017 clearly demonstrates that we can't take the recent slowdown for granted", said Robbie Andrew, a senior researcher at CICERO Center for International Climate Research in Oslo and co-author of the studies.

Even though we project carbon dioxide emissions from fossil fuels and industry to increase 2% in 2017, large uncertainties persist and growth between 1% and 3% are distinct possibilities given difficulties in making projections.

"Global commitments made in Paris in 2015 to reduce emissions are still not being matched by actions," said Glen Peters, a research director at CICERO who led one of the studies. "It is far too early to proclaim that we have turned a corner and started the journey towards zero emissions".

While emissions may rise 2% in 2017, it is not possible to say whether this is a return to growth, or a one-off increase.

The signature of Chinese emissions

China, which drove the unexpected and rapid growth in the 2000's and was behind the unexpected recent slowdown in emissions growth, is again a key driver in the 2017 increase in emissions.

"China generates nearly 30% of global carbon dioxide emissions, and the ups and downs of the Chinese economy leave a signature on global emissions growth" said Jan Ivar Korsbakken, senior researcher at CICERO and co-author.

Chinese emissions went down about 1% in 2015 and were flat in 2016, but are projected to increase between 0.7% to 5.4% in 2017, with a best estimate using preliminary data of 3.5% in 2017.

"Chinese energy statistics have been plagued by many inconsistencies, particularly when projecting emissions for the current year", said Korsbakken. "We do not know if the increase in emissions in 2017 is a one-off, or represents changes leading to more sustained upward pressure on emissions in the years ahead".

An emissions tug-of-war

“There is a diversity of countries in the world, and at any time some countries have declining emissions and others increasing emissions, with changes in the global total representing a balance of these opposing forces”, said Peters.

In 2017, we project the following changes in emissions (with uncertainty ranges in brackets, and GDP from the IMF):

- Chinese emissions are projected to rise 3.5% (+0.7 to +5.4%) in 2017 (GDP up about 6.8% in 2017);
- US emissions are projected to decline 0.4% (-2.7% to +1.9%) in 2017, slower than the decline of 1.2% per year averaged over the previous decade, with a return to growth in coal use (GDP up about 2.2% in 2017);
- Indian emissions are projected to rise 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, slower than the decline of 2.2% per year averaged over the previous decade (GDP up about 2.3%).
- Emissions in the remaining countries, representing about 40% of the global total, are expected to increase 2.3% (+0.5% to +4%) in 2017.

Global carbon dioxide emissions from fossil fuels and industry will reach around 37 billion tonnes carbon dioxide in 2017, a record high. 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, similar to the record high in 2015.

Continued growth in atmospheric concentrations

Carbon dioxide concentrations in the atmosphere grew at the strongest levels recorded in 2015 and 2016 due to sustained high emissions combined with the strong El Niño event experienced from late 2015 to early 2016.

Concentrations are expected to grow 2.5 parts per million in 2017, higher than the growth rate over the last decade.

“The 2015/2016 El Niño caused hot and dry conditions in the tropics that reduced the uptake of carbon by forests and led to a record rise in atmospheric carbon dioxide concentrations”, said Prof Corinne Le Quéré, Director of the Tyndall Centre at the University of East Anglia, who led the main analysis. “Even though emissions grew in 2017, we expect a lower growth in atmospheric concentration than in 2016 as the El Niño has now finished”.

Persistent uncertainties

Persistent uncertainties exist in our 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”, said Peters.

Even though we may start to detect a change in emission trend 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.

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“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”, said Prof Corinne Le Quéré.

EDITOR’S NOTES

1/ INTERVIEWS

- Glen Peters (glen.peters@cicero.oslo.no, [@Peters_Glen](https://twitter.com/Peters_Glen), +47 9289 1638)
- Corinne Le Quéré (communications@uea.ac.uk, +44 (0) 1603 592764)

2/ SOCIAL MEDIA

- Twitter: Glen Peters ([@Peters_Glen](https://twitter.com/Peters_Glen)), [@gcarbonproject](https://twitter.com/gcarbonproject), [#carbonbudget](https://twitter.com/carbonbudget)
- Facebook: <https://www.facebook.com/globalcarbonproject>

3/ PRESS CONFERENCE – COP23 BONN

- Monday 13 November 9:30 to 10:00, Bula Zone – Bula 3 - Press Conference Room 2 •
The panel will include Prof Corinne Le Quéré, Dr Glen Peters, and Owen Gaffney (chair).
- The focus of this event will be for media questions – therefore please do familiarise yourself with the paper and press materials ahead of time.

4/ SIDE-EVENT – COP23 BONN

- Monday 13 Nov 15:00-16:15 Bonn Zone –WWF Pavilion (64 seats), “The Global Carbon Budget 2017” •
The panel includes Prof Corinne Le Quéré, Dr Glen Peters, Prof Kevin Anderson, & Dr Youba Sokona (chair).

5/ ADDITIONAL MATERIAL (NOTE EMBARGO)

This media release is part of the Global Carbon Budget 2017, the annual update by the Global Carbon Project. It is based on the analyses published here:

- **Prior to embargo:** A media package can be requested via communications@uea.ac.uk
- **After embargo:** All material available from: <http://www.globalcarbonproject.org/carbonbudget>
- Le Quéré et al (2017) Global Carbon Budget 2017. *Earth System Science Data Discussions*, <https://doi.org/10.5194/essd-2017-123>
- Peters et al (2017), Towards real-time verification of CO₂ emissions, *Nature Climate Change*, <https://doi.org/10.1038/s41558-017-0013-9> (available at press@nature.com prior to the embargo)
- Jackson et al (2017), Warning signs for stabilizing global CO₂ emissions, *Environmental Research Letters*, <https://doi.org/10.1088/1748-9326/aa9662>
- Data interface for exploring data: <http://www.globalcarbonatlas.org>

6/ FUNDING DISCLOSURE

- Contributors to the Global Carbon Budget 2017 are funded by research organisations and government departments in multiple countries and supported by their organisations
- The Global Carbon Atlas is partly funded by the BNP Paribas Climate Philanthropy
- A full list of funders is provided in Table B1 of the *Earth System Science Data Discussions* paper

7/ The Global Carbon Project was established in 2001 in recognition of the large scientific challenges and critical nature of the carbon cycle for Earth's sustainability. The scientific goal of the project is to develop a complete picture of the global carbon cycle, including both its biophysical and human dimensions together with the interactions and feedbacks between them. It is a global research project within the Future Earth research initiative on global

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sustainability (www.futureearth.org). The Global Carbon Budget 2017 is the 12th edition of the annual update that started in 2006.