

Lockdowns trigger dramatic fall in global carbon emissions

Responses to coronavirus crisis cause sharpest drop in carbon output since records began

Steep fall in emissions during coronavirus is no cause for celebration

Coronavirus – latest updates

See all our coronavirus coverage

Fiona Harvey *Environment correspondent*

Tue 19 May 2020 16.00 BST

Last modified on Tue 19 May 2020 18.20 BST

<https://www.theguardian.com/environment/2020/may/19/lockdowns-trigger-dramatic-fall-global-carbon-emissions>



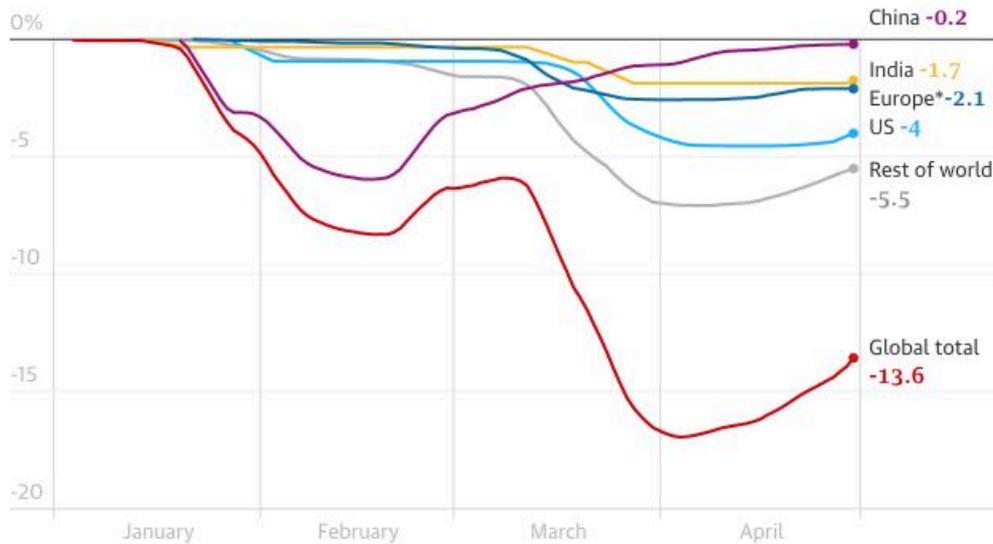
Snow seen on the San Gabriel mountains beyond Los Angeles last month as southern California experiences improved air quality during the coronavirus lockdown. Photograph: David McNew/Getty Images

Carbon dioxide emissions have fallen dramatically since lockdowns were imposed around the world due to the coronavirus crisis, research has shown.

Daily emissions of the greenhouse gas plunged 17% by early April compared with 2019 levels, according to the first definitive study of global carbon output this year.

The findings show the world has experienced the sharpest drop in carbon output since records began, with large sections of the global economy brought to a near standstill. When the lockdown was at its most stringent, in some countries emissions fell by just over a quarter (26%) on average. In the UK, the decline was about 31%, while in Australia emissions fell 28.3% for a period during April.

Daily global fossil CO2 emissions fell by 17% in early April 2020 compared with 2019



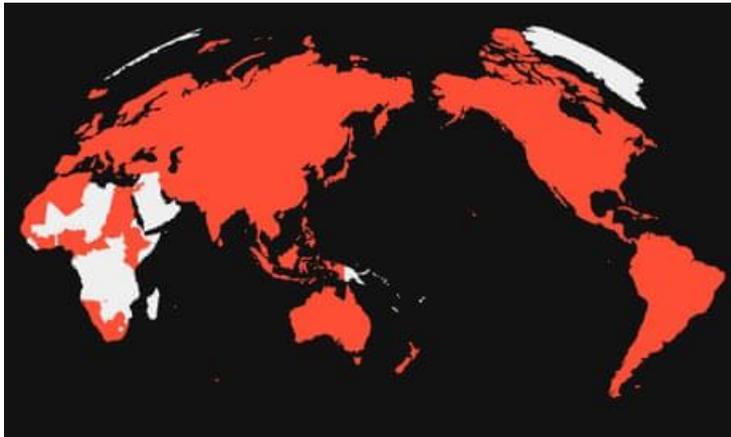
Guardian graphic. Source: Nature Climate Change. Note: Europe = EU27 plus UK

“This is a really big fall, but at the same time, 83% of global emissions are left, which shows how difficult it is to reduce emissions with changes in behaviour,” said Corinne Le Quéré, a professor of climate change at the University of East Anglia, and lead author of the study published in the journal *Nature Climate Change*. “And it is not desirable – this is not the way to tackle climate change.”

The unprecedented fall is likely to be only temporary. As countries slowly get back to normal activity, over the course of the year the annual decline is likely to be only about 7%, if some restrictions to halt the virus remain in place. However, if they are lifted in mid-June the fall for the year is likely to be only 4%.

That would still represent the **biggest annual drop in emissions** since the second world war, and a stark difference compared with recent trends, as **emissions have been rising** by about 1% annually. But it would make “a negligible impact on the Paris agreement” goals, Le Quéré said.

Emissions must fall to net zero by mid-century or soon after to meet the goals of the Paris agreement and keep global heating from reaching catastrophic levels, according to the Intergovernmental Panel on Climate Change. The fall in carbon resulting from the Covid-19 crisis reveals how far the world still has to go, said Le Quéré.



Coronavirus world map: which countries have the most cases and deaths?

[Read more](#)

The experience of the crisis so far has shown that changes in behaviour by individuals – such as **not flying**, **working from home** and **driving less** – can only go part of the way needed to cut emissions, as even the lockdown measures left the bulk of emission sources intact, she said, adding that bigger shifts are needed to the way people produce and use energy.

“Just behavioural change is not enough,” she said. “We need structural changes [to the economy and industry]. But if we take this opportunity to put structural changes in place, we have now seen what it is possible to achieve.”

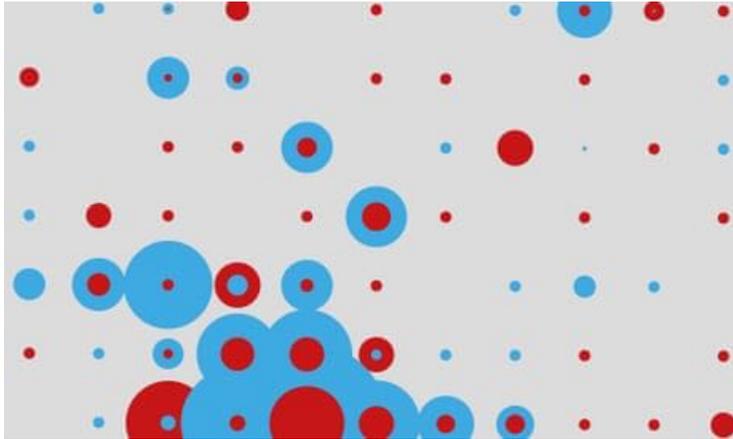
Emissions from aviation showed a dramatic decline, of about 60%, as international flights between many countries were grounded. Emissions from surface transport fell less sharply, by about 36%. Power generation and industry accounted for about 86% of the total

decline in emissions.

Despite such an unprecedented fall, the impacts on the climate are likely to be small. **Stocks of carbon dioxide in the atmosphere**, which reached 414.8 parts per million last year, will rise further towards the **danger threshold of 450ppm** this year, though perhaps at a slightly slower pace.

“Carbon dioxide stays in the air a long time, so although emissions are smaller, they are still happening and so carbon dioxide is still building up, just a little more slowly,” said Richard Betts, the head of climate impacts research at the Met Office Hadley Centre, who was not involved in the paper. “If we want to halt the build-up of carbon dioxide in the atmosphere, we need to stop putting it there altogether. It’s like we’re filling a bath and have turned down the tap slightly, but not turned it off.”

The lockdowns have caused steep falls in energy demand, but energy production has hardly been changed by the crisis, noted Mark Maslin, a professor of climatology at University College London, who was also not involved in the paper.



Coronavirus: the week explained - sign up for our email newsletter

[Read more](#)

“The real lesson of this pandemic is that we must globally shift our **energy production away from fossil fuels** as quickly as possible if we are to ensure sustained year-on-year cuts to our global emissions,” he said. “The good news is that both of these will help to maintain the clean air and clear skies we have all rediscovered during lockdown, saving many lives.”

The comprehensive analysis was conducted by scientists from the University of East Anglia, Stanford University in the US, the Cicero Centre in Norway, as well as scientists in the Netherlands, Australia, France and Germany.

The researchers used measurements of economic activity, energy generation, industrial production, transport and other proxies to estimate carbon dioxide output. They concentrated their analysis on six areas: power generation, surface transport, industry, public buildings and commerce, residential sources, and aviation. Estimates were taken from 69 countries, 50 US states and 30 Chinese provinces, representing 97% of global carbon emissions.

Although the rising concentrations of carbon in the atmosphere are regularly measured, they are subject to large natural fluctuations so are unsuitable to the kind of snapshot analysis required to observe what is happening to global carbon output over a relatively short period.