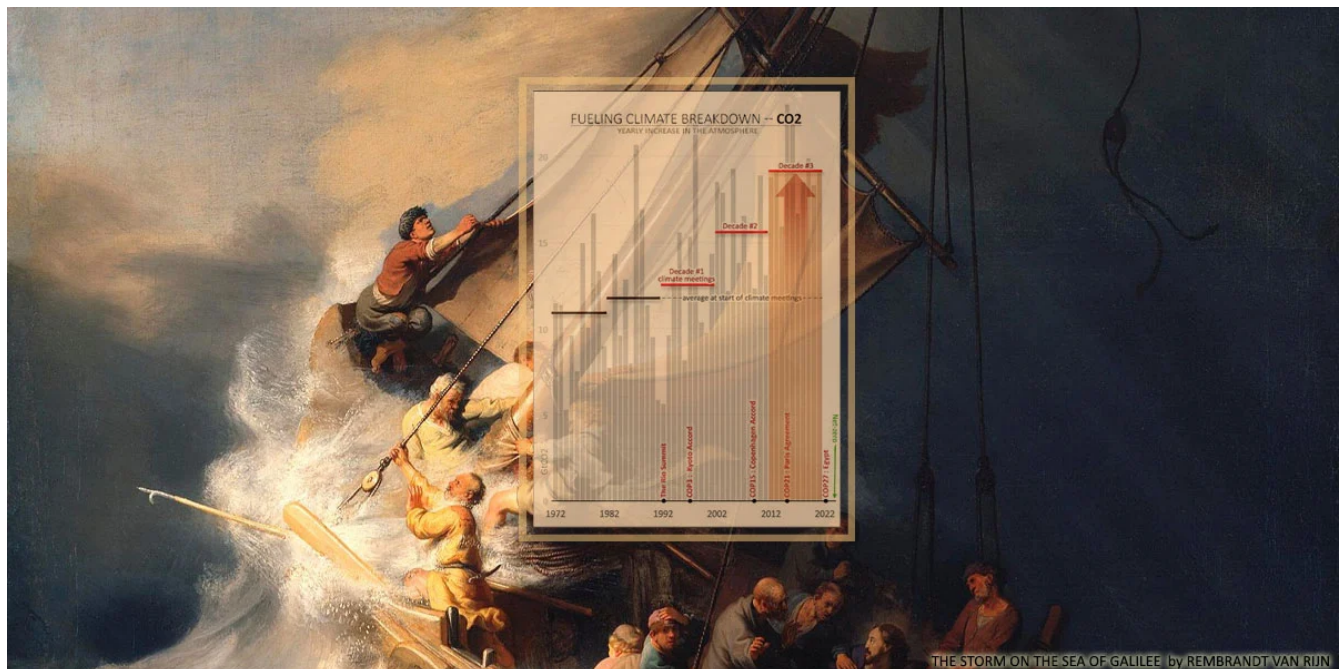


Climate progress? Someone forgot to tell the atmosphere

By Barry Saxifrage | Analysis, Climate Solutions Reporting | November 9th 2022

#11 of 11 articles from the Special Report: **Negotiating survival**



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The world's nations are gathering in Egypt this week to embark on their fourth decade of global climate meetings. The results from the first three decades — on the only scoreboard the climate pays attention to, the atmosphere — have been increasingly disastrous.

Atmospheric levels of all three major greenhouse gases — carbon dioxide, methane and nitrous oxide — are rocketing upwards, unchecked. Combined, they cause 90 per cent of global heating.

Here's a climate-eye's view of where we are today globally, and in Canada.

CO2 accelerating upwards

“The accumulation of CO2 in the atmosphere is irreversible on human timescales and will affect climate for millennia.” — World Meteorological Organization (WMO)

The rapid rise of CO2 in our atmosphere is the primary driver of the climate crisis and ocean acidification. Both crises will continue to grow more dangerous until CO2 levels stop rising. That point is called “net-zero” and it is literally the zero line at the bottom of my first chart below.

What people are reading



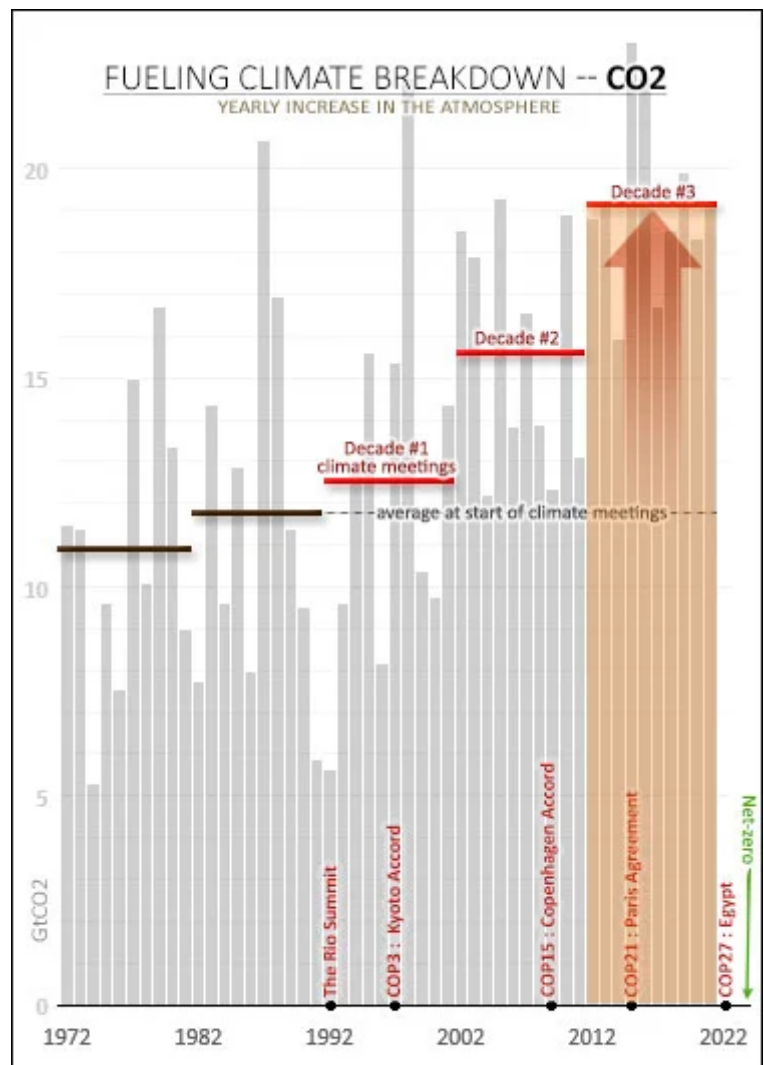
Trudeau government takes first steps to cement its cornerstone climate policy

The chart's vertical grey bars show the CO₂ increases for each of the last 50 years. And the horizontal bars show the average for each decade.

As you can quickly see, CO₂ increases haven't fallen towards zero as required for a stable and safe climate. Instead, CO₂ levels have *accelerated* upwards, decade after decade.

And notice that the most extreme CO₂ acceleration happened in the most recent decade. That record surge happened despite the marquee Paris Agreement and a global pandemic shutdown.

Global climate meetings started back in 1992, with the Rio Summit. Since then, the atmosphere has gained 475 billion tonnes of CO₂ (GtCO₂). For scale, that's eight times the weight of *all the solid waste trash* humanity threw out over those years. It's the equivalent of every human on Earth littering hundreds of *fistfuls of plastic straws* every single day during those 30 years.



FIFTY YEARS OF ATMOSPHERIC CO₂ INCREASES -- Grey vertical bars show annual increases in atmospheric CO₂. Black and red horizontal bars show decade averages. Values are in billions of tonnes of CO₂ (GtCO₂) calculated using 7.81 GtCO₂/ppm. Data source: Ed Diugokencky and Pieter Tans, NOAA/GML (gml.noaa.gov/ccgg/trends/). Chart by Barry Saxifrage at NationalObserver.com and VisualCarbon.org. Nov 2022.

Not only is CO2 humanity's largest garbage stream, but it will take more than **100,000 years** for the planet to remove all the extra CO2 we've piled up in the atmosphere.

That relatively calm and temperate climate many of us adults got to enjoy growing up — the one that human civilization blossomed under — is now gone. Cooked away. What we are collectively deciding, day by day going forward, is just how much more extreme we are going to **crank up the climate misery**.

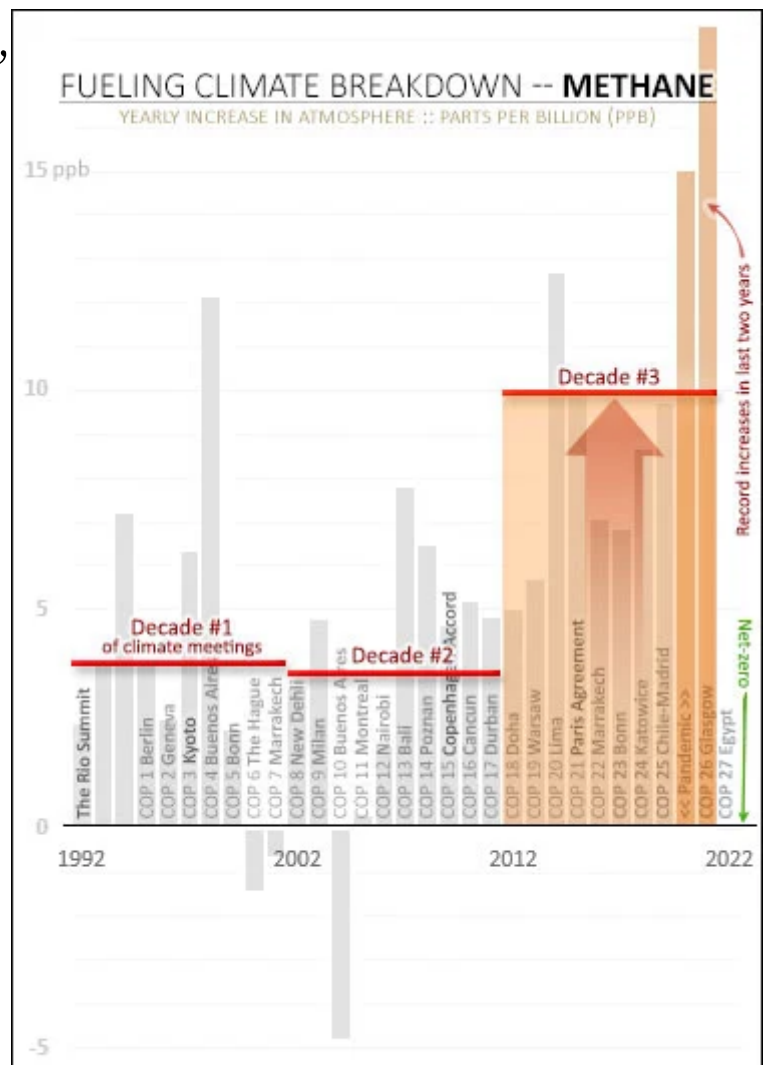
Methane also surging

The second-biggest driver of climate change is the rise of methane (CH₄) in our atmosphere.

As my second chart shows, methane has also been surging at record rates. And here, too, the most recent decade has been the most extreme on record.

In fact, more methane piled up in the atmosphere over the last decade than during the two previous decades combined.

And, troublingly, the last two years have seen record-breaking spikes.



THIRTY YEARS OF ATMOSPHERIC CH₄ INCREASES -- Grey vertical bars show annual increases in atmospheric CH₄. Red horizontal bars show decade averages. Values are in parts per billion. Data source: Ed Dlugokencky and Pieter Tans, NOAA/GML (gml.noaa.gov/ccg/trends/). Chart by Barry Saxifrage at NationalObserver.com and VisualCarbon.org. Nov 2022.

What's causing this dramatic surge in methane? Scientists still aren't certain.

According to the WMO's most recent [Greenhouse Gas Bulletin](#), the most likely driver seems to be a surge in emissions from biological processes, especially in tropical regions.

Potential sources for this include some that humans control, like rice fields and livestock. But there are other potential sources that are outside human control. One such possibility the WMO notes is that “microbial methane production in tropical wetlands is sensitive to shifting temperature and precipitation patterns, introducing a potential positive climate feedback.” Have we so shocked the climate system that this long-feared feedback loop has kicked in?

Maybe.

Nobody knows.

And, unfortunately for us, the climate doesn't care where methane comes from. It just reacts to the amount in the atmosphere. Getting to safety requires “net-zero” methane additions to the atmosphere.

Nitrous oxide is accelerating, as well

The third-largest driver of climate change is the rise of nitrous oxide (N₂O) in our atmosphere.

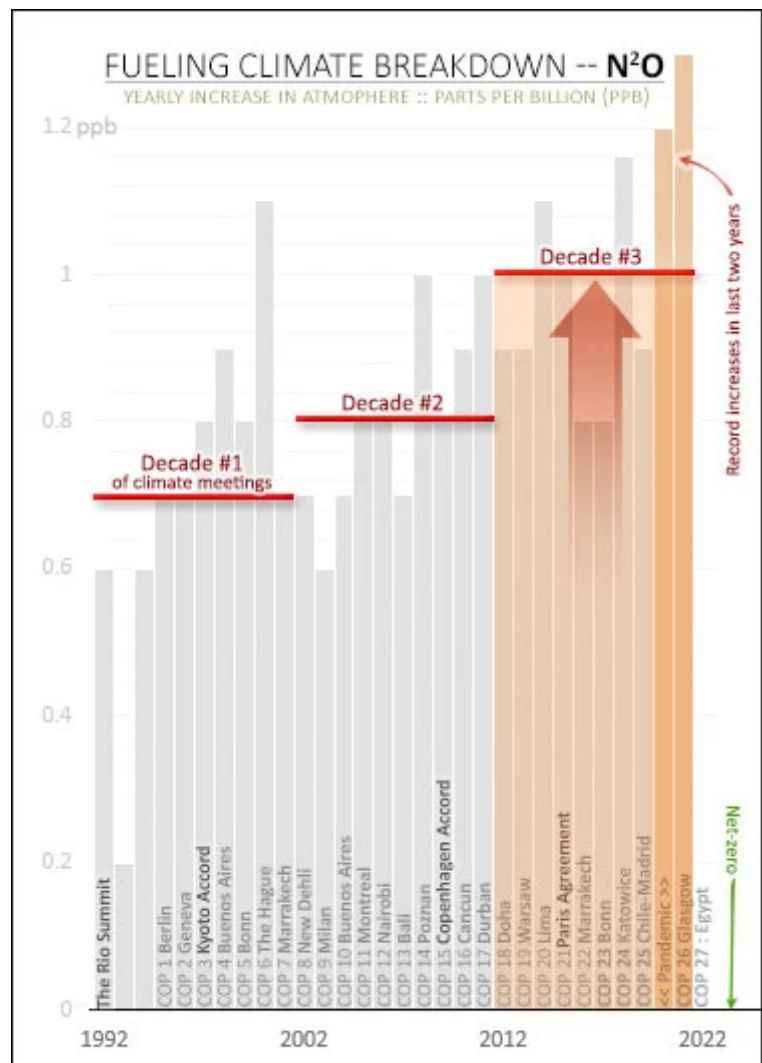
My third chart shows that nitrous oxide levels have also been accelerating upwards, decade after decade.

And again, as with CO₂ and methane, the most extreme increases happened in the most recent decade.

And, similarly to methane, the last two years have seen record-breaking surges.

In this case, scientists have a much better understanding of what's causing the rise in N₂O – the rising use of nitrogen fertilizer around the world.

Now that we've seen what's happening with these three greenhouse gases globally, let's take a look at Canadian emissions.



THIRTY YEARS OF ATMOSPHERIC N₂O INCREASES – Grey vertical bars show annual increases in atmospheric nitrous oxide. Red horizontal bars show decade averages. Values are in parts per billion. Data from World Meteorological Organization GHG Bulletin at gaw.kishou.go.jp/publications/global_mean_mole_fractions. Chart by Barry Saxifrage at NationalObserver.com and VisualCarbon.org. Nov 2022.

Canadian emissions vs. our peers

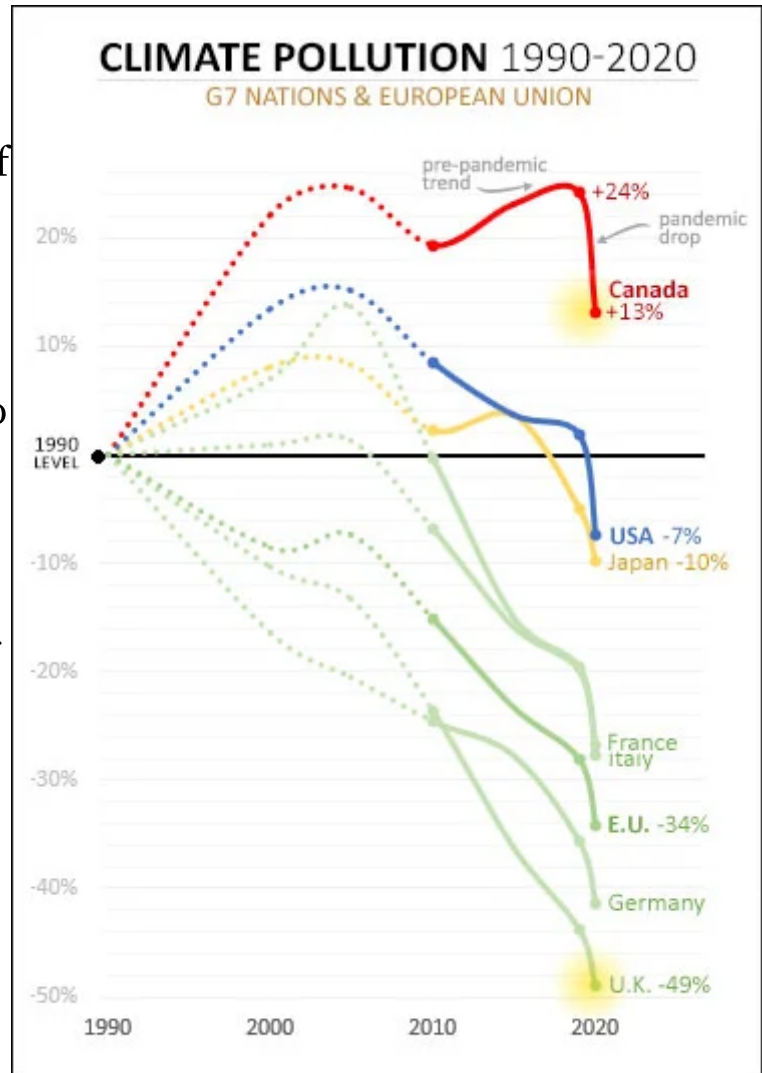
Canada, sadly, has the worst climate pollution record among our [Group of Seven \(G7\)](#) peers.

G7 members are the world's largest advanced economies, producing half of global GDP. These are the nations with the most resources, talent, technology and capacity to implement the required climate solutions.

Here's a quick overview of how Canada compares to our G7 peers on each of the three main greenhouse gases.

Carbon dioxide

Every G7 nation has managed to at least [lower their CO2 emissions](#) below 1990 levels — except Canada.



G7 EMISSIONS. Historical emissions data from UNFCCC National Inventory Reports for 2022. To better show trends the chart shows data for each 5 years starting in 1990 thru 2019 then shows the one year pandemic drop in 2020. CHART by Barry Saxifrage at VisualCarbon.org and NationalObserver.com. Nov 2022.

Leading the CO₂-cutting pack has been our Commonwealth peers, the British. They've nearly cut their CO₂ emissions in half. The European Union has collectively reduced its CO₂ pollution by a third. Heck, even the Americans have been reducing their emissions for decades now.

Canada, however, still emits far more CO₂ than we did back in 1990. And the gap with our G7 peers continues to grow wider. You can see this clearly on the chart above by looking at the trends during the last decade, before the temporary one-year pandemic drop in 2020. All the other nations were reducing emissions during the last decade, while Canada was [cranking ours still higher](#).

Methane

As *Bloomberg News* [recently reported](#), every G7 nation has also reduced methane emissions well below 1990 levels — except Canada. The Americans cut theirs by 25 per cent; the Germans and British by 50 per cent.

Canada's methane emissions are 37 per cent higher.

Nitrous oxide

[World Bank data](#) shows that all the G7 nations have also reduced their N₂O emissions below 1990 levels — except Canada and the U.S.

Canadian emissions are three per cent higher. But this understates our challenge. That's because Canada got a huge, one-time, nitrous oxide reduction in the late 1990s when our nation's only adipic acid factory closed. Surprisingly, that obscure factory shutdown remains Canada's [third-biggest greenhouse gas reduction](#) so far.

In the two decades since, however, Canadians' N₂O emissions have steadily risen. This has been driven by a doubling in nitrogen fertilizer use. This rising use of nitrogen fertilizer has now pushed Canada's N₂O emissions back up to our 1990 levels. Efforts to stop the rise of this greenhouse gas are now facing [pushback](#) from Canadian farm groups.

Canadian emissions vs. climate promises

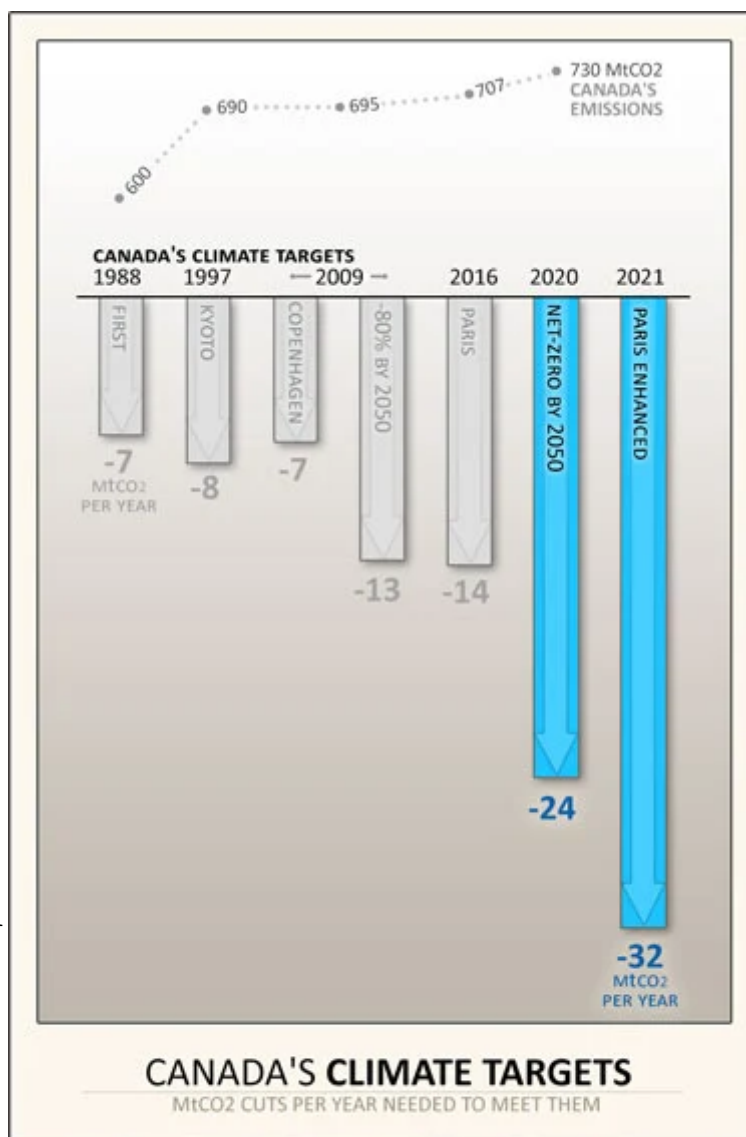
Canada has been promising to reduce our climate pollution for [34 years](#). Way back in 1988, the Mulroney government pledged to cut Canadian emissions 20 per cent by 2005. Instead, Canada increased emissions 25 per cent.

As a result, the task facing Canadians has grown ever larger while the time to do it in keeps shrinking. That's forced Canadian politicians across the political spectrum to commit to ever-steeper climate targets.

For example, our early targets – like the Chretien government's Kyoto target and the Harper government's Copenhagen target – required annual cuts of around seven MtCO2 per year.

Later targets – like the Harper government's Paris Agreement and 2050 targets – required cutting twice as much each year.

And then, after years more of rising emissions, Canada's latest targets – the Trudeau government's "net-zero" and enhanced Paris targets – now require cutting four times more per year than our first targets did.



CANADA EMISSIONS AND MAJOR CLIMATE TARGETS – Historical emissions data from Canada's UNFCCC National Inventory Reports 2021. Bars show emissions cuts needed per year to meet Canada's major climate targets – based on the year the target was set. The years the targets were set are shown above the bars. Canada's emissions in each of those years is shown on the dotted line at the top. The exceptions are for 2020 and 2021 targets which use Canada's 2019 emissions because those are the most recent available when this chart was made. CHART by Barry Saxifrage at VisualCarbon.org and NationalObserver.com, March 2022.

And yet we still aren't cutting our emissions as required to stabilize the climate. Continuing to climb ever higher up the climate cliff as the climate storm clouds grow more ominous and threatening isn't going to end well for Canadians. Our window to turn around and start climbing down to safety is closing fast.

The fossil fuel COPs

Meanwhile, back in Egypt, the global climate conference — formally known as the 27th Conference of the Parties, or COP27 — is now being openly sponsored by fossil fuel companies. At last year's COP 26 in Scotland, the fossil fuel industry sent [500 delegates](#) — more than from any nation.

With the foxes swarming the hen house and all three of the major greenhouse gases accelerated upward unchecked, it's no wonder the younger generations have taken to the streets, sports stadiums and art galleries protesting. They're looking for some way to save themselves from the increasingly dystopian climate future that adults are locking them into. As David Attenborough [put it](#): *"We have let down the young generation, and they know it, and they are angry."*

In his opening speech at COP 27 on Monday, UN Secretary General António Guterres was **blunt** about the reckless path we are on: *"We are on a highway to climate hell with our foot on the accelerator... Our planet is fast approaching tipping points that will make climate chaos irreversible... We are in the fight of our lives and we are losing."*

It's long past the time for Canadians to join the fight, live up to our climate promises, and rapidly crank down our oversized climate pollution.

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