

Climate scientists hail 2023 as ‘beginning of the end’ for fossil fuel era

Cautious optimism among experts that emissions from energy use may have peaked as net zero mission intensifies

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- Fossil fuel emissions from gas, oil and coal plants will have peaked by 2030, according to the International Energy Agency. Photograph: Alexisaj/Alamy

Global efforts to slow a runaway climate catastrophe may have reached a critical milestone in the last year with the peak of global carbon emissions from energy use, according to experts.

A growing number of climate analysts believe that 2023 may be recorded as the year in which annual emissions reached a pinnacle before the global fossil fuel economy begins a terminal decline.

The milestone is considered a crucial tipping point in the race to drive emissions to net zero. But for many climate experts it's an inflexion point that was due years ago and which, although encouraging, falls far short of the rapid reduction the world needs.

The world's leading climate scientists have consistently warned that the buildup of carbon dioxide in the Earth's atmosphere means it is critical to drive down emissions before 2030 if leaders hope to keep global heating to a maximum of 1.5C above pre-industrialised levels. The rate at which emissions would need to be reduced will require, most experts agree, global transformation on a scale not yet in the pipeline.

“We can take a small pause to celebrate this tipping point,” said Dave Jones, a director at the climate thinktank Ember. “But in a way it's worrying that we are still talking about when emissions might peak. The reality of the situation is that we need deep and fast reductions in emissions if we hope to stay within the vanishingly small budget for carbon which remains.”

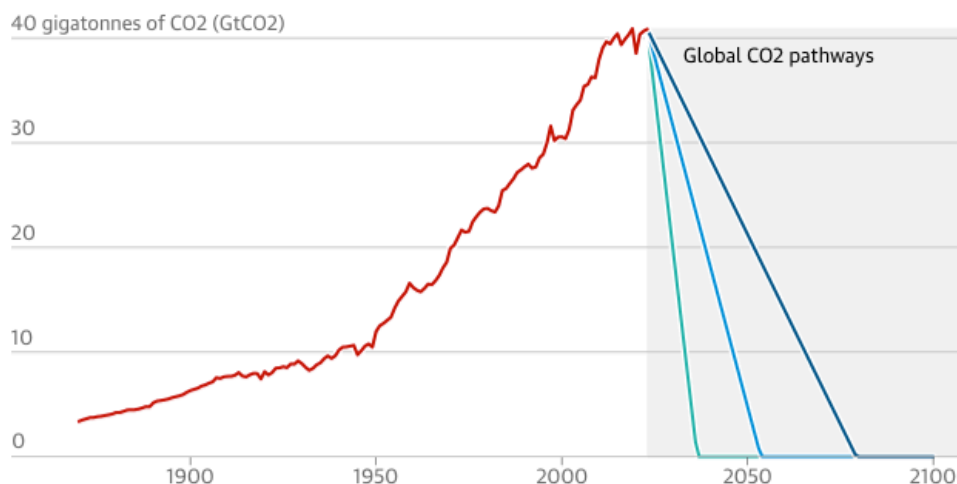
The International Energy Agency (IEA) raised hopes earlier this year of an end to the fossil fuel era when it predicted for the first time that the consumption of oil, gas and coal would peak before 2030 and begin to fall as climate policies took effect.

“It's not a question of 'if', it's just a matter of 'how soon' – and the sooner the better for all of us,” said Fatih Birol, the head of the IEA.

Keeping warming below 1.5C would require reaching net zero CO2 emissions before 2040

Global CO2 pathways to stay within various levels of warming, based on remaining carbon budgets

■ Historical ■ 1.5C (275 GtCO2) ■ 1.7C (625 GtCO2) ■ 2.0C (1,150 GtCO2)



Guardian graphic. Source: Global Carbon Project. Note: Global Carbon Project analysis of remaining carbon budgets defined in the Intergovernmental Panel on Climate Change's Sixth Assessment report

To understand how the world may have already reached an end to rising global emissions, just two years after one of the steepest emissions hikes in history, it helps to look at the global electricity sector.

“The world is teetering at the peak of power sector emissions,” said Malgorzata Wiatros-Motyka, the lead author of a report by Ember. Earlier this year the report found that emissions from generating electricity had plateaued over the first half of 2023 and could be poised to fall from next year.

The report studied power generation across 78 countries representing 92% of global electricity demand. It found a 16% rise in the amount of solar power generated and a 10% jump in global wind power output.

In the IEA’s flagship report, widely considered to be one of the most influential in the climate and energy debate, it found that the steady rise of wind and solar power was on track to outpace the world’s growing demand for energy – meaning renewables will start to displace fossil fuels on a global scale.



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At the same time the rollout of electric vehicles globally is expected to start eroding the demand for road fuels, which makes up about 50% of the oil demand in developed countries.

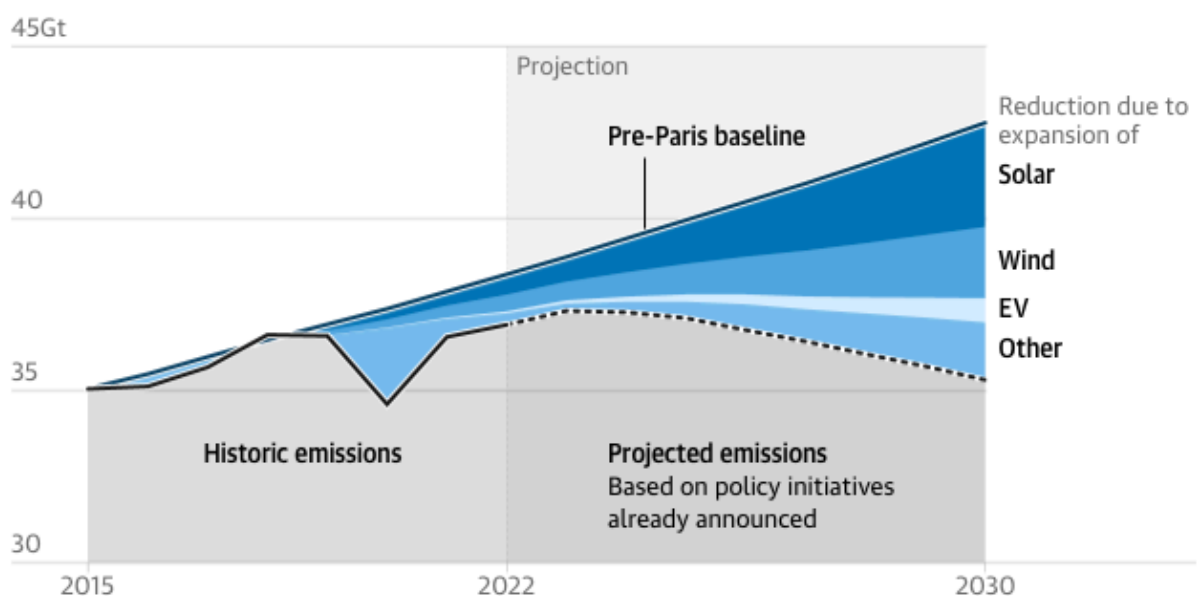
These trends have accelerated since Russia’s invasion of Ukraine, which triggered a surge in the commodity price for gas and oil in 2022 and incentivised a renewed focus on securing domestic sources of clean energy instead.

In one scenario put forward by the IEA, based on the stated policies of global governments, it found that emissions may peak as soon as this year before beginning a slow decline. The IEA is careful to say that none of its scenarios should be considered a forecast. The “stated policies” scenario is one of the more reliable barometers of what the future may hold because it is based on “a detailed review of the current policy landscape”, or in other words, what governments are doing rather than what they are say they will do.

The findings are backed up by a number of separate studies, all from well-regarded energy authorities, which paint a picture of a world at the beginning of the end of the fossil fuel era.

Clean energy expansion is improving the outlook for CO2 emissions

Projected global energy sector emissions relative to the pre-Paris baseline scenario, Gt CO2



Guardian graphic. Source: IEA. World Energy Outlook. Note: 'Other' includes all other levers with downward or upward effects on the emissions difference between the pre-Paris baseline scenario and the 2023 stated energy policies scenario projections. 1Gt = 1 billion tonnes

An analysis of China’s carbon emissions – the highest in the world and more than the emissions of the US, India and Russia combined – found that they may

reach a peak this year before falling into a structural decline by 2024. The study by the Centre for Research on Energy and Clean Air, undertaken for Carbon Brief, found that China's rollout of wind and solar power had been faster than expected this year and could eclipse the country's growing energy appetite.

A peak in China's emissions this year was also found by Climate Analytics, a climate policy institute, which predicted that an emissions peak for the world's most energy-hungry nation could drive the world to an emissions "tipping point" in 2023.

Dr Neil Grant, an author of the report, said: "For years, energy demand growth has outstripped renewables deployment, despite record additions of wind and solar. We're now approaching the tipping point, where renewables overtake demand growth and start displacing coal, oil and gas. This would mark the beginning of the end for the fossil economy."

There is a note of caution in the prediction though. Claire Fyson, another author of the Climate Analytics report, warned that the existing trends seeing rising renewables and electric motoring would need to continue to allow emissions to begin falling.

"This won't just happen by itself," Fyson said. "Technologies often follow an 'S' curve where they really take off but over time their progress can slow. You need government policy to continue to incentivise renewables and [disincentivise] fossil fuels."



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Not everyone agrees that fossil fuels have reached the beginning of the end. Some of the biggest oil producers in the world have publicly stated that oil demand – and emissions – show no sign of falling.

The US Energy Information Administration's (EIA) said earlier this year that energy-related carbon emissions would continue to rise, in line with growing global demand for oil, until 2050. The Organization of the Petroleum Exporting Countries (Opec) has also predicted that global oil demand will continue to grow out to 2045, albeit at a slower pace than in recent years.

“I think you have to think about the motives behind these projects,” said Fyson. “It’s in Opec’s best interest to forecast a rise in oil demand.”

Strong oil demand forecasts can create a self-fulfilling prophecy. They might encourage governments to back further oil and gas exploration to avoid a shortfall, which in turn can lead to lower oil commodity prices if there is more oil and gas than needed. This creates a disincentive to switch from a fossil fuel vehicle or heating system to an electric alternative if it’s cheaper to use gas or oil.

Opec has consistently underestimated the rollout of electric vehicles in its official forecasts, which are used by governments to inform their policies, according to experts. Its forecasts for the number of electric vehicles on the roads by 2022 were too low by an average of almost 60% over the period

2015-2021, according to a recent report by Zero Carbon Analytics. In 2021, the cartel's forecasts for the global electric vehicles fleet just one year ahead were wrong by 49%, the report found.

Amy Kong, the author of the report, said the forecasts were “wildly wrong year after year” in what appears to be an “underhand attempt by oil producers to persuade investors and governments that fossil fuels have a future”.

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Even in a world of declining fossil fuels and carbon emissions there is a clear risk of failing to move fast enough to reduce emissions in time to prevent global heating of 1.5C above pre-industrialised levels, according to climate experts.

The United Nations Environment Programme estimates that for the world to have a shot at keeping global heating below the 1.5C target set out in the Paris agreement emissions will need to fall by about 9% every year. For context, emissions fell 5.4% when the Covid-19 pandemic brought global economies to a standstill in 2020 before starting to rise again.

There will need to be great strides in addressing the world's record high carbon emissions, but from next year there's a strong chance that at least they will be moving in the right direction.