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Headline: 2020: Lowest carbon emissions, hottest year?

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Global carbon emissions declined at record rates in 2020, and yet that same year was the hottest year on record (tied with 2016). If carbon emission is the chief culprit behind global warming, how did this happen?

The decline in greenhouse gas (GHG) emissions in 2020 was the steepest since World War II because of pandemic-related restrictions. In the first half of the year, when most countries imposed some form of lockdown, carbon emissions contracted by almost 9 percent relative to the year before, according to Liu and co-workers (2020) in their paper in "Nature Communications." Consistent with this, Friedlingstein and co-writers (2020), in their article in "Earth Systems Science Data," estimated that fossil fuel carbon emissions shrank by 7 percent in the whole of 2020.

So why was it scorching hot in 2020? The main reason is that much of the carbon dioxide gases that have been emitted in the past century are still in our atmosphere. Carbon dioxide molecules can last in the atmosphere for hundreds of years. In 2020, carbon dioxide concentration averaged 409 ppm, much higher than in the 1850s (less than 300 ppm) when the use of fossil fuels began.

The disturbing implication of the long residence time of carbon dioxide in the atmosphere is that even if we stop emitting GHG, our planet will continue to warm in the decades ahead. And if we don't radically control GHG emissions, then the warming trend will accelerate.

Given the above, it is therefore not surprising that the planet warmed at record levels in the past year despite a decline in carbon emissions. Worse, as the pandemic wanes with vaccines becoming available widely, scientists are expecting a rebound in GHG emissions, negating any temporary gains.

The UN-sponsored Paris Agreement calls for capping temperature rise to no more than 2 degrees Celsius. For this to happen, a United Nations Environmental Programme report, released just before the pandemic hit, showed the world needs to reduce GHG emissions by 7.6 percent every year from 2020 to 2031. Quite amazingly, we achieved this target in 2020, but not in the way anyone could have wished or foreseen.

No one in their right mind would want the pandemic to persist simply to keep GHG emissions down. But there are lessons we can learn from what happened. For one, we saw that given the right incentive, the global community could change, both at the national and individual levels. This change offers some hope. If our leaders and people take climate change seriously, we can find ways to reduce our GHG emissions dramatically.

Building back after the pandemic offers another window of opportunity to address longstanding problems. Massive investments will be poured to recover from the ill-effects of COVID-19. Such strategies that respond to and prevent future pandemics must be tied to broader resilience strategies, which should focus heavily on investments in "greening" the economy. These include shifting to cleaner energy sources and investing in nature-based solutions such as forests and mangroves.

Not a few people want to forget the year 2020. That may be understandable, but let us not forget its lessons. The hottest year may turn out to be the wake-up call we need to cool down our planet.

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